

The Graduate School Office of the Associate Vice President and Dean POB 115500 101A Grinter Hall Gainesville FL 32611-5500 352 392 6622 (Telephone)

December 15, 2022

MEMORANDUM

- TO: Parisa Rashidi Associate Professor, UF Term Professor Intelligent Critical Care Center
- FROM: Nicole LP Stedman Dean and Associate Provost Graduate School
- RE: #16105 create a Master of Science (M.S.) degree with a major in Artificial Intelligence Systems, Herbert Wertheim College of Engineering

The proposal from the Herbert Wertheim College of Engineering to create a Master of Science (M.S.) degree with a major in Artificial Intelligence Systems was approved at the December 15, 2022 Graduate Council meeting with an effective date of Fall 2023.

The following individuals and offices will be notified by a copy of this memorandum so that they can complete their processes to create the graduate degree:

cc: Gann Enholm, Patty Van Wert, Stacy Wallace, Francesca Tai, Graduate School Lee Morrison, University Curriculum Committee and Office of the University Registrar Cathy Lebo, Office of Institutional Planning and Research Toshi Nishida, Associate Dean, College of Engineering Laurie Bialosky, Assistant to the Faculty Senate Chair and UF Trustee

NS/ld

Request to Offer a New Degree Program

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Board of Governors, State University System of Florida **REQUEST TO OFFER A NEW DEGREE PROGRAM** In Accordance with BOG Regulation 8.011

(Please do not revise this proposal format without prior approval from Board staff)

University of Florida

Institution Submitting Proposal

Herbert Wertheim College of Engineering Name of College(s) or School(s)

Artificial Intelligence Academic Specialty or Field Fall 2023

Proposed Implementation Term

Engineering Education Name of Department(s)/Division(s)

Master of Science with a major in Artificial Intelligence Systems Complete Name of Degree

11.0102

Proposed CIP Code (2020 CIP)

The submission of this proposal constitutes a commitment by the university that, if the proposal is approved, the necessary financial resources and the criteria for establishing new programs have been met prior to the initiation of the program.

Date Approved by the University Board of Trustees	President's Signature	Date
Board of Trustees Chair's Signature Date	Provost's Signature	Date

PROJECTED ENROLLMENTS AND PROGRAM COSTS

Provide headcount (HC) and full-time equivalent (FTE) student estimates for Years 1 through 5. HC and FTE estimates should be identical to those in Appendix A – Table 1. Indicate the program costs for the first and the fifth years of implementation as shown in the appropriate columns in Appendix A – Table 3A or 3B. Calculate an Educational and General (E&G) cost per FTE for Years 1 and 5 by dividing total E&G by FTE.

Implementation Timeframe	нс	FTE	E&G Cost per FTE	E&G Funds	Contract & Grants Funds	Auxiliary/ Philanthropy Funds	Total Cost
Year 1	20	14	\$9,783	\$136,964	0	0	\$136,964
Year 2	40	28					
Year 3	60	42					
Year 4	80	56					
Year 5	80	56	\$7,340	\$411,039	0	0	\$411,039

Additional Required Signatures

I confirm that I have reviewed and approved Need and Demand Section III.F. of this proposal.

nelissak urry

Signature of Equal Opportunity Officer

10/10/2022

Date

I confirm that I have reviewed and approved Non-Faculty Resources Section VIII.A. and VIII.B. of this proposal.

6/28/2021

Date

Signature of Library Dean/Director

Introduction

I. Program Description and Relationship to System-Level Goals

- A. Describe within a few paragraphs the proposed program under consideration, and its overall purpose, including:
 - degree level(s)
 - majors, concentrations, tracks, specializations, or areas of emphasis
 - total number of credit hours
 - possible career outcomes for each major (provide additional details on meeting workforce need in Section III)

The proposed program under consideration is a non-thesis Master of Science with a major in Artificial Intelligence Systems degree program.

The Master of Science with a major in Artificial Intelligence Systems will consist of a set of 6 core courses (18 credit hours), one project course (3 credit hours), and 3 elective options selected from Table 1 (9 credit hours). The students will also have the option to have a committee chair/program faculty advisor reflected in UF GIMS.

The total number of credits for the degree will be 30.

This M.S. degree program is intended for students with strong analytical and computing backgrounds. For example, students with strong computing backgrounds and B.S. degrees in areas such as computer engineering or science, industrial and systems engineering, or physics would qualify to pursue this degree. Students working toward a Ph.D. in other engineering fields, such as agricultural and biological, biomedical, civil and coastal, chemical, electrical, environmental, mechanical, and aerospace and materials science engineering, may also be interested in and qualified to pursue this degree. Engineers are driving AI into a wide range of systems, including autonomous vehicles, aircraft engines, industrial plants, and wind turbines. These are complex, multidomain systems where behavior of the AI model has a substantial impact on the overall system performance. In this world, developing an AI model is not the finish line. It is merely a step along the way. [1]

Domains that are searching for AI engineers include conservation, education, industry, information management, marketing, medicine, military activities, robotics, and space travel.

Reference:

[1] 2020: Five Artificial Intelligence Trends For Engineers And Scientists (analyticsindiamag.com)

If the proposed program qualifies as a Program of Strategic Emphasis, as described in the Florida Board of Governors 2025 System Strategic Plan, please indicate the category.

- Critical Workforce
 - □ Education
 - □ Health
 - □ Gap Analysis
- Economic Development
 - ☑ Global Competitiveness
 - Science, Technology, Engineering, and Math (STEM)

□ Does not qualify as a Program of Strategic Emphasis.

II. Strategic Plan Alignment, Projected Benefits, and Institutional Mission and Strength

- A. Describe how the proposed program directly or indirectly supports the following:
 - System strategic planning goals (see link to the 2025 System Strategic Plan on the <u>New Program Proposals & Resources</u> webpage)
 - the institution's mission
 - the institution's strategic plan

By preparing engineering students to work in industry, pursue advanced studies in related AI areas, and reskilling and upskilling the engineering workforce in the State of Florida, the proposed Master of Science with a major in Artificial Intelligence Systems aligns with the State University System of Florida institutional mission statement to provide undergraduate, graduate and professional education, research, and public service of the highest quality through a coordinated system of institutions of higher learning, each with its own mission and collectively dedicated to serving the needs of a diverse state and global society. It also aligns with Goal 2 of the University of Florida Strategic Plan to provide an outstanding and accessible education that prepares students for work, citizenship, and life. The program also aligns well with UF Strategic Goal 3 (faculty recognized as preeminent by their students and peers) by utilizing new talent from the UF 500 and AI 100 hiring programs (ongoing), including preeminence hiring, increasing the institutional visibility and, in turn, helping attract new talent.

As AI is a technology and innovations driver in the multitude of industries in Florida's economy, the knowledge and skills acquired in this degree program will be instrumental to student's professional success, particularly as they contribute their expertise to addressing the systemic challenges facing the society and economy in Florida and beyond. By increasing student interest in and strengthening of the STEM core, the program will contribute to the BOG mission of achieving excellence in the tripartite mission of its state universities - teaching, research, and public service - for the benefit of Florida's citizens, their communities, and the state economy, by helping transform it to a knowledge economy. Specifically to UF, the program will help leverage AI technology to develop cutting-edge knowledge in agricultural, human, and natural resources and to make that knowledge accessible to sustain and enhance the quality of human life in Florida and beyond through training of the new generation of the tech workforce.

- B. Describe how the proposed program specifically relates to existing institutional strengths. This can include:
 - existing related academic programs
 - existing programs of strategic emphasis
 - institutes and centers
 - other strengths of the institution

The proposed Master of Science with a major in Artificial Intelligence Systems leverages existing institutional strengths in the Herbert Wertheim College of Engineering and the University of Florida, including the new Data Science and Information Technology (DSIT) Building. Data science and analytics are boosted by the Al initiative, which includes the Al-centric data center at the University of Florida that houses the world's fastest Al supercomputer in higher education.

c. Provide the date the pre-proposal was presented to the Council of Academic Vice Presidents Academic Program Coordination (CAVP ACG). Specify whether any concerns were raised and if so, provide a narrative explaining how each concern has been or will be addressed.

The CAVP Academic Coordinating review group approved the pre-proposal for the Master of Science with a major in Artificial Intelligence Systems on November 9, 2021.

- D. In the table below, provide a detailed overview and narrative of the institutional planning and approval process leading up to the submission of this proposal to the Board office. Include a chronology of all activities, providing the names and positions of both university personnel and external individuals who participated in these activities.
 - If the proposed program is a bachelor's level, provide the date the program was entered into the APPRiSe system, and, if applicable, provide narrative responding to any comments received from APPRiSe.
 - If the proposed program is a doctoral-level program, provide the date(s) of the external consultant's review in the planning table. Include the external consultant's report and the institution's responses to the report as Appendix B.

Date	Participants	Planning Activity
09/24/2019	CAVP Academic Coordinating Group	Approval of the pre-proposal for the MS in Artificial Intelligence Systems.
09/09/2020	Paul Gader, chair (CISE, ESSIE), Alina Zare (ECE), David Hibbitts (CHE), Hongcheng Liu (ISE), Michael Tonks (MSE), Nikolay Bliznyuk, co-Chair (ABE), Parisa Rashidi (BME), Ricardo Bevilacqua (MAE), Xilei Zhao (CCE), and Brenda Krames (Admin)	Committee purpose stated Introduction of members, all members are given access to Microsoft TEAM files, Nikolay Bliznyuk volunteers to Co-chair, Committee members are to suggest core and elective courses for the next meeting.

Planning Process

09/15/2020	Gader, Bevilacqua, Bliznyuk, Hibbits, Hongcheng, Tonks, Zhao, and Krames	General core with flexible paths of study with related electives, reviewed and discussed core and elective courses suggested by members, need more core suggestions.
9/21/2020	Bliznyuk, Hibbits, Hongcheng, Tonks, Zare, Zhao, and Krames	Core courses to consider, Parisa Rashidi created a new template for courses to discuss, suggested tables organize courses that can be mixed and matched as desired, next meeting's goal is to finalize core.
10/05/2020	Gader, Bliznyuk, Hibbits, Hongcheng, Tonks, Zare, Zhao, and Krames	Review of Core Courses: Ethics, Foundations of ML, ML, Advanced ML, Statistical ML offered as choices for ML core requirement, Al Systems – Rashidi will define the syllabus and bring a motion during the next meeting for core courses.
10/13/2020	Bevilaqua, Bliznyuk, Gader, Tonks, and Krames	Meeting was cut short, a brief description of ML syllabi and electives, committee member Hongcheng Liu will be replaced by Alexander Semenov.
10/19/2020	Bevilaqua, Bliznyuk, Gader, Hibbits, Rashidi, Semenov (ISE), Tonks, Zare, and Krames	Ai Systems syllabus presented and edited, voted unanimously as a core course, ML course options passed unanimously as a core path of 3 options, Ethics voted unanimously as core option, more discussion about Deep Learning at next meeting.
10/26/2020	Gader, Rashidi, Reisi (ISE), Tonks, Zare, and Krames	Alexander Semenov is replaced by Mostafa Reisi, considering refreshing CAP 6615 for Deep Learning, Paul Gader will contact CISE about cross-listing, discussed topics of DL: transformers & muppets, vote delayed for syllabus development.
11/02/2020	Bevilaqua, Bliznyuk, Gader, Hibbits, Rashidi, Reisi, Tonks, Zare, and Krames	Applied Deep Learning syllabus discussed and edited, approved by unanimous vote as a core course, bringing the total to 4 core courses, discussion of elective concentrations or general requirements: grade, admission and graduation requirements will be discussed next meeting.
11/10/2020	Bevilaqua, Bliznyuk, Gader, Hibbits, Rashidi, Reisi, Tonks, Zare, and Krames	Weekly meeting was cancelled, but committee members suggested elective courses by email to discuss at the next meeting.
11/16/2020	Bliznyuk, Rashidi, Reisi, Tonks, Zare, Zhao, and Krames	Electives were narrowed into 2 tables; a few courses will be evaluated for overlap with the core courses.
11/23/2020	Bliznyuk, Gader, Hibbits, Rashidi, Reisi, Tonks, Zare, Zhao, and Krames	The following tasks were divided up among committee members to complete for the next meeting: electives language, project course options/syllabus, contacting CISE, Deep Learning Course (core), admission requirements, and graduation requirements.
11/30/2020	Bevilaqua, Bliznyuk, Gader, Hibbits, Rashidi, Reisi, Tonks, Zare, and Krames	Consensus on electives language, consensus on requiring Ethics course prior to the project, project syllabus proposed, tables 1 and 2 were checked for overlap. Courses will be checked for teaching status, project syllabus will be finalized, and CISE will be contacted about cross-coverage.
12/7/2020	Bevilaqua, Bliznyuk, Gader, Hibbits, Rashidi, Reisi, Tonks, Zare, and Krames	Consensus on graduation requirements for core and elective courses: 3.0 GPA, consensus that the transfer of credits only be allowed as a rare exception. Agreed to add optimization courses to Table 1 of electives before the next meeting.
12/14/2020	Bliznyuk, Rashidi, Reisi, Tonks, Zare, and Krames	Consensus on credit transfers, consensus on courses offered in Table 1 of electives, final meeting of committee members.
1/21/2021	Paul Gader zoomed with Dean Abernathy	Reviewed proposed curriculum. Dean suggested edits to the core courses. Another committee meeting will need to be planned to discuss and make changes to the required courses.

2/3/2021	Bliznyuk, Gader, Hibbits, Rashidi, Reisi, Tonks, Zare, and Krames	Committee met to discuss broadening the core. Consensus was reached on developing 4 buckets/blocks of electives. Nikolay Bliznyuk will create a spreadsheet for committee members to sort electives.
2/19/2021	Gader, Dean Abernathy	Reviewed curriculum core and elective courses. Consensus: Computer Vision needs to be in the core. Edits will be presented to the committee.
3/9/2021	Bliznyuk, Gader, Rashidi, Zare, Zhao, and Krames	Dean Abernathy's revision requests were updated in the curriculum and discussed by the committee. Dr. Zhao will check on the status of a new autonomous vehicle course and offer to upload it with the new courses. Committee members will submit revisions to Table 2 to be discussed and voted upon. Members agreed to meet next week.
3/16/2021	Bliznyuk, Gader, Rashidi, Zare, Zhao, and Krames	Committee approved Dr. Rashidi's Table 2 concept., adjusted Table 1's suggested course.
3/23/2021	Gader, Dean Abernathy	Curriculum edits.
3/31/2021	Gader, Dean Abernathy	Curriculum edits.
4/9/2021	Gader, Dean Abernathy	Curriculum edits.

E. Provide a timetable of key events necessary for the implementation of the proposed program following approval of the program by the Board office or the Board of Governors, as appropriate, and the program has been added to the State University System Academic Degree Program Inventory.

Events Leading to Implementation

Please see page 10.

Date	Implementation Activity
4/19/2021	Curriculum and Artificial Intelligence Systems were uploaded into the Academic Approval System.
4/30/21	Curriculum Committee approves moving forward with Conditions of defining the Project Course and obtaining a favorable consult with CISE.
5/4/2021	Project in Artificial Intelligence Systems syllabus was uploaded into the Academic Approval System.
5/7/2021	Dr. Nishida, Dr. Gader and Brenda meet to debrief and formulate a plan for moving forward towards the Fall 2021 Curriculum Committee.
5/20/2021	Dr. Nishida, Dr. Gader and Brenda meet to review changes made to the proposal. Dr. Gader will reach out to Christina Gardner-McCune with CISE for a consult. Brenda will contact Kim Jaocbs requesting permission to incorporate her study on data demand for artificial intelligence as part of Section II: Need and Demand. Weekly meetings are set up to maintain momentum.
6/29/2021	Library Resource Evaluation received, with signature of Library Director
9/14/2021	Syllabi for Applied Deep Learning and Project in Artificial Intelligence Systems were sent to Serdar Kirli and Hans van Oostrom for review.
9/30/2014	As advised, revisions were made to syllabi for Applied Deep Learning and Project in Artificial Intelligence Systems by Dr. Rashidi.
10/1/2021	Revised syllabi for Applied Deep Learning and Project in Artificial Intelligence Systems were uploaded to the Academic Approval site.
10/06/2021	Favorable consult received from Arunava Banjerjee in CISE for Artificial Intelligence Systems. Projects in AI Systems and Applied Deep Learning new course proposals were tabled. Formal request for a consult from ECE about Projects in AI Systems and Applied Deep Learning was requested by Curriculum Committee.
11/23/2021	Committee members meet to discuss changes. Dr. Rashidi is assigned as Chair, relieving Dr. Gader due to family bereavement. New course, Machine Learning for AI Systems, was uploaded into the approval system.
12/06/2021	Favorable ECE Consult for Machine Learning for AI Systems.
12/08/2021	New course description provided by Dr. Silva for EGN 5XXX Machine Learning for AI Systems was uploaded into the approval system.
12/15/2021	Favorable CISE Consult for Machine Learning for AI Systems.
12/20/2021	ECE Consult for Applied Deep Learning uploaded to approval system with suggested edits to Applied-Deep-Learning.
12/20/2021	Applied-Deep-Learning's requested revisions uploaded.
1/7/2022	Machine Learning for AI Systems approved by College of Engineering
1/10/2022	Artificial Intelligence Systems was recycled for Dept-level Re-review Project in Artificial Intelligence Systems was recycled for Dept-level Re-review Master of Science with a degree in Artificial Intelligence Systems was recycled for Dept-level Re-review
1/18/2022	Machine Learning for AI Systems approved by HWCOE Curriculum Committee and Faculty Council
1/21/2022	Artificial Intelligence Systems - Approved by EED Project in Artificial Intelligence Systems - Approved by EED Applied Deep Learning - Approved by EED Master of Science with a degree in Artificial Intelligence Systems conditionally Approved, needs one slight modification in the representations of the degree program paths at end of document to make sure those choosing the ABE course have a path to completion.
2/21/2022	Curriculum Committee requested clarification on suggested course sequences about a realistic number of prerequisites.
3/7/2022	Curriculum-3-7-2022 uploaded to approval system with clarification on prerequisites.
3/10/2022	Overall Review with the Engineering Faculty Council (EFC)
4/6/2022	Master of Science with a major in Artificial Intelligence Systems is approved by College Curriculum Committee and at College Spring Faculty Meeting

Master of Science with a major in Artificial Intelligence Systems

5/2/2022	Graduate Curriculum Committee recommends updates to new course proposals 16463, 16106, & 16182
8/12/2022	EGN 5216 Machine Learning for Artificial Intelligence Systems was approved.
9/6/2022	Dr. NIshida met with Ginger to help populate Appendix A.
9/9/2023	Graduate Curriculum Committee approves updates to new course proposals 16463 & 16182 and these courses move forward.

Institutional and State Level Accountability

III. Need and Demand

- A. Describe the workforce need for the proposed program. The response should, at a minimum, include the following:
 - current state workforce data as provided by Florida's Department of Economic Opportunity
 - current national workforce data as provided by the U.S. Department of Labor's Bureau of Labor Statistics
 - requests for the proposed program from agencies or industries in your service area
 - any specific needs for research and service that the program would fulfill

An occupational data search on the Florida Department of Economic Opportunity (DEO) website projects a growth rate of 20.6% for Computer and Information Systems managers, including artificial intelligence. At the time of the search (6/11/2022), there were 17,028 openings with a median income of \$65.61/hour. <u>https://floridajobs.org/economic-data/employment-projections/occupational-data-search</u>

The U.S. Department of Labor and Statistics Occupational Outlook Handbook found at <u>https://www.bls.gov/ooh/</u> projects that employment in computer and information (artificial intelligence) technology occupations will grow 13 percent from 2020 to 2030, with about 667,600 new jobs. This is faster than the average for all occupations.

B. Provide and describe data that support student demand for the proposed program. Include questions asked, results, and other communications with prospective students.

A recent survey compiled based on responses from eight different industry sectors found 68% anticipate that AI skills will be a factor in hiring decisions within the next 2-5 years. Several computing skills were considered as moderately to extremely important among the workforce, including familiarity with data privacy principles (90.7%), cybersecurity principles (90.9%), IoT (75%), and computer networks (80%). When asked to indicate the degree to which their AI-enabled workforce needs to be knowledgeable, the following were cited as moderately to extremely important: the ability to critically analyze data (93.9%), integration with cloud systems (81%), and data storage, integrity, validation (78.4%).

Demand for artificial intelligence-related graduate courses is very high. Enrollment in the introductory artificial intelligence-related graduate courses at the University of Florida in Computer & Information Science & Engineering (CISE) and Electrical and Computer Engineering (ECE) has been as high as 120 and 160 students per class. Many of these students are from engineering departments other than CISE Master of Science with a major in Artificial Intelligence Systems

and ECE. The CISE and ECE students are interested in the underlying theory and computational methods, whereas other engineering students are interested in best practices in artificial intelligence using software and analyzing the products produced by the software. Therefore, other engineering students would be much more likely to take application-oriented courses, including working professional engineers, in fields such as agricultural and biological engineering, biomedical engineering, civil engineering, environmental engineering, and transportation engineering.

- C. Complete Appendix A Table 1 (1-A for undergraduate and 1-B for graduate) with projected student headcount (HC) and full-time equivalents (FTE).
 - Undergraduate FTE must be calculated based on 30 credit hours per year
 - Graduate FTE must be calculated based on 24 credit hours per year

In the space below, provide an explanation for the enrollment projections. If students within the institution are expected to change academic programs to enroll in the proposed program, describe the anticipated enrollment shifts and impact on enrollment in other programs.

The annual headcount/FTE projections are 20/14, 40/28, 60/42, 80/56, and 80/56 for the next 5 years. As stated in Section B, the demand for artificial intelligence-related graduate courses is extremely high. Enrollment in the introductory machine learning-related graduate courses at the University of Florida in Computer & Information Science & Engineering (CISE) and Electrical and Computer Engineering (ECE) has been as high as 120 and 160 students per class.

Since this M.S. is an interdisciplinary program, it will not cause a reduction in the enrollment rate in the home departments. The new degree program will lead to increased enrollments for new Master of Science engineering graduate students in the home departments who seek a working knowledge of artificial intelligence techniques/software and discipline-specific applications of artificial intelligence for building AI systems in industry-relevant engineering applications. These new graduate students include individuals with strong computing backgrounds who have recently graduated from preceding degree programs at UF and from preceding degree programs at other Florida public universities and professional engineers from agencies/industries in the service area seeking to up-skill/reskill.

See page 34 for Appendix A.

D. Describe the anticipated benefit of the proposed program to the university, local community, and the state. Benefits of the program should be described both quantitatively and qualitatively.

There is a growing demand for artificial intelligence systems in engineering fields, with at least 180,000 new jobs projected to be created by 2028 (section I.A). Data science, machine learning, and artificial intelligence fields together are expected to add an annual average contribution to global productivity growth of about 1.2 percent, according to the report by the McKinsey Global Institute [5]. Thus, students graduating with a M.S. degree with a major in Artificial Intelligence Systems are expected to be successfully employed in related positions in industry. This will include companies in different sectors such as tech, consumer products, aerospace, defense, pharmaceutical, and manufacturing, including Google, Amazon, IBM, Procter & Gamble, General Electric (GE), Lockheed Martin, among others. Within the state of Florida, there are jobs available at companies such as L3Harris Technologies (Melbourne, FL), CAE USA OPIE Software (Gainesville, FL), as well as local and regional startup companies. Beyond the economic benefits, program graduates in specialization

areas such as environmental engineering or agricultural and biological engineering can impact the state and local community by utilizing data science in sustainability and conservation projects such as coastal aquatic resource management, which is vital to the Florida economy and environment. Reference:

[5] Bughin, Jacques, Jeongmin Seong, James Manyika, Michael Chui, and Raoul Joshi. "Notes from the AI frontier: Modeling the impact of AI on the world economy." McKinsey Global Institute (2018).

E. If other public or private institutions in Florida have similar programs that exist at the four- or six-digit CIP Code or in other CIP Codes where 60 percent of the coursework is comparable, identify the institution(s) and geographic location(s). Summarize the outcome(s) of communication with appropriate personnel (e.g., department chairs, program coordinators, deans) at those institutions regarding the potential impact on their enrollment and opportunities for possible collaboration in the areas of instruction and research.

At the CIP code 11.102 artificial intelligence, there are two approved M.S. degrees in the Currently Approved Program Inventory of the State University System by FAU (Artificial Intelligence, MS) and UCF (Computer Vision, MS). The MS program at UCF is solely focused on Computer Vision and thus is not providing an encompassing training in AI systems. The MS program at FAU is focused on foundation of AI for computer science students and is not directed at building encompassing and full-stack AI systems. It is noted that FAU also has a Master of Science in "Data Science and Analytics" (CIP 30.0601), jointly administered between Charles E. Schmidt College of Science, the College of Engineering & Computer Science, the College of Business, and the Dorothy F. Schmidt College of Arts & Letters. It includes a specialization in Data Science and Engineering. However, the courses in the Data Science and Engineering specialization are not associated with applications to non-computing engineering fields, e.g., agricultural and biological engineering, biomedical engineering, civil engineering, environmental engineering, and transportation engineering. Similarly, existing M.S. degrees in Data Science have specializations in predominantly CS areas, with some also including business or biostatistics. The proposed M.S. with a major in Artificial Intelligence Systems is unique in its sole focus on building encompassing and full-stack AI systems for engineering applications.

F. Describe the process for the recruitment and retention of a diverse student body in the proposed program. If the proposed program substantially duplicates a program at FAMU or FIU, provide a letter of support from the impacted institution(s) addressing how the program will impact the institution's ability to attract students of races different from that which is predominant on the FAMU or FIU campus. The institution's Equal Opportunity Officer shall review this Section of the proposal, sign, and date the additional signatures page to indicate that all requirements of this section have been completed.

The applicant pool for the Master of Science with a major in Artificial Intelligence Systems will consist of students with strong computing backgrounds and B.S. degrees in areas such as computer engineering or science, industrial and systems engineering, or physics.

Students working toward a Ph.D. in other engineering fields, such as agricultural and

biological, biomedical, civil, and coastal, chemical, electrical, environmental, mechanical, and aerospace, and materials science engineering may also be interested in and qualified to pursue this degree.

Diverse students will be recruited through the Engineering National Graduate Institutional Name Exchange (ENGINE), the national McNair Scholars list, GEM Consortium Membership, engineering student societies (i.e., American Indian Science and Engineering Society (AISES), National Society of Black Engineers (NSBE), Out in Science, Technology, Engineering, and Mathematics (oSTEM), Society of Hispanic Professional Engineers (SHPE), Society of Women Engineers (SWE), etc.), GRE Search Service, National Name Exchange, and State of Florida Public University student access.

The diversity of students in non-computing engineering fields is greater than in computing engineering fields which will help to increase the diversity of students trained in artificial intelligence. This program is not a duplication of a program at FAU or UCF, and, therefore, the program will not compete with FAU or UCF, but instead, it will work directly with these institutions to grow underrepresented students' participation in artificial intelligence in the SUS.

IV. Curriculum

A. Describe all admission standards and all graduation requirements for the program. Hyperlinks to institutional websites may be used to supplement the information provided in this subsection; however, these links may not serve as a standalone response. For graduation requirements, please describe any additional requirements that do not appear in the program of study (e.g., milestones, academic engagement, publication requirements).

To be admitted into the M.S. program, students must have a B.S. in Engineering from an ABETaccredited program (or equivalent technical background such as physics, math, or statistics), a strong computing background with proficiency in one or more modern programming languages such as Python, and meet these general graduate school requirements: GPA: Minimum of 3.0 for all upper-level courses GRE: Waived

International applicants are exempt from the English proficiency requirement after completing one academic year at a recognized, regionally accredited university or college in a country where English is the official language. Students will have to meet all requirements of the University of Florida Graduate School Admissions and the following requirements: TOEFL: 550 on paper-based; (213 on computer-based; 80 on Internet-based) TOEFL may be substituted with IELTS: 6 or MELAB: 77

Transfer of credits from another institution or program to count towards the M.S. degree is only accepted "under extraordinary circumstances" through a formal petition process. It will be subject to the limits and conditions set forth by the UF Graduate School and Herbert Wertheim College of Engineering. Petitions for transfer of credit should be made during the student's first term of enrollment in the M.S. program. No more than nine credits (earned with a grade of A, A-, B+, or B) may be transferred from institutions approved for this purpose. Only graduate-level (5000-

7999) work is eligible for transfer of credit. Acceptance of credit transfer requires the approval of the M.S. committee and the Dean of the Graduate School.

The appropriate grade point requirements for graduation are:

1. A minimum grade of 3.00 (B or higher) in each core course (in the absence of the qualifying exam)

2. An overall GPA of 3.00 (truncated) or higher across all eligible courses applied to the M.S. degree

- 3. A major GPA of 3.00 (truncated) or higher
- 4. A minor GPA of 3.00 (truncated) or higher, if appropriate.
- B. Describe the specific expected student learning outcomes associated with the proposed program. If the proposed program is a baccalaureate degree, include a hyperlink to the published Academic Learning Compact and the document itself as Appendix C.

Student Learning Outcomes (SLOs) for the Master of Science with a major in Artificial Intelligence Systems Program. For the program to meet the outcome, it is expected that >70% of students score 80% or higher.

Learning Outcomes	Assessment Method/Measure
SLO 1: To analyze, design, implement, and evaluate an AI systems solution to meet a given set of system requirements.	Successful completion of the final assignment in the "Artificial Intelligence Systems" course.
SLO 2: 3. To recognize professional responsibilities and make informed decisions when developing AI systems based on legal, ethical, and policy principles.	Successful completion of the final assignment in "AI, Machine Learning and Ethics in Law and Regulation"
SLO 3: 3. To function effectively as a member of a team engaged to develop an AI systems solution.	Successful presentation of the final project in the "Project in Artificial intelligence Systems" course.

The Master of Science with a major in Artificial Intelligence Systems degree will provide students with a working knowledge of techniques and software commonly used in Artificial Intelligence Systems. The degree is designed for students with strong analytical and computing backgrounds. For example, students with strong computing backgrounds and B.S. degrees in areas such as computer engineering or science, industrial and systems engineering, or physics would qualify to pursue this degree. Students working toward a Ph.D. in other engineering fields, such as agricultural and biological, biomedical, civil and coastal, chemical, electrical, environmental, mechanical, and aerospace and materials science engineering, may also be interested in and qualified to pursue this degree.

- C. If the proposed program is an AS-to-BS capstone, provide evidence that it adheres to the guidelines approved by the Articulation Coordinating Committee for such programs, as outlined in <u>State Board of Education Rule 6A-10.024</u>. Additionally, please list the prerequisites, if any, and identify the specific AS degrees that may transfer into the proposed program.
 - ⊠ Not applicable to this program because it is not an AS-to-BS Capstone.

- D. Describe the curricular framework for the proposed program, including the following information where applicable:
 - total number of semester credit hours for the degree
 - number of credit hours for each course
 - required courses, restricted electives, and unrestricted electives
 - a sequenced course of study for all majors, concentrations, tracks, or areas of emphasis

The proposed Master of Science with a major in Artificial Intelligence Systems is a 30- credit hour, non-thesis degree that consists of a set of 6 core courses (18 credit hours), one project course (3 credit hours), and 3 electives options selected from Table 1 (9 credit hours). The students will also have the option to have a committee chair/program faculty advisor reflected in UF GIMS.

The 6 core courses are in the following areas:

- AI Systems course number pending at the Office of the Registrar
- Deep Learning e.g., EGN 6217 , EEE 5502
- Ethics LAW 6930
- Fundamental Machine Learning e.g., EGN 5216, EEE 5776, EEE 677
- Security e.g., CIS 6930 , EEL 5739 , EEE 6561, EEE 6512
- Sensing and Analysis e.g., EEL 5406, EEE 6512

The selection of 3 elective options must include at least 1 course from one of the following areas:

- Advanced Machine Learning and Data Driven Modeling e.g., BME 6938, CAP 6617, EEL 5840, EEL 6814, EEL 6825, EEE 6504, ESI 6355, ESI 6492, STA 6703
- Autonomy, Robotics, and Human-Centered Computing e.g., ABE 6005, CAP 5108, CEN 5726, EML 6351

Three Suggested Course Sequences:

- Table A.1 Autonomy, Robotics, and Human-Centered Computing, p. 17
- Table A.2 Computer Vision and Deep Learning, p. 18
- Table A.3 Machine Learning and Data Analytics, p. 18

Some of the suggested elective courses might require additional prerequisites; students are advised to consult with academic advisors before taking such courses.

Table A.1: A Suggested Sequence for M.S. Core and Elective Courses that focuses on Autonomy, Robotics, and Human-Centered Computing

This sample sequence is fulfilled without the need to take additional electives EEE 5502 and EML 6350.

	Term 1	Term 2
	Core: Machine Learning EGN 5216 Machine Learning for Artificial Intelligence Systems	Core: Sensing and Analysis EEL 5406 Computational Photography
Year 1	Core: Security EEL 5739 IoT Security and Privacy	Core: Deep Learning: EGN 6217 Applied Deep Learning
		Core: LAW 6930 AI, Machine Learning and Ethics in Law and Regulation
	Elective: (AR-HCC) CAP 5108 Research Methods for Human Centered Computing	Project: Project in Artificial Intelligence Systems*
Year 2	Elective: (AML-DDM) STA 6703 Statistical Machine Learning <i>or</i> EEL 5840 Foundations of Machine Learning	Elective: (AR-HCC) CEN 5726 Natural User Interaction: or Elective: (AR-HCC) ABE 6005 Applied Control for Automation and Robotics
	Core: Artificial Intelligence Systems*	

*Indicates new course currently pending in the UF Academic Approval process.

Table A.2: A Suggested Sequence for M.S. Core and Elective Courses that focuses on Computer Vision and Deep Learning.

	Term 1	Term 2
Year 1	Core: Deep Learning EGN 6217 Applied Deep Learning EEE 5502 Digital Signal Processing Core: Machine Learning EGN 5216 Machine Learning for Artificial Intelligence Systems	Core: LAW 6930 AI, Machine Learning and Ethics in Law and Regulation Core: Sensing and Analysis EEE 6512 Image Processing and Computer Vision Core:
	Elective: Sensing and Analysis EEL 5406 Computational Photography	Artificial Intelligence Systems*
Year 2	Core: Security EEE 6561 Fundamentals of Biometric Identification	Project: Project in Artificial Intelligence Systems*
	Elective: (AML-DDM) EEL 6814 Deep Learning	Elective: (AR-HCC) CEN 5726 Natural User Interaction or ABE 6005 Applied Control for Automation and Robotics

*Indicates new course currently pending in the UF Academic Approval process.

Table A.3: A Suggested Sequence for M.S. Core and Elective Courses that focuses onMachine Learning and Data Analytics.

	Term 1	Term 2
Year 1	Core: Security	Core:
	CIS 6930 Trustworthy Machine Learning	LAW 6930 AI, Machine Learning and Ethics
		in Law and Regulation
	Core: Machine Learning EGN	Elective: (AML-DDM)
	5216 Machine Learning for Artificial	STA 6703 Statistical Machine Learnin <u>g or</u>
	Intelligence Systems	EEL 5840 Foundations of Machine Learning
	Elective: (AML-DDM)	Core: Deep Learning
	EEL 6825 Pattern Recognition and Intelligent	EGN 6217 Applied Deep Learning
	Systems	
Year 2	Elective: (AML-DDM)	Project:
	BME 6938 Biomedical Data Science	Project in Artificial Intelligence Systems*
	Elective: (AR-HCC)	Core:
	CAP 5108 Research Methods for Human Centered	Artificial Intelligence Systems*
	Computing	New Course currently in Academic Approval System

*Indicates new course currently pending in the UF Academic Approval process.

E. Provide a brief description for each course in the proposed curriculum.

Core Course Descriptions:

Ethics:

• LAW 6930 AI, Machine Learning and Ethics in Law and Regulation: (3 credit hours)

Prerequisite: None

Description: Introduces students to the legal, policy, and ethical dimensions of AI, big data, predictive analytics, and related techniques.

Fundamental Machine Learning:

• <u>EGN 5216 Machine Learning for Artificial Intelligence Systems</u>: (3 credit hours) Prerequisites: General knowledge of calculus, probability and statistics, linear algebra, and familiarity with at least one programming language.

Description: This course aims to provide a framework to develop real-world machine learning systems that are deployed, reliable, and scalable. The focus of this course is to introduce basic modules of machine learning systems, namely, data management, data engineering, approaches to model selection, training, scaling, monitoring, and deploying to machine learning systems.

Deep Learning: (Select 1 of these 2 options)

• CAP 6615 Neural Networks for Computing: (3 credit hours)

Prerequisite: CAP 5635, familiarity with basic concepts in calculus, linear algebra, and probability theory Description: Neural network models and algorithms. Adaptive behavior, associative learning, competitive dynamics, and biological mechanisms.

• EGN 6217 Applied Deep Learning: (3 credit hours)

Prerequisite: EGN 5216

Description: Covers the concepts, frameworks, and tools used for building deep learning models. It will also examine applications of deep learning systems in computer vision and natural language processing (NLP).

Artificial Intelligence Systems:

• Artificial Intelligence Systems*: (3 credit hours)

Prerequisite: EGN 5216

Description: Apply the concepts, frameworks, and tools used for building Artificial Intelligence (AI) systems in the real world. Examines the life cycle of AI systems and how such systems can be successfully deployed at scale and can be monitored in production.

*New course currently pending in UF's Academic Approval System process.

Sensing and Analysis: (Select 1 of these 3 options)

• CAP 5416 Computer Vision: (3 credit hours)

Prerequisites: MAC 2312 or Equivalent, COT 4501 or equivalent, and Proficiency in MATLAB or C++, or Java. Description: Introduction to image formation and analysis. Monocular imaging system projections, camera model calibration, and binocular imaging. Low-level vision techniques, segmentation and representation techniques, and high-level vision.

• EEE 6512 Image Processing and Computer Vision: (3 credit hours)

Prerequisites: EEE 5502

Description: Pictorial data representation; feature encoding; spatial filtering; image enhancement; image segmentation; cluster seeking; two-dimensional z-transforms; scene analysis; picture description language; object recognition; pictorial database; interactive graphics; picture understanding machine.

• EEL 5406 Computational Photography: (3 credit hours)

Prerequisite: EEL 3135 or equivalent

Description: Basics of computational photography, as it relates to applications in computer vision, graphics, and imaging. Teaches how models of light from radiometry and optics can be used to understand scene information from images, build novel sensors and create new photographs.

Security: (Select 1 of these 3 options):

• CIS 6930 Trustworthy Machine Learning: (3 credit hours)

Prerequisite: EGN 5216

Description: Introduces foundational concepts and recent developments at the intersection of machine learning with security and privacy.

• EEE 6561 Fundamentals of Biometric Identification: (3 credit hours)

Prerequisite: EEE 6512, Image Processing and Computer Vision.

Description: Methods and principles for the automatic identification/authentication of individuals. Technologies include fingerprint, face, and iris biometrics. Additional topics include biometric system design, performance evaluation, multi-modal biometric systems, and biometric system security.

• EEL 5739 IoT Security and Privacy: (3 credit hours)

Prerequisites: Programming experience and basic C programming Description: Introduces the advanced topics of IoT security and privacy challenges and will systematically analyze IoT security from hardware, communication, and system perspectives.

Project:

• Project in Artificial Intelligence Systems*: (3 credit hours)

Prerequisites: EGN 6615, LAW 6930, EGN 5216, and Artificial Intelligence Systems* Description: Students will learn to work as a team to identify problems that can be addressed using artificial intelligence (AI) systems, will design practical solutions to such problems, and will apply AI concepts, frameworks, and tools successfully to implement system solutions, while upholding ethical AI considerations.

*New course currently pending in UF's Academic Approval System process.

Electives:

Table 1: Elective Course Options

Select 3 courses; selections must include at least 1 course from Group 1 and 1 course from Group 2:

- <u>Group 1</u>: AML-DDM: Advanced Machine Learning and Data-Driven Modeling,
- Group 2: AR-HCC: Autonomy, Robotics, and Human-Centered Computing,

• <u>Group 3</u>: UT: unrestricted technical electives. This group allows the students to take a technical elective course for greater curriculum flexibility. For example, a student interested in computer vision or robotics may take EEE 5502 (Foundations of Digital Signal Processing) or EML 6350 (Nonlinear Control) to expand the available course options for core and elective

courses. The technical elective courses in this group must be chosen in coordination with the graduate advisor to ensure prerequisite fulfillment and to optimize for achieving student career goals (e.g., courses related to entrepreneurship).

This list is not an exhaustive list and may be subject to change. Some of the elective courses might require additional prerequisites; students are advised to consult with academic advisors before taking such courses.

Advanced Machine Learning and Data Driven Modeling (AML-DDM)	BME 6938 Biomedical Data Science					
	CAP 6617 Advanced Machine Learning					
	<u>EEL 5840</u> Elements of Machine Intelligence or <u>STA 6703</u> Statistical Machine Learning					
	EEL 6814 Deep Learning					
	EEL 6825 Pattern Recognition and Intelligent Systems					
	ESI 6492 Global Optimization					
	EEE 6504 Machine Learning for Time Series					
	ESI 6355 Decision Support Systems for Industrial & Systems Engineering					
Autonomy, Robotics, and Human-Centered Computing (AR-HCC)	ABE 6005 Applied Control for Automation and Robotics					
	CAP 5108 Research Methods for Human Centered Computing					
	CEN 5726 Natural User Interaction					
	EML 6351 Adaptive Control					

Brief Course Descriptions of Electives:

ABE 6005 Applied Control for Automation and Robotics: (3 credit hours)

Prerequisites: EML 5311, equivalent, or consent.

Description: Introduction to industrial controls, programmable logic controllers, and manipulator application programming in agricultural and biological engineering. Kinematics, dynamics, and control strategies for serial link manipulators in agricultural applications.

BME 6938 Biomedical Data Science: (3 credit hours)

Prerequisite: None

Description: Covers the fundamental frameworks and tools used for applying data science techniques to biomedical problems.

CAP 5108 Research Methods for Human-Centered Computing: (3 Credit hours)

Prerequisites: working knowledge of basic concepts in probability and statistics with applications in electrical, mechanical, and civil engineering; discrete structures applications; basic concepts in probability and statistics with engineering applications; and data structures and algorithms

Description: Introduces the fundamental methods and techniques to evaluate technologies and collect data from humans, including experimental design, types of variables, types of errors, hypothesis testing,

survey design, behavioral and psychophysical methods.

CAP 6617 Advanced Machine Learning: (3 credit hours)

Prerequisite: CAP 6610

Description: Advanced concepts in developing computer programs that learn and improve with experience. Emphasis on methods based on probability, statistics, and optimization.

CEN 5726 Natural User Interaction: (3 credit hours)

Prerequisite: working knowledge of data structures and algorithms

Description: Introducing design, development, and evaluation of Natural User Interaction technologies. Key concepts include hardware-to-software NUI pipeline and considerations in NUI software.

EEE 6504 Machine Learning for Time Series: (3 credit hours)

Prerequisites: EEL 5840 Description: Theory of adaptation with stationary signals; performance measures; LMS, RLS algorithms; Implementation issues and applications.

EEL 5840 Elements of Machine Intelligence: (3 credit hours)

Prerequisites: None Description: Engineering and hardware concepts pertaining to the design of intelligent computer systems.

EEL 6814 Deep Learning: (3 credit hours)

Prerequisite: EEL 5840

Description: Nonlinear modeling in neural networks and kernel spaces. Gradient descent learning in the additive neural model. Statistical Learning Concepts. Information theoretic cost functions. Convolution neural networks. Recurrent neural networks. Foundations of Deep Learning. Importance of Deep learning for representation. Current models for image and speech recognition. Challenges of Deep Learning.

EEL 6825 Pattern Recognition and Intelligent Systems: (3 credit hours)

Prerequisites: undergraduate-level signals and systems, undergraduate-level probability theory/stochastic processes, some exposure to MATLAB and C programming language, knowledge of basic matrix theory helpful, but not necessary

Description: Impart a working knowledge of several important and widely used pattern recognition topics to the students through a mixture of motivational applications and theory.

EML 6351 Adaptive Control: (3 credit hours)

Prerequisites: EML 6350

Description: Students will be introduced to topics including repetitive learning control, model reference adaptive control, Lyapunov-based adaptive control, Neural Network function approximation methods, composite and modular adaptive control, concurrent learning, and adaptive critic-based reinforcement learning control.

ESI 6355 Decision Support Systems for Industrial & Systems Engineering: (4 credit hours)

Prerequisite: Programming course in C++ or Java and operations research.

Description: Applications of decision support systems: developing and implementing systems arising in industrial and systems engineering using popular database management and spreadsheet software.

ESI 6492 Global Optimization: (3 credit hours)

Prerequisites: Linear and Nonlinear Programming or any equivalent

Description: Introduces the main concepts and techniques of global optimization. Topics to be covered include Properties of Nonconvex Functions, Convex Envelopes, Duality, Complexity, Applications and Software Issues, Algorithms for Quadratic Programming, Concave Minimization, D.C. Programming,

Lipschitz Optimization, Nonconvex Network Flow Problems and Decomposition Algorithms.

STA 6703 Statistical Machine Learning: (3 credit hours)

Prerequisites: Knowledge of linear algebra, multivariate calculus, calculus-based probability, and basic programming

Description: Methodology and application of tools of statistical ML, emphasizing statistical approaches to machine learning while prioritizing application and the intuition behind statistical methods rather than formal derivations and justification of the procedures.

For degree programs in medicine, nursing, and/or allied health sciences, please identify the courses that contain the competencies necessary to meet the requirements identified in <u>Section 1004.08</u>, Florida Statutes. For teacher preparation programs, identify the courses that contain the competencies necessary to meet the requirements outlined in <u>Section 1004.04</u>, Florida <u>Statutes</u>.

 \boxtimes Not applicable to this program because the program is not a medicine, nursing, allied health sciences, or teacher preparation program.

F. Describe any potential impact on related academic programs or departments, such as an increased need for general education or common prerequisite courses or increased need for required or elective courses outside of the proposed academic program. If the proposed program is a collaborative effort between multiple academic departments, colleges, or schools within the institution, provide letters of support or MOUs from each department, college, or school in Appendix D.

Since the proposed Master of Science with a major in Artificial Intelligence Systems is interdisciplinary within the Herbert Wertheim College of Engineering, the potential impacts of increased graduate student enrollment will be shared across its 11 departments.

G. Identify any established or planned educational sites where the program will be offered or administered. If the proposed program will only be offered or administered at a site(s) other than the main campus, provide a rationale.

Traditional delivery on campus.

H. Describe the anticipated mode of delivery for the proposed program (e.g., face-to-face, distance learning, hybrid). If the mode(s) of delivery will require specialized services or additional financial support, please describe the projected costs below and discuss how they are reflected in Appendix A – Table 3A or 3B.

Anticipated mode: Face-to-face

 Provide a narrative addressing the feasibility of delivering the proposed program through collaboration with other institutions, both public and private. Cite any specific queries made of other institutions with respect to shared courses, distance/distributed learning technologies, and joint-use facilities for research or internships.

This proposed degree program will be traditional delivery on campus. There will not be collaborations at this point with other institutions.

- J. Describe any currently available sites for internship and/or practicum experiences. Describe any plans to seek additional sites in Years 1 through 5.
 - □ Not applicable to this program because the program does not require internships or practicums.

Local internship opportunities may be found at these websites: **Gator CareerLink** – <u>Sign in (symplicity.com)</u> **Career Connections Center** – <u>Career Connection Center Main – career.ufl.edu</u> **Infotech** – <u>https://www.infotechinc.com/student-opportunities</u> **UF Innovate** – <u>https://innovate.research.ufl.edu/tech-licensing/fellows-program/</u> **UF Information Technology** (UFIT) <u>https://es.ufl.edu/internship-program/</u>

National/international internship opportunities include: **Amazon** – <u>Amazon.jobs</u> – Search Intern **Apple** – <u>https://www.apple.com/jobs/us/students.html</u> **Chegg** – <u>Traits AI, Inc. – Machine Learning Intern | Chegg Internships</u> **Facebook** – <u>The Artificial Intelligence (AI) Residency Program – Facebook AI</u> **Google** – <u>https://careers.google.com/students/engineering-and-technical-jobs/</u> **IBM** Intern – <u>IBM Careers U.S. – Internships & Co-Ops</u> **Intel** Internships – <u>https://jobs.intel.com/page/show/internships</u> **Microsoft** Internship Opportunities for Students: <u>https://careers.microsoft.com/students/us/en</u> **Oracle** Students and Grads – <u>https://www.oracle.com/corporate/careers/students-grads/college/</u> **Verizon** – <u>Full-Time Students – Internships & Co-Op Jobs | About Verizon</u> **Virtual Internships** Practicum Digital – <u>https://sites.google.com/view/practicum-digital/welcome</u>

V. Program Quality Indicators – Reviews and Accreditation

A. List all accreditation agencies and learned societies that would be concerned with the proposed program. If the institution intends to seek specialized accreditation for the proposed program, as described in <u>Board of Governors</u> <u>Regulation 3.006</u>, provide a timeline for seeking specialized accreditation. If specialized accreditation will not be sought, please provide an explanation.

Specialized accreditation is available from ABET, Inc. While ABET accreditation is crucial for undergraduate engineering programs, very few graduate engineering programs seek accreditation. None of UF's engineering graduate programs are accredited by ABET. There is no need for specialized accreditation for licensure or certification for professional practice. We do not plan to seek specialized accreditation for this program.

B. Identify all internal or external academic program reviews and/or accreditation visits for any degree programs related to the proposed program at the institution, including but not limited to programs within academic unit(s) associated with the proposed degree program. List all recommendations emanating from the reviews and summarize the institution's progress in implementing those recommendations.

The Electrical Engineering undergraduate program, which is a feeder for this M.S. program, was visited and reviewed in 2017 by ABET. No deficiencies, weaknesses, or concerns were found.

C. For all degree programs, discuss how employer-driven or industry-driven competencies were identified and incorporated into the curriculum. Additionally, indicate whether an industry or employer advisory council exists to provide input for curriculum development, student assessment, and academic-force alignment. If an advisory council is not already in place, describe any plans to develop one or other plans to ensure academic-workforce alignment.

The compiled information from EMSI, the Labor Market Analytics & Economic tool, was used to understand the educational needs of graduating students. EMSI data primarily focused on AI-related skills and understanding the job market needs. The committee also examined the 2020 HWCOE survey results of industry partners located in Florida and neighboring states to identify high demand AI skills by industry.

VI. Faculty Participation

- A. Use Appendix A Table 2 to identify existing and anticipated full-time faculty who will participate in the proposed program through Year 5, excluding visiting or adjunct faculty. Include the following information for each faculty member or position in Appendix A Table 2:
 - the faculty code associated with the source of funding for the position
 - faculty member's name
 - highest degree held
 - academic discipline or specialization
 - anticipated participation start date in the proposed program

- contract status (e.g., tenure, tenure-earning, or multi-year annual [MYA])
- contract length in months
- percent of annual effort that will support the proposed program (e.g., instruction, advising, supervising)

This information should be summarized below in narrative form. Additionally, please provide the curriculum vitae (CV) for each identified faculty member in Appendix E.

It is anticipated that the following tenured faculty members will participate in the proposed program: Parisa Rashidi (Chair, BME), Paul Gader (CISE, ESSIE), Nikolay Bliznyuk (ABE), Alina Zare (ECE), Michael Tonks (MSE), and David Hibbits (CHE). Tenure-Track faculty, including Mostafa Reisi (ISE) and Xilei Zhao (CCE, ESSIE), and Non-Tenure lecturer, Catia Silva (ECE), are also anticipated to participate through Year 5.

B. Provide specific evidence demonstrating that the academic unit(s) associated with the proposed program have been productive in teaching, research, and service. Such evidence may include trends over time for average course load, FTE productivity, student HC in major or service courses, degrees granted, external funding attracted, and other qualitative indicators of excellence (e.g., thesis, dissertation, or research supervision).

Collectively, the list of achievements and awards received by the associated faculty members includes the Google Faculty Research Award, the National Institute of Health Trailblazer Award, National Science Foundation Faculty Early Career Development Program Award, National Academy of Engineering Frontiers of Engineering Award, Mitchell Max Award Finalist, IEEE Fellow, and University of Florida Research Foundation Professor and over 16 Patents.

The combined funded research awards for the 2020-2021 academic year are approximately \$8.1 million by the following sponsors: National Science Foundation, UF Founders, US Department of Energy, PA State University, Cornell University, Argonne National Lab, UF Foundation, USC, National Institute of Health NIA, UF Division of Sponsored, US Army Research Office, Everglades National Park, Advanced Technology International, US Department of Agriculture National Institute of Food and Agriculture, Wilfred Laurier University, Woods Hole dba Woodwell Climate Research Center, Earth Science Information Partners, UF Division of Sponsored Research Strategic Initiative, and the UF Division of Sponsored Research Matching Funds.

The associated faculty members have served as M.S. and Ph.D. advisors. They collectively advised well over 50 Ph.D. students to graduation. The faculty have also taught major and service courses ranging from small class sizes (under 10) to classes of over 150 students in size.

VII. Budget

- A. Use Appendix A Table 3A or 3B to provide projected costs and associated funding sources for Year 1 and Year 5 of program operation. In narrative form, describe all projected costs and funding sources for the proposed program(s). Data for Year 1 and Year 5 should reflect snapshots in time rather than cumulative costs.
- B. Use Appendix A Table 4 to show how existing Education & General (E&G) funds will be reallocated to support the proposed program in Year 1. Describe each funding source identified in Appendix A Table 4, and provide a justification below for the reallocation of resources. Describe the impact the reallocation of financial resources will have on existing programs, including any possible financial impact of a shift in faculty effort, reallocation of instructional resources, greater use of adjunct faculty and teaching assistants, and explain what steps will be taken to mitigate such impacts.
- C. If the institution intends to operate the program through continuing education, seek approval for market tuition rate, or establish a differentiated graduate-level tuition, as described in <u>Board of Governors Regulation 8.002</u>, provide a rationale and a timeline for seeking Board of Governors' approval.

☑ Not applicable to this program because the program will not operate through continuing education, seek approval for market tuition rate, or establish a differentiated graduate-level tuition

- D. Provide the expected resident and non-resident tuition rate for the proposed program for both resident and non-resident students. The tuition rates should be reported on a per credit hour basis, unless the institution has received approval for a different tuition structure. If the proposed program will operate as a continuing education program per <u>Board of Governors Regulation 8.002</u>, please describe how the tuition amount was calculated and how it is reflected in Appendix A Table 3B.
- E. Describe external resources, both financial and in-kind support, that are available to support the proposed program, and explain how this amount is reflected in Appendix A Table 3A or 3B.

VIII. Non-Faculty Resources

- A. Describe library resources currently available to implement and/or sustain the proposed program through Year 5 below, including but not limited to the following:
 - the total number of volumes and serials available in the discipline and related disciplines

• all major journals that are available to the university's students The Library Director must sign the additional signatures page to indicate that they have review Sections VIII.A. and VIII.B.

The Libraries of the University of Florida form the largest information resource system in the state of Florida. The libraries hold over 6.7M print volumes, 1.5M e-books, and provide access to over 148K full-text print and electronic journals, as well as over 1992 electronic databases. The George

A. Smathers Libraries of the University of Florida, a system of six research libraries, includes libraries for sciences, humanities & social sciences, architecture & fine arts, education, and health sciences. Additional library resources are available in two specialized libraries, the UF Digital Collections and the Special & Area Studies Collection. Books and periodicals related to artificial intelligence and machine learning are primarily online resources. Any print resources are located primarily in the Marston Science Library.

Electronic books, journals, and many key databases, such as ACM Digital Library, IEEE Explore Digital Library, Web of Science, Proquest SciTech Collection, and others, are available via the internet to UF students, faculty, and staff. Many relevant databases are multidisciplinary and are funded centrally. The UF Libraries expend over \$12.2 million annually on electronic resources. Listed below is a selection of the important journals available through UF Libraries for use by students pursuing a master's in Artificial Intelligence Systems:

- Artificial intelligence
- Artificial Intelligence Review
- Big Data Research
- Foundations and Trends in Machine Learning
- International Journal of Data Science and Analytics
- Machine Learning
- SIGKDD Exploration
- ACM Transactions on Knowledge Discovery from Data
- IEEE Transactions on Fuzzy Systems
- IEEE Transactions on Neural Networks and Learning Systems
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- Information Visualization
- Intelligent Data Analysis

Master of Science with a major in Artificial Intelligence Systems

- Journal of Data Mining and Knowledge Discovery
- Journal of Data Science
- Journal of Intelligent Information Systems
- Journal of Machine Learning Research
- Nature Machine Intelligence
- Pattern Recognition
- KAIS: Knowledge and Information Systems: An International Journal

In addition, there are a small yet growing number of open-access journals in the field; the content of these journals is freely available to readers and discoverable through the UF libraries catalog and journal databases. Here are three open-access journals related to data science:

- Journal of Robotics, Networking and Artificial Life
- Journal of Big Data (Springer Open)
- Transactions on Machine Learning and Data Mining

The Libraries hold memberships in a number of consortia and in institutions such as the Center for Research Libraries, ensuring access to materials not held locally. "Uborrow" service allows UF patrons to easily borrow materials from any other Florida state university or college library. Materials not held in UF collections and unavailable via Uborrow are procured through Interlibrary Loan. Interlibrary Loan requests are fulfilled at no cost to the library patron; participation in this library collection exchange program is paid for by the UF Libraries. All students, faculty, and staff may use interlibrary loan services.

With monies allocated through the Provost and the UF budgeting process, the library materials budget is determined by the Dean of Libraries in consultation with the Senior Associate Dean for Scholarly Resources & Research Services and subject specialist librarians. Standing subscriptions to journal literature and databases make up the majority of purchasing. Online research guides for all UF disciplines and many specific topics are available from the library website <u>http://library.ufl.edu</u>. Many online tutorials for specific databases are also available. Additionally, the UF Libraries offer consultations, workshops, and events throughout the year.

B. Discuss any additional library resources that are needed to implement and/or sustain the program through Year 5. Describe how those costs are reflected in Appendix A – Table 3A or 3B.

□ Not applicable to this program because no additional library resources are needed to implement or sustain the proposed program.

A subscription to the O'Reilly Safari electronic platform is recommended, though not mandated. Safari provides a comprehensive collection of artificial intelligence and data science resources,

including content from other leading publishers in this field. The platform is also interactive, with hands-on learning experiences to support student acquisition of technical skills and knowledge. An annual subscription to Safari would be approximately \$71,000.

InCites Journal Citation Report curates a list of the highest-ranked 137 journals in the category of Computer Science and Artificial Intelligence. Although the library subscribes to most of the top journals on its list, we do not currently subscribe to the following:

- Foundations and Trends in Machine Learning (\$740 annually)
- Big Data (\$3,351 annually)
- International Journal of Business Intelligence and Data Mining (\$1,195 annually)

While our present journal subscriptions will support the proposed major as currently defined, adding these journals to our eJournal collection would be helpful long term.

C. Describe any specialized equipment and space currently available to implement and/or sustain the proposed program through Year 5.

The proposed Master of Science with a major in Artificial Intelligence Systems degree program will use the extensive Graphics Processing Unit (GPU) resources provided by the Research Computing center. Research Computing operates HiPerGator, UF's supercomputer, a cluster-based system with a combined capacity of about 46,000 cores in multi-core servers. The servers are part of an integrated InfiniBand fabric. The clusters share over 7 PetaBytes of distributed storage via the Lustre parallel file system. In addition, Research Computing houses about 2.8 PB of storage for the High Energy Physics collaboration of the Compact Muon Solenoid (CMS) experiment. The system includes 80 NVIDIA K80 GPUs for simulation, 560 NVIDIA GeForce RTX 2080ti, and 48 NVIDIA Quadro RTX 6000 GPUs for machine learning, deep learning, Artificial Intelligence, and simulation and modeling, available for exploratory and production research, as well as for training and teaching.

D. Describe any additional specialized equipment or space that will be needed to implement and/or sustain the proposed program through Year 5. Include any projected Instruction and Research (I&R) costs of additional space in Appendix A – Table 3A or 3B. Costs for new construction should be provided in response to Section X.E. below.

☑ Not applicable to this program because no new I&R costs are needed to implement or sustain the program through Year 5

E. If a new capital expenditure for instructional or research space is required, indicate where this item appears on the university's fixed capital outlay priority list. Appendix A – Table 3A or 3B includes only I&R costs. If non-I&R costs, such as indirect costs affecting libraries and student services, are

expected to increase as a result of the program, describe and estimate those expenses in narrative form below. It is expected that high enrollmen programs, in particular, would necessitate increased costs in non-I&R activities.

☑ Not applicable to this program because no new capital expenditures are needed to implement or sustain the program through Year 5.

F. Describe any additional special categories of resources needed to operate the proposed program through Year 5, such as access to proprietary research facilities, specialized services, or extended travel, and explain how those projected costs of special resources are reflected in Appendix A – Table 3A or 3B.

☑ Not applicable to this program because no additional special categories of resources are needed to implement or sustain the program through Year 5.

G. Describe fellowships, scholarships, and graduate assistantships to be allocated to the proposed program through Year 5, and explain how those are reflected in Appendix A – Table 3A or 3B.

☑ Not applicable to this program because no fellowships, scholarships and/or graduate assistantships will be allocated to the proposed program through Year 5.

IX. Required Appendices

The appendices listed in tables 1 & 2 below are required for all proposed degree programs except where specifically noted. Institutions should check the appropriate box to indicate if a particular appendix is included to ensure all program-specific requirements are met. Institutions may provide additional appendices to supplement the information provided in the proposal and list them in Table 4 below.

		Supplemental	Included2	Required for Degree Program Level					
Appendix	Appendix Title	Instructions	Yes/No	Bachelors	Masters/ Specialist	Doctoral/ Professional			
A	Tables 1-4			Х	~	Х			
В	Consultant's Report and Institutional Response					х			
C	Academic Learning Compacts	Include a copy of the approved or proposed Academic Learning Compacts for the program		х					
D	Letters of Support or MOU from Other Academic Units	Required only for programs offered in collaboration with multiple academic units within the institution		Х	~	Х			
E	Faculty Curriculum Vitae			х	~	х			
F	Common Prerequisite Request Form	This form should also be emailed directly to the BOG Director of Articulation prior to submitting the program proposal to the Board office for review.		Х					
G	Request for Exemption to the 120 Credit Hour Requirement	Required only for baccalaureate degree programs seeking approval to exceed the 120 credit hour requirement		х					
Н	Request for Limited Access Status	Required only for baccalaureate degree programs seeking approval for limited access status		Х					

Table 1. Required Appendices by Degree Level

Table 2. Additional Appendices

Appendix	Appendix Title	Description			

APPENDIX A TABLE 1-A PROJECTED HEADCOUNT FROM POTENTIAL SOURCES (Baccalaureate Degree Program)

Source of Students (Non-duplicated headcount in any given year)*	Year 1 HC	Year 1 FTE	Year 2 HC	Year 2 FTE	Year 3 HC	Year 3 FTE	Year 4 HC	Year 4 FTE	Year 5 HC	Year 5 FTE
Upper-level students who are transferring from other majors within the university**	0	0	0	0	0	0	0	0	0	0
Students who initially entered the university as FTIC students and who are progressing from the lower to the upper level***	0	0	0	0	0	0	0	0	0	0
Florida College System transfers to the upper level***	0	0	0	0	0	0	0	0	0	0
Transfers to the upper level from other Florida colleges and universities***	0	0	0	0	0	0	0	0	0	0
Transfers from out of state colleges and universities***	0	0	0	0	0	0	0	0	0	0
Other (Explain)***	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0

* List projected annual headcount of students enrolled in the degree program. List projected yearly cumulative ENROLLMENTS instead of admissions.

** If numbers appear in this category, they should go DOWN in later years.

*** Do not include individuals counted in any PRIOR CATEGORY in a given COLUMN.

APPENDIX A TABLE 1-B PROJECTED HEADCOUNT FROM POTENTIAL SOURCES (Graduate Degree Program)

Source of Students (Non-duplicated headcount in any given year)*	Year 1 HC	Year 1 FTE	Year 2 HC	Year 2 FTE	Year 3 HC	Year 3 FTE	Year 4 HC	Year 4 FTE	Year 5 HC	Year 5 FTE
Individuals drawn from agencies/industries in your service area (e.g., older returning students)	5	3.5	10	7	15	10.5	20	14	20	14
Students who transfer from other graduate programs within the university**	0	0	0	0	0	0	0	0	0	0
Individuals who have recently graduated from preceding degree programs at this university	10	7	10	7	15	10.5	20	14	20	14
Individuals who graduated from preceding degree programs at other Florida public universities	5	3.5	10	7	10	7	15	10.5	15	10.5
Individuals who graduated from preceding degree programs at non-public Florida institutions	0	0	0	0	0	0	0	0	0	0
Additional in-state residents***	0	0	0	0	0	0	0	0	0	0
Additional out-of-state residents***	0	0	5	3.5	10	7	10	7	10	7
Additional foreign residents***	0	0	5	3.5	10	7	15	10.5	15	10.5
Other (Explain)***	0	0	0	0	0	0	0	0	0	0
Totals	20	14	40	28	60	42	80	56	80	56

* List projected annual headcount of students enrolled in the degree program. List projected yearly cumulative ENROLLMENTS instead of admissions.

** If numbers appear in this category, they should go DOWN in later years.

*** Do not include individuals counted in any PRIOR category in a given COLUMN.

For assistance with FTE calculation, check with UF Office of Institutional Research
APPENDIX A TABLE 3 PROJECTED COSTS AND FUNDING SOURCES

Budget Line Item	Reallocated Base* (E&G) Year 1	Enrollment Growth (E&G) Year 1	New Recurring (E&G) Year 1	New Non- Recurring (E&G) Year 1	Contracts & Grants (C&G) Year 1	Philanthropy/ Endowments Year 1	Enterprise Auxiliary Funds Year 1	Subtotal Year 1	Continuing Base** (E&G) Year 5	New Enrollment Growth (E&G) Year 5	Other*** (E&G) Year 5	Contracts & Grants (C&G) Year 5	Philanthropy/ Endowments Year 5	Enterprise Auxiliary Funds Year 5	Subtotal Year 5
Faculty Salaries and Benefits	136,964	0	0	0	0	0	0	\$136,964	411,039	0	0	0	0	0	\$411,039
A & P Salaries and Benefits	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
USPS Salaries and Benefits	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Other Personal Services	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Assistantships & Fellowships	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Library	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Expenses	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Operating Capital Outlay	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Special Categories	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Total Costs	\$136,964	\$0	\$0	\$0	\$0	\$0	\$0	\$136,964	\$411,039	\$0	\$0	\$0	\$0	\$0	\$411,039

*Identify reallocation sources in Table 3.

**Includes recurring E&G funded costs ("reallocated base," "enrollment growth," and "new recurring") from Years 1-4 that continue into Year 5.

***Identify if non-recurring.

Faculty and Staff Summary

Total Positions	Year 1	Year 5
Faculty (person- years)	0.75	1.69
A & P (FTE)	0	0
USPS (FTE)	0	0

Calculated Cost per Student FTE

	Year 1	Year 5
Total E&G Funding	\$136,964	\$411,039
Annual Student FTE	14	56
E&G Cost per FTE	\$9,783	\$7,340

Worksheet Table 3 Budget

APPENDIX A TABLE 3 PROJECTED COSTS AND FUNDING SOURCES

Table 2 Column Ex	planations	
Reallocated Base* (E&G)	1	E&G funds that are already available in the university's budget and will be reallocated to support the new program. Please include these funds in the Table 3 – Anticipated reallocation of E&G funds and indicate their source.
Enrollment Growth (E&G)	2	Additional E&G funds allocated from the tuition and fees trust fund are contingent on enrollment increases.
New Recurring (E&G)	3	Recurring funds appropriated by the Legislature to support the implementation of the program.
New Non-Recurring (E&G)	4	Non-recurring funds appropriated by the Legislature to support the implementation of the program. Please provide an explanation of the source of these funds in the budget section (section III. A.) of the proposal. These funds can include initial investments, such as infrastructure.
Contracts & Grants (C&G)	5	Contracts and grants funding available for the program.
Philanthropy Endowments	6	Funds provided through the foundation or other Direct Support Organizations (DSO) to support the program.
Enterprise Auxiliary Funds	7	Use this column for continuing education or market rate programs and provide a rationale in section III.B. in support of the selected tuition model.
Continuing Base** (E&G)	9	Includes the sum of columns 1, 2, and 3 over time.
New Enrollment Growth (E&G)	10	See explanation provided for column 2.
Other*** (E&G)	11	These are specific funds provided by the Legislature to support implementation of the program.
Contracts & Grants (C&G)	12	See explanation provided for column 5.
Philanthropy Endowments	13	See explanation provided for column 6.
Enterprise Auxiliary Funds	14	Use this column for continuing education or market rate programs and provide a rationale in section III.B. in support of the selected tuition model.

APPENDIX A TABLE 4 ANTICIPATED REALLOCATION OF EDUCATION GENERAL FUNDS*

Program and/or E&G account from which current funds will be reallocated during Year 1	Base before reallocation	Amount to be reallocated	Base after reallocation
19xx-xxxx-101-CRRNT, Department E&G Teaching			
Faculty Salary Funds	1,045,459	46,705	\$998,754
19xx-xxxx-107-CRRNT, UF Preeminence Funds			
Teaching Faculty Salary	598,696	90,259	\$508,437
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
Totals	\$1,644,155	\$136,964	\$1,507,191

* If not reallocating E&G funds, please submit a zeroed Table 4

Appendix D

Departmental Consults

CISE for 16106 - Al Systems	page 40
CISE for 16182 - Project in Al Systems	page 44
CISE for 16819 - ML for AI Systems	page 45
ECE for 16463 - Applied Deep Learning	page 48
ECE for 16819 - ML for AI Systems	page 50

Krames, Brenda

From:	Banerjee,Arunava
Sent:	Thursday, August 26, 2021 5:19 PM
To:	Nishida,Toshi; Gader,Paul D; Gilbert,Juan E; Rangarajan,Anand
Cc:	Krames,Brenda; Jacoby,Kelly
Subject:	Re: Consult for AI Systems course
Follow Up Flag:	Follow up
Flag Status:	Completed

Hi Toshi:

We have discussed this and are happy for it to move forward.

Thank you

-Arunava

From: Nishida,Toshi <nishida@eng.ufl.edu>
Sent: Thursday, August 26, 2021 11:20 AM
To: Banerjee,Arunava <arunava@ufl.edu>; Gader,Paul D <paul.gader@essie.ufl.edu>; Gilbert,Juan E <juan@ufl.edu>;
Rangarajan,Anand <anand@cise.ufl.edu>
Cc: Krames,Brenda <bkrames@phhp.ufl.edu>; Jacoby,Kelly <kajacoby@ufl.edu>
Subject: Re: Consult for AI Systems course

Would it be possible to receive a reply by tomorrow, 8/27? The original consult request occurred on June 1.

Best, Toshi

T. Nishida, Ph.D.

Associate Dean for Academic Affairs, Herbert Wertheim College of Engineering Professor, Department of Electrical and Computer Engineering Director, NSF Multi-functional Integrated System Technology (MIST) Center Member, Interdisciplinary Microsystems Group University of Florida Gainesville, FL 32611 nishida@ufl.edu http://www.img.ufl.edu and http://mist-center.org

From: Banerjee, Arunava <arunava@ufl.edu>

Sent: Wednesday, August 25, 2021 11:06 AM

To: Nishida,Toshi <nishida@eng.ufl.edu>; Gader,Paul D <paul.gader@essie.ufl.edu>; Gilbert,Juan E <juan@ufl.edu>; Rangarajan,Anand <anand@cise.ufl.edu>

Cc: Krames, Brenda < bkrames@phhp.ufl.edu>; Jacoby, Kelly < kajacoby@ufl.edu>

Subject: Re: Consult for AI Systems course

Thanks. Will do.

-Arunava

From: Nishida,Toshi <nishida@eng.ufl.edu>
Sent: Wednesday, August 25, 2021 11:02 AM
To: Gader,Paul D <paul.gader@essie.ufl.edu>; Gilbert,Juan E <juan@ufl.edu>; Rangarajan,Anand <anand@cise.ufl.edu>;
Banerjee,Arunava <arunava@ufl.edu>
Cc: Krames,Brenda <bkrames@phhp.ufl.edu>; Jacoby,Kelly <kajacoby@ufl.edu>
Subject: Re: Consult for AI Systems course

Dear Arunava, cc: Juan,

I am forwarding an email that was sent to Christina that should be sent to you since you are taking over as CISE representative to the HWCOE Curriculum Committee while Christina is on sabbatical.

Could you please take a look at the email string below?

Thanks,

Toshi

T. Nishida, Ph.D.

Associate Dean for Academic Affairs, Herbert Wertheim College of Engineering Professor, Department of Electrical and Computer Engineering Director, NSF Multi-functional Integrated System Technology (MIST) Center Member, Interdisciplinary Microsystems Group University of Florida Gainesville, FL 32611 nishida@ufl.edu http://www.img.ufl.edu and http://mist-center.org

From: Nishida,Toshi <nishida@eng.ufl.edu>
Sent: Wednesday, August 25, 2021 9:49 AM
To: Gader,Paul D <paul.gader@essie.ufl.edu>; Gardner-McCune,Christina <gmccune@ufl.edu>; Gilbert,Juan E
<juan@ufl.edu>; Rangarajan,Anand <anand@cise.ufl.edu>
Cc: Krames,Brenda <bkrames@phhp.ufl.edu>; Jacoby,Kelly <kajacoby@ufl.edu>
Subject: Re: Consult for AI Systems course

Dear Christina, Juan,

I wanted to follow up since the first curriculum committee meeting is coming up soon next week.

Could you please reply to the consult request for the Artificial Intelligence Systems course (syllabus attached)? The main purpose of the consult is receive feedback that could improve the course. The systems aspect of the AI Systems course should make the course complementary.

Thanks, Toshi

T. Nishida, Ph.D.

Associate Dean for Academic Affairs, Herbert Wertheim College of Engineering Professor, Department of Electrical and Computer Engineering Director, NSF Multi-functional Integrated System Technology (MIST) Center

From: Gader,Paul D <paul.gader@essie.ufl.edu>
Sent: Wednesday, June 16, 2021 12:32 PM
To: Gardner-McCune,Christina <gmccune@ufl.edu>; Gilbert,Juan E <juan@ufl.edu>; Rangarajan,Anand <anand@cise.ufl.edu>
Cc: Nishida,Toshi <nishida@eng.ufl.edu>; Krames,Brenda <bkrames@phhp.ufl.edu>
Subject: Re: Consult for AI Systems course

Hi Christina, Juan, and Anand,

I can't find an email responding to this. We are all busy in the summer but I hope we can get the consult finalized. I'd be happy to talk with someone about it in the next 1.5 weeks. After that I'll be in North Carolina for 3 week.

Thanks and hope you are having a great summer!

Paul Gader, IEEE Fellow Dean's Harris Endowed Professor Computer & Info Sci & Eng (CISE) Eng School Sustainable Infrastructure & Environment (ESSIE) University of Florida Office: Weil Hall 575L

Email: pgader@ufl.edu Website: https://faculty.eng.ufl.edu/computing-for-life (C) 352-262-4267

From: Gader,Paul D <paul.gader@essie.ufl.edu>
Date: Tuesday, June 1, 2021 at 10:13
To: Gardner-McCune,Christina <gmccune@ufl.edu>, Gilbert,Juan E <juan@ufl.edu>, Rangarajan,Anand
<anand@cise.ufl.edu>
Cc: Nishida,Toshi <nishida@eng.ufl.edu>, Krames,Brenda <bkrames@phhp.ufl.edu>, Zare, Alina
<azare@ece.ufl.edu>, Rashidi,Parisa <parisa.rashidi@bme.ufl.edu>
Subject: Re: Consult for AI Systems course

Forgot to attach documents...

Paul Gader, IEEE Fellow Dean's Harris Endowed Professor Computer & Info Sci & Eng (CISE) Eng School Sustainable Infrastructure & Environment (ESSIE) University of Florida

Office: Weil Hall 575L

From: Gader,Paul D <paul.gader@essie.ufl.edu>
Date: Tuesday, June 1, 2021 at 09:54
To: Gardner-McCune,Christina <gmccune@ufl.edu>, Gilbert,Juan E <juan@ufl.edu>,
Rangarajan,Anand <anand@cise.ufl.edu>
Cc: Nishida,Toshi <nishida@eng.ufl.edu>, Krames,Brenda <bkrames@phhp.ufl.edu>, Zare, Alina <azare@ece.ufl.edu>, Rashidi,Parisa <parisa.rashidi@bme.ufl.edu>
Subject: Consult for AI Systems course

Good morning Christina, Juan, and Anand,

Please see attached for the requested consult and supporting documents. Thank you

Paul Gader, IEEE Fellow Dean's Harris Endowed Professor Computer & Info Sci & Eng (CISE) Eng School Sustainable Infrastructure & Environment (ESSIE) University of Florida

Email: <u>pgader@ufl.edu</u> Website: <u>https://faculty.eng.ufl.edu/computing-for-life</u> (C) 352-262-4267

Krames, Brenda

From:	Banerjee,Arunava
Sent:	Tuesday, October 12, 2021 4:06 PM
То:	Krames,Brenda; Gilbert,Juan E
Cc:	Jacoby,Kelly; Gader,Paul D; Nishida,Toshi
Subject:	Re: Follow-Up: Requesting Consult for Project in Al Systems

The CISE curriculum committee has looked at the course "Project in Artificial Intelligence Systems.". It has no concerns.

Sincerely,

-Arunava

From: Krames,Brenda <bkrames@phhp.ufl.edu>
Sent: Tuesday, October 12, 202111:16 AM
To: Banerjee,Arunava <arunava@ufl.edu>; Gilbert,Juan E <juan@ufl.edu>
Cc: Jacoby,Kelly <kajacoby@ufl.edu>; Gader,Paul D <paul.gader@essie.ufl.edu>; Nishida,Toshi <nishida@eng.ufl.edu>
Subject: Follow-Up: Requesting Consult for Project in Al Systems

On behalf of Paul Gader

To: Arunava Banjerjee, Juan Gilbert Fm: Paul Gader, Chair M.S. in Artificial Intelligence Systems Re: Consult for Project in Artificial Intelligence Systems

As you know, a college-wide committee was formed this academic year to create a curriculum for an M.S. in Applied Artificial Intelligence. The degree program requires a project course to develop problem solving skills related to building Al systems.

I am writing on behalf of the committee to request a consult with CISE's department on a new course titled, *Project in Artificial Intelligence Systems.* The proposed curriculum is attached for your review.

Thank you!

Paul Gader, IEEE Fellow Dean's Harris Endowed Professor Computer & Info Sci & Eng (CISE) Eng School Sustainable Infrastructure & Environment (ESSIE) University of Florida

Office: Weil Hall 575L Email: pgader@ufl.edu Website: https://faculty.eng.ufl.edu/computing-for-life (C) 352-262-4267

Krames,Brenda

From:	Rashidi, Parisa
Sent:	Wednesday, December 15, 2021 9:31 AM
То:	Krames,Brenda
Subject:	RE: Consult for Machine Learning for AI Systems
Follow Up Flag:	Follow up
Flag Status:	Flagged

Brenda,

We have not heard anyone having any issues, so let's include this email as our consultation evidence. Thanks, Parisa

Parisa Rashidi

Associate Professor, UF Term Professor, Pruitt Family Endowed Fellow, Co-Director, Intelligent Critical Care Center (IC3), Director, Intelligent Health Lab, PO Box 116130, Gainesville, FL 32611 New Engineering Building (NEB), 459 Office: (352)-392-9469 Pronouns: She/her Website: <u>http://www.bme.ufl.edu/labs/rashidi/</u> Google Scholar: <u>https://scholar.google.com/citations?user=Rtej0FIAAAAJ&hl=en</u>

From: Gilbert,Juan E <juan@ufl.edu>
Sent: Wednesday, December 8, 2021 11:08 AM
To: Rashidi,Parisa <parisa.rashidi@bme.ufl.edu>
Cc: Rangarajan,Anand <anand@cise.ufl.edu>; Gardner-McCune,Christina <gmccune@ufl.edu>; Nishida,Toshi
<nishida@eng.ufl.edu>; Krames,Brenda <bkrames@phhp.ufl.edu>; Banerjee,Arunava <arunava@ufl.edu>; Huang,Kejun
<kejun.huang@ufl.edu>; Bindschaedler, Vincent <vbindschaedler@ufl.edu>
Subject: Re: Consult for Machine Learning for AI Systems

Parisa, I haven't gotten any feedback. CISE folks, if you have any feedback, please share it now. Otherwise, I don't think we have any issues.

Thanks,

Juan E. Gilbert, Ph.D. Andrew Banks Family Preeminence Endowed Professor & Chair Computer & Information Science & Engineering Department Herbert Wertheim College of Engineering University of Florida P.O. Box 116120 On Dec 8, 2021, at 10:46 AM, Rashidi, Parisa parisa.rashidi@bme.ufl.edu> wrote:

Hi Juan,

I hope all is well. I wanted to follow up on the consultation request. Please let us know if you need anything on our side so we can move this forward.

Best, Parisa

From: Gilbert,Juan E <juan@ufl.edu>
Sent: Monday, November 29, 2021 2:10 PM
To: Rashidi,Parisa <parisa.rashidi@bme.ufl.edu>
Cc: Rangarajan,Anand <anand@cise.ufl.edu>; Gardner-McCune,Christina gmccune@ufl.edu>;
Nishida,Toshi <<u>nishida@eng.ufl.edu</u>>; Krames,Brenda <<u>bkrames@phhp.ufl.edu</u>>; Banerjee,Arunava
<<u>arunava@ufl.edu</u>>; Huang,Kejun <<u>kejun.huang@ufl.edu</u>>; Bindschaedler, Vincent
<<u>vbindschaedler@ufl.edu</u>>
Subject: Re: Consult for Machine Learning for AI Systems

Hi Parisa! It's good to hear from you. I hope you are doing well.

We will take a look at this and get back with you.

Thanks,

Juan E. Gilbert, Ph.D. Andrew Banks Family Preeminence Endowed Professor & Chair Computer & Information Science & Engineering Department Herbert Wertheim College of Engineering University of Florida P.O. Box 116120 Gainesville, FL 32611 352.392.1527 (V) 352.273.0738 (F) juan@ufl.edu Twitter: @DrJuanGilbert http://www.juangilbert.com/

On Nov 29, 2021, at 1:37 PM, Rashidi, Parisa <<u>parisa.rashidi@bme.ufl.edu</u>> wrote:

Hi Christina, Juan, and Anand,

As you know, we are working towards the approval process of the curriculum for M.S. in Applied Artificial Intelligence. On behalf of the committee, I am seeking your advice on a new course, entitled "Machine Learning for AI Systems." The course will be one of the core courses. The focus of the course is an introduction to "applied" machine learning. Please see attached for the requested consult and supporting documents. Thanks for your support!

Best,

Parisa

Parisa Rashidi

Associate Professor, UF Term Professor, Pruitt Family Endowed Fellow, Co-Director, Intelligent Critical Care Center (IC3), Director, Intelligent Health Lab, PO Box 116130, Gainesville, FL 32611 New Engineering Building (NEB), 459 Office: (352)-392-9469 Pronouns: She/her Website: <u>http://www.bme.ufl.edu/labs/rashidi/</u> Google Scholar: <u>https://scholar.google.com/citations?user=Rtej0FIAAAAJ&hl=en</u>

Krames,Brenda

From:	Harris,John Gregory
Sent:	Friday, December 17, 2021 12:13 PM
То:	Rashidi, Parisa
Cc:	Fox,Robert M; Zare, Alina; Nishida,Toshi; Krames,Brenda
Subject:	Re: Request for consult on revised Syllabus for proposed Applied Deep Learning
Follow Up Flag:	Follow up
Flag Status:	Flagged

Dear Parisa,

Thank you for leading the charge on the AI systems MS degree and these new courses. Your work is much appreciated!

ECE is OK with this course with the one caveat that the prerequisite be the newly proposed Applied ML course and not:

Prereq: One (1) of three ML course options: CAP 6610, EEL 5840, or ABE 6933 Coreq: - N/A

My faculty already pointed out the recursive vs. recurrent typo. Finally, as you know, our faculty suggest that the course should be less ambitious and include fewer topics. This is just a suggestion and you can do with it what you like.

John

John G. Harris, Professor and Chair Department of Electrical and Computer Engineering 216 Larsen Hall, P.O. Box 116200 University of Florida, Gainesville, FL 32611-6200 www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913

On Dec 6, 2021, at 8:29 AM, Krames, Brenda <<u>bkrames@phhp.ufl.edu</u>> wrote:

On behalf of Dr. Parisa Rashidi, Chair of MS in Artificial Intelligence Systems

To: Robert Fox, Alina Zare, John J. Harris **Re: Consult for course**

Thank you so much for your valued input on the proposed Applied Deep Learning course. Based upon previous discussions, the committee has revised the syllabus for EGN-6XXX Applied Deep Learning and seeks ECE's course approval.

When compared to the theoretically grounded introduction of deep learning courses currently offered by ECE/CISE, the purpose of this new course is to offer an "applied" perspective on deep learning with an emphasis on using tools and libraries and real-world use cases. Students can choose one of several courses - with Fundamentals of ML being just one many options. A list of available instructors has been added to the syllabus.

The description is below, and the syllabus is attached.

We look forward to your response!

Course Description

Covers the concepts, frameworks, and tools used for building deep learning models. It will also examine applications of deep learning systems in AI involving topics such as computer vision, natural language processing (NLP), speech recognition, sensor signal analysis, and security. (3 credit hours)

Course Pre-Requisites / Co-Requisites

Prereq: One (1) of three ML course options: CAP 6610, EEL 5840, or ABE 6933 Coreq: - N/A

Brenda Krames

Administrative Assistant II 352.273.6155 | HPNP 3152 | <u>bkrames@phhp.ufl.edu</u> <image002.jpg>

<EGN-6XXX-Applied-Deep-Learning-Revised (1).pdf>

Krames,Brenda

From:	Harris,John Gregory
Sent:	Friday, December 3, 2021 6:07 PM
То:	Rashidi, Parisa
Cc:	Fox,Robert M; Zare, Alina; Nishida,Toshi; Krames,Brenda; Catia S. Silva
Subject:	Re: Consult for Machine Learning for AI Systems
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hi Parisa,

ECE approves this course. Thank you for leading this effort. I CCed Catia on this email since she may be the one who will end up teaching it.

One optional suggestion is to avoid listing particular algorithms in the course description since this list will change over time. It may be better to list general categories since these are less likely to change. Catia suggested the following course description:

(3 credits) This course aims to provide an iterative framework to develop real-world machine learning systems that are deployed, reliable, and scalable. The focus of this course is to introduce basic modules of machine learning systems, namely, data management, data engineering, approaches to model selection, training, scaling, monitoring and deploying to ML systems.

In any case, this is only a suggestion. Do with it what you wish. We approve this course.

John

John G. Harris, Professor and Chair Department of Electrical and Computer Engineering 216 Larsen Hall, P.O. Box 116200 University of Florida, Gainesville, FL 32611-6200 www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913

On Nov 29, 2021, at 1:41 PM, Rashidi, Parisa <<u>parisa.rashidi@bme.ufl.edu</u>> wrote:

Hi John, Rob,

As you know, we are working towards the approval process of the curriculum for M.S. in Applied Artificial Intelligence. Based on our previous discussions, we have developed the syllabus for a new course, entitled "Machine Learning for AI Systems." The focus of the course is an introduction to "applied" machine learning.

Alina has already reviewed the syllabus, but a formal consult response must also be included in the approval system. Please see attached for the requested consult and supporting documents. Thank you!

Best, Parisa

Parisa Rashidi

Associate Professor, UF Term Professor, Pruitt Family Endowed Fellow, Co-Director, Intelligent Critical Care Center (IC3), Director, Intelligent Health Lab, PO Box 116130, Gainesville, FL 32611 New Engineering Building (NEB), 459 Office: (352)-392-9469 Pronouns: She/her Website: <u>http://www.bme.ufl.edu/labs/rashidi/</u> Google Scholar: <u>https://scholar.google.com/citations?user=Rtej0FIAAAAJ&hl=en</u>

<Consult-Machine Learning for AI Systems-ECE.pdf><EGN 5XXX Machine Learning for AI Systems.pdf>

Appenidix E

Committee Member CV's

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Revised 05/01/2020

NAME: Nikolay Bliznyuk

POSITION TITLE & INSTITUTION: Associate Professor of Statistics, University of Florida

A. PROFESSIONAL PREPARATION (see <u>PAPPG Chapter II.C.2.f.(i)(a)</u>)

INSTITUTION	LOCATION	MAJOR/AREA OF STUDY	DEGREE (if applicable)	YEAR (YYYY)
George Mason University	Fairfax, VA	Economics	B.S.	2001
Cornell University	Ithaca, NY	Operations Research	M.S.	2007
Cornell University	Ithaca, NY	Operations Research	Ph.D.	2008
Harvard School of Public Health	Boston, MA	Biostatistics	Postdoc	2009

B. APPOINTMENTS (see PAPPG Chapter II.C.2.f.(i)(b))

From - To	Position Title, Organization and Location
2018-present:	Associate Professor of Statistics (tenured), Department of Agricultural and Biological
	Engineering, University of Florida, Gainesville, FL
2015-present:	Affiliate/Courtesy Professor, University of Florida Informatics Institute, Gainesville, FL
2014-present:	Affiliate/Courtesy Professor, Department of Statistics, University of Florida, Gainesville, FL
2012-present:	Affiliate/Courtesy Professor, Department of Biostatistics, University of Florida, Gainesville,
	FL
2012-present:	Affiliate/Courtesy Professor, School of Natural Resources & Environment (Interdisciplinary
	Ecology), University of Florida, Gainesville, FL
2014-18:	Assistant Professor of Statistics, Department of Agricultural and Biological Engineering,
	University of Florida, Gainesville, FL
2011-14:	Assistant Professor, Department of Statistics, University of Florida, Gainesville, FL
2009-11:	Research Assistant Professor, Department of Statistics, Texas A&M University, College
	Station, TX
2008-09:	Postdoctoral Fellow, Department of Biostatistics, Harvard School of Public Health, Boston,
	МА

BS-1 of 2

C. PRODUCTS

(see <u>PAPPG Chapter II.C.2.f.(i)(c)</u>)

Products Most Closely Related to the Proposed Project

1. Tang, X., Yang, Y., Yu, H., Liao, Q., and Bliznyuk, N. (2019+) "A Spatio-Temporal Model for Transmission of Multiple Pathogens with Applications to Hand, Foot, and Mouth Disease in China," Journal of the American Statistical Association, (A&CS), 114:528, 1561-1573, doi.org/10.1080/01621459.2019.1585250

2. Merrill, H.R, Tang, X., Bliznyuk, N. (2019), "Spatio-Temporal Additive Regression Model Selection for Urban Water Demand", Stochastic Environmental Research & Risk Assessment, 33, doi.org/10.1007/s00477-019-01682-2

3. Duerr, I., Merrill, H.R., Wang, C., Bai, R., Boyer, M.J, Dukes, M.D., Bliznyuk N. (2018), "Forecasting Urban Household Water Demand with Statistical and Machine Learning Methods Using Large Space-Time Data: a Comparative Study", Environmental Modelling & Software, 102, 29-38,

http://doi.org/10.1016/j.envsoft.2018.01.002

4. Taylor-Rodriguez, D., Womack, A.J., Fuentes, C.M., Bliznyuk, N. (2017), "Intrinsic Bayesian Analysis for Occupancy Models", Bayesian Analysis, 12(3), 855-877, DOI: 10.1214/16-BA1014.

5. Taylor-Rodriguez, D., Womack, A., and Bliznyuk, N. (2016), "Bayesian Variable Selection on Model Spaces Constrained by Heredity Conditions", Journal of Computational & Graphical Statistics, 25(1), 515-535, DOI: 10.1080/10618600.2015.1056793

Other Significant Products, Whether or Not Related to the Proposed Project

1. Merrill, H.R., Grunwald, S., Bliznyuk, N. (2017), "Semiparametric regression models for spatial prediction and uncertainty quantification of soil attributes", Stochastic Environmental Research & Risk Assessment, 31(10), 2691-2703, doi:10.1007/s00477-016-1337-0.

2. Bliznyuk, N., Paciorek, C., Schwartz, J., and Coull, B. A. (2014), Nonlinear Latent Process Models for Integrating Spatio-Temporal Exposure Data from Multiple Sources, minor revision requested, Annals of Applied Statistics, 8(3), 1538–1560, DOI: 10.1214/14-AOAS737

3. Bliznyuk, N., Ruppert, D., Shoemaker, C. A. (2012), "Local Derivative-Free Approximation of Computationally Expensive Posterior Densities", Journal of Computational & Graphical Statistics, 12(2), 476-495.

 Bliznyuk, N., Ruppert, D., Shoemaker, C. A. (2011), "Efficient Interpolation of Computationally Expensive Posterior Densities with Variable Parameter Costs", Journal of Computational & Graphical Statistics, 20, 636-655.
 Bliznyuk, N., Ruppert, D., Shoemaker, C. A., Regis, R., Wild, S., Mugunthan, P. (2008), "Bayesian Calibration

D. SYNERGISTIC ACTIVITIES

(see <u>PAPPG Chapter II.C.2.f.(i)(d)</u>)

• I co-chaired the curriculum committee for a new MS degree in Artificial Intelligence Systems at UF

• I developed, revised and distributed UF HPC tutorials specifically aimed at large-scale deployment and application of computationally intensive statistical methods.

• I maintain a web page to facilitate dissemination of my research, including published articles, preprints, software products and training materials (e.g., UF HPC tutorials mentioned above).

• I developed a 9-day workshop "Boot Camp in Statistical Methods for Genetics" that I taught twice, in 2012-13

• Since Fall 2011, I have been extensively involved in statistical consulting across UF helping with experimental design and data analytic, predictive modeling and computational strategies.

BS-2 of 2

PAUL D. GADER IEEE Fellow Dean's Harris Professor University of Florida Research Foundation Professor (2012 – 2015)

pgader@ufl.edu

EDUCATION

Ph.D. in **Mathematics**, University of Florida, August 1986. Dissertation: Image Algebra Techniques for Parallel Computation of Discrete Fourier and General Linear Transforms

M.S. in Mathematics, University of Florida, May 1983.

B.S. in Mathematics, University of Central Florida, August 1981, magna cum laude.

POSITIONS HELD

2003-Present	Professor of Computer & Information Science & Engineering University of Florida.			
2016-Present	Affiliate Professor, Environmental Engineering Sciences University of Florida			
08/15-06/16	Visiting Professor of Computer Science and Geography University of California, Santa Barbara			
05/12 - 05/15	Chair and Professor of Computer & Information Science & Engineering University of Florida			
2001-2003	Associate Professor of Computer & Information Science & Engineering University of Florida.			
1991-2001	Assistant / Associate / Full Professor of Computer Engineering & Computer Science, (formerly Electrical & Computer Engineering), University of Missouri-Columbia.			
1994	Summer Research Fellow, Image Processing Laboratory, Eglin AFB FL.			
1991-1994	Consultant, Environmental Research Institute of Michigan (ERIM).			
1989-1991	Section Head and Research Engineer, Image & Pattern Analysis Section, ERIM.			
1988	Summer Research Fellow, Institute for Mathematics and Its Applications, Summer Program on Signal Processing, University of Minnesota.			
1987-1988	Assistant Professor of Mathematics, University of Wisconsin-Oshkosh.			
1986-1988	Senior Research Scientist, Machine Vision Technology Section, Honeywell Systems and Research Center.			
1986-1988	Honorary Fellow, Department of Mathematics, University of Wisconsin-Madison.			
1986	Visiting Assistant Professor of Mathematics, University of Wisconsin-Oshkosh.			
1984-1986	Graduate Research Assistant, Computer & Information Science Department, University of Florida.			
1984	Summer Research Fellow, Image Processing Laboratory, Eglin AFB, FL.			
1981-1984	Graduate Teaching Assistant, Department of Mathematics, University of Florida.			

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PUBLICATIONS

REFEREED JOURNAL ARTICLES (110 published/accepted)

(J1) P. Chen, Y. Liang, X. Shi, L. Yang, P. Gader, "Automatic Whole Slide Pathology Image Diagnosis Framework via Unit Stochastic Selection and Attention Fusion", *Neurocomputing* (Accepted, May 2020)

(J2) P. Chen, X. Shi, Y., Liang, Y. Li, L. Yang, P. Gader, "Interactive thyroid whole slide image diagnostic system using deep representation", *Computer Methods and Programs in Biomedicine*, 195, 105630 (2020), https://doi.org/10.1016/j.cmpb.2020.105630

(J3) Dennison, P. E., Qi, Y., Meerdink, S. K., Kokaly, R. F., Thompson, D. R., Daughtry, C. S. T., Quemada, M., Roberts, D.A., **Gader, P.D.**, Wetherley, E.B., Numata, I., & Roth, K. L. (2019). "Comparison of methods for modeling fractional cover using simulated satellite hyperspectral imager spectra", *Remote Sensing*, 11(2072), 1–23. <u>https://doi.org/10.3390/rs11182072</u>

(J4) Meerdink, S.K., Roberts, D.A., Roth, K.L., King, J.Y., Gader, P.D., & Koltunov, A "Classifying California plant species temporally using airborne hyperspectral imagery", *Remote Sensing of Environment*, 232, . (2019).<u>https://doi.org/10.1016/j.rse.2019.111308</u>

(J5) Y. Zhou, E. Wetherley, and P. D. Gader, "Unmixing urban hyperspectral imagery using probability distributions to represent endmember variability", (accepted), Remote Sensing of Environment, April 2020.

(J6) Y. Zhou, A. Rangarajan and P. D. Gader, "A Gaussian Mixture Model Representation of Endmember Variability in Hyperspectral Unmixing," in *IEEE Transactions on Image Processing*, vol. 27, no. 5, pp. 2242-2256, May 2018. doi: 10.1109/TIP.2018.2795744.

(J7) M. Shuaib, W. Lee, **P.D. Gader**, J. Schueller, "Unsupervised Hyperspectral Band Selection for Apple Marssonina Blotch Detection", *Computers and Electronics in Agriculture*, vol. 148, May 2018, Pages 45-53.

(J8) S. E. Yuksel, S. Kucuk and P. D. Gader, "SPICEE: An Extension of SPICE for Sparse Endmember Estimation in Hyperspectral Imagery," *IEEE Geoscience and Remote Sensing Letters*, vol. 13, no. 12, pp. 1910-1914, Dec. 2016.

(J9) S. E. Yuksel and P. D. Gader, "Context-based classification via mixture of hidden Markov model experts with applications in landmine detection," *IET Computer Vision*, vol. 10, no. 8, pp. 873-883, 12 2016.

(J10) Y. Zhou, A. Rangarajan, and P. D. Gader, "A spatial compositional model for linear unmixing and endmember uncertainty estimation", *IEEE Transactions on Image Processing*, vol. 25, no. 12, Dec. 2016, pp. 5987 - 6002,

(J11) L. Kalantari, P. D. Gader, S. Graves, S. Bohlman, "One-Class Gaussian Process for Possibilistic Classification Using Imaging Spectroscopy", *IEEE Geoscience and Remote Sensing Letters* 13.7 June 2016, 967-971.

(J12) R. Heylen, A. Zare, P. D. Gader and P. Scheunders, "Hyperspectral Unmixing With Endmember Variability via Alternating Angle Minimization," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 54, no. 8, pp. 4983-4993, May 2016.

(J13) S. Yuksel, J. Bolton, P. D. Gader, "Multiple Instance Hidden Markov Models with Applications to Landmine Detection", IEEE Transactions Geoscience and Remote Sensing, vol. 53, no. 12, Dec. 2015

(J14) Nia, M. S., Wang, D. Z., Bohlman, S. A., Gader, P., Graves, S. J., & Petrovic, M. (2015), "Impact of atmospheric correction and image filtering on hyperspectral classification of tree species using support vector machine". *Journal of Applied Remote Sensing*, 9(1), Nov. 2015.

(J15) T. Glenn, A. Zare, P. D. Gader, "Bayesian Fuzzy Clustering," *IEEE Transactions on Fuzzy Systems*, vol. 23, no. 5, Oct. 2015.

(J16) R. Heylen, P. Scheunders, P. D. Gader, and A. Rangarajan, "Nonlinear unmixing by using different metrics in a linear unmixing chain", *IEEE-JSTARS, Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol.8, no.6, pp.2655-2664, June 2015.

(J17) Rob Heylen and P. D. Gader, "Nonlinear Spectral Unmixing With a Linear Mixture of Intimate Mixtures Model,", *IEEE Geoscience & Remote Sensing Letters*, vol. 7, no. 11, pp:1195-1199, July 2014.

(J18) A. Zare, J. Bolton, J. Chanussot, P.D. Gader, "Foreword to the Special Issue on Hyperspectral Image and Signal Processing," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 7, no. 6, pp. 1841-1843, June 2014.

(J19) R. Heylen, M. Parente, P.D. Gader, "A Review of Nonlinear Hyperspectral Unmixing Methods," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol.7, no. 6, pp. 1844-1868, June 2014.

(J20) Xiaoxiao Du, A. Zare, P.D. Gader, D. Dranishnikov, "Spatial and Spectral Unmixing Using the Beta Compositional Model," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 7, no. 6, June 2014

(J21) R. Close; P. D. Gader; J. Wilson, "Hyperspectral unmixing using macroscopic and microscopic mixture models", *J. Appl. Remote Sens.* 8 (1), 083642, April 2014; doi: 10.1117/1.JRS.8.08364

(J22) Xuping Zhang, J.Bolton, P. D. Gader, "A New Learning Method for Continuous Hidden Markov Models for Subsurface Landmine Detection in Ground Penetrating Radar," *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol.7, no.3, pp.813:819, March 2014

(J23) Wing-Kin Ma, J.M. Bioucas-Dias, J. Chanussot, **P.D. Gader**, "Signal and Image Processing in Hyperspectral Remote Sensing [From the Guest Editors]," *IEEE Signal Processing Magazine*, vol.31, no. 1, pp. 22-23, Jan. 2014.

(J24) Ma, W.-K.; Bioucas-Dias, J.M.; Tsung-Han Chan; Gillis, N.; P. D. Gader, P.; Plaza, A.J.; Ambikapathi, A.; Chong-Yung Chi, "A Signal Processing Perspective on Hyperspectral Unmixing: Insights from Remote Sensing," IEEE *Signal Processing Magazine*, vol.31, no.1, pp.67,81, Jan. 2014.

(J25) Yang, Ce, Won Suk Lee, and P. D. Gader. "Hyperspectral band selection for detecting different blueberry fruit maturity stages." Computers and Electronics in Agriculture 109 (2014): 23-31.

(J26) Alina Zare, P. D. Gader, O. Bchir, and H., Frigui "Piece-wise Convex Multiple Model Endmember Detection and Spectral Unmixing", *IEEE Trans. Geoscience and Remote Sensing*, vol. 51, no. 5, pp. 2853 - 2862, July, 2013.

(J27) Seniha Esen Yuksel, Thierry Dubroca, Rolf E. Hummel, and **P D. Gader**. "Differential reflection spectroscopy: A novel method for explosive detection." Acta Phys. Pol. A 123, no. 2 (2013): 263-264.

(J28) Alina Zare, P. D. Gader, G. Casella, "Sampling Piece-wise Convex Unmixing and Endmember Extraction", *IEEE Trans. Geoscience and Remote Sensing*, vol.51, no. 3, 2013, pp. 1655-1665, March, 2013.

(J29) Achmed Abdallah, H. Frigui, P. D. Gader, "Adaptive Local Fusion with Fuzzy Integrals", *IEEE Trans. Fuzzy Systems*, vol. 20, no. 5, pp. 849-864, Oct. 2012.

(J30) S. Yuksel, J. Wilson, and P. D. Gader, "Twenty Years of Mixture of Experts", *IEEE Transactions on Neural Networks and Learning Systems*, vol. 23, no. 8, p.1177-1193, May, 2012.

(J31) Alina Zare, P. D. Gader, and K. S. Gurumoorthy, "Directly Measuring Material Proportions Using Hyperspectral Compressive Sensing", *Geoscience and Remote Sensing Letters*, vol.9, no.3, pp.323-327, May 2012

(J32) H. Frigui, L. Zhang, P. D. Gader, Joseph N. Wilson, K C Ho, and Andres Mendez-Vazquez "An Evaluation of Several Fusion Algorithms for Anti-tank Landmine Detection and Discrimination", *Information Fusion* Vol. 13, Issue 2, April 2012, Pages 161–174.

(J33) J. Bioucas-Dias, A. Plaza, N. Dobigeon, M. Parente, Q. Due, P. D. Gader, J. Chanussot, "Hyperspectral Unmixing Overview: Geometrical, Statistical, and Sparse Regression-Based Approaches", *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, Vol. 5, No. 2, pp: 354 – 379, April, 2012.

(J34) J. Bolton and P. D. Gader, "Application of Multiple Instance Learning for Hyperspectral Image Analysis", *Geoscience and Remote Sensing Letters*, Vol. 8, No. 5, Sept. 2011, pp. 889-893.

(J35) J. Bolton, P. D. Gader, Hichem Frigui, Pete Torrione, "Random Set Framework for Multiple Instance Learning", *Journal of Information Sciences*, Volume 181, Issue 11, 1 June 2011, Pages 2061-2070.

(J36) O. Missaoui, H. Frigui, and P. D. Gader, "Landmine Detection with Ground Penetrating Radar using Multi-Stream Discrete Hidden Markov Models", *IEEE Trans. Geoscience and Remote Sensing*, Volume 49, Issue 6, June 2011, pp. 2080-2099

(J37) G. Heo, P. D. Gader, "Robust Kernel Discriminant Analysis using Fuzzy Memberships", *Pattern Recognition*, Volume 44, Issue 3, March 2011, Pages 716-723.

(J38) Alina Zare and P. D. Gader, "PCE: Piece-wise Convex Endmember Detection" *IEEE Trans. Geoscience and Remote Sensing*, Vol. 48, No. 6, June 2010, pp. 2620-2632.

(J39) H. Frigui, L. Zhang, P. D. Gader, "Context Dependent Multi-Sensor Fusion and its Application to Land Mine Detection", *IEEE Trans. Geoscience and Remote Sensing*, Vol. 48, No. 6, June 2010, pp. 2528 – 2543.

(J40) G. Ramachandran, P. D. Gader, J. N. Wilson, "GRANMA: Gradient Angle Model Algorithm on Wideband EMI data for Landmine Detection", *Geoscience and Remote Sensing Letters*, Vol. 7, No. 3, July 2010, pp. 535-539.

(J41) J. Bolton, P. D. Gader, "Random Set Framework for Context-Based Classification with Hyperspectral Imagery", *IEEE Trans. Geoscience and Remote Sensing*, Vol. 47, No. 11, Nov. 2009, Page(s): 3810-3821.

(J42) J. McElroy and P. D. Gader, "Generalized Encoding and Decoding Operators for Lattice Based Associative Memories" *IEEE Transactions on Neural Networks*, Vol. 20, No. 10, October 2009, Page(s): 1674-1679.

(J43) R. Mazhar, P. D. Gader, J. N. Wilson, "Matching Pursuits Dissimilarity Measure for Shape-Based Comparison and Classification of High-dimensional Data", *IEEE Trans. Fuzzy Systems*, Vol. 17, No. 5, Oct. 2009, Page(s): 1175-1189.

(J44) G. Heo, P. D. Gader, and H. Frigui, "RKF-PCA: Robust kernel fuzzy PCA", *Neural Networks*, Vol. 22, No. 5-6, July 2009, Page(s): 642-650.

(J45) H. Frigui and P. D. Gader, "Detection and discrimination of land mines in ground-penetrating radar based on edge histogram descriptors and a Possibilistic K-Nearest Neighbor Classifier", *IEEE Trans. Fuzzy Systems*, Volume 17, Issue 9, March 2009, Page(s) 185-199.

(J46) J. Bolton, P. D. Gader, J. N. Wilson, "Discrete Choquet Integral as a Distance Metric", *IEEE Trans. Fuzzy Systems* Volume 16, Issue 4, Aug. 2008 Page(s):1107 - 1110.

(J47) Alina Zare and P. D. Gader, "Hyperspectral Band Selection and Endmember Detection Using Sparsity Promoting Priors", *IEEE Geoscience and Remote Sensing Letters*, Vol. 5, No. 2, April 2008, pp. 256-261.

(J48) K. C. Ho, L. Carin, P. D. Gader, J. N. Wilson, "An Investigation of Using the Spectral Characteristics from Ground Penetrating Radar for Landmine/Clutter Discrimination", *IEEE Trans. Geoscience and Remote Sensing*, Vol. 46, No. 4, April 2008, pp. 1177-1192.

(J49) Andres Mendez-Vazquez, P. D. Gader, J. M. Keller, K. Chamberlin, "Minimum Classification Error Training for Choquet Integrals with Applications to Landmine Detection", *IEEE Trans. Fuzzy Systems*, Vol. 16, No. 1, Feb. 2008, pp. 225-239.

(J50) Alina Zare, J. Bolton, P. D. Gader, M. Schatten, "Vegetation Mapping for Landmine Detection Using Long-Wave Hyperspectral Imagery", *IEEE Trans. Geoscience and Remote Sensing*, Volume 46, Issue 1, Jan. 2008, pp.:172 – 178.

(J51) J. N. Wilson, P. D. Gader, W.-H. Lee, H. Frigui, and K. C. Ho, "A Large-Scale Systematic Evaluation of Algorithms Using Ground Penetrating Radar for Landmine Detection and Discrimination", *IEEE Trans. Geoscience and Remote Sensing*, Vol. 45, No. 8, pp. 2560-2573, August 2007.

(J52) Alina Zare and P. D. Gader, "Sparsity Promoting Iterated Endmember Detection in Hyperspectral Imagery", *IEEE Geoscience and Remote Sensing Letters*, Vol.4, No. 3, pp. 446-451, July 2007.

(J53) R. Joe Stanley, K.C. Ho, P.D.Gader, J. N. Wilson, James Devaney, "Land Mine and Clutter Object Discrimination Using Wavelet and Time Domain Spatially Distributed Features from Metal Detector and Their Fusion with GPR Features for Hand-Held Units", *Circuits Systems and Signal Processing*, Vol. 26, No. 2, pp. 165-191, April 2007.

(J54) T. Wang, J. Keller, P. D. Gader, and O. Sjahputera, "Frequency Subband Processing and Feature Analysis of Forward-Looking Ground Penetrating Radar Signals for Land Mine Detection", *IEEE Trans Geoscience and Remote Sensing*, Volume 45, Issue 3, pp. 718-729, March 2007.

(J55) W-H. Lee, P. D. Gader, J. N. Wilson, "Optimizing the Area under a Receiver Operating Characteristic Curve with Application to Landmine Detection", *IEEE Trans. Geoscience and Remote Sensing*, vol. 45, No. 2, pp. 389-398, Feb. 2007.

(J56) M. Popescu, P. D. Gader, and J. M. Keller, "Fuzzy Spatial Pattern Processing Using Linguistic Hidden Markov Models", *IEEE Trans. Fuzzy Systems*, Vol. 14, No. 1, pp. 81-92, Feb. 2006.

(J57) H. Frigui, K.C. Ho and P. D. Gader, "Real-time Land Mine Detection with Ground Penetrating Radar using Discriminative and Adaptive Hidden Markov Models" *EURASIP Journal on Applied Signal Processing*, Vol. 2005, No. 12, pp. 1867-1885, July 2005.

(J58) P. D. Gader, W-H Lee, J. N. Wilson, "Detecting Landmines with Ground Penetrating Radar using Feature-Based Rules Order Statistics, and Adaptive Whitening", *IEEE Trans. Geoscience and Remote Sensing*, vol. 42, No. 11, pp. 2522-2534, Nov. 2004.

(J59) T. Wang, J. M. Keller, P. D. Gader, A. K. Hocaoglu, "Phase Signatures in Acoustic-Seismic Landmine Detection", *Radio Science*, vol. 39, pp. RS4S02/1-13, July 2004.

(J60) K. C. Ho, L. M. Collins, L. G. Huettel, P. D. Gader, Discrimination Mode Processing for EMI and GPR sensors for Hand-Held Land Mine Detection, *IEEE Trans. Geoscience and Remote Sensing*, Vol. 42, No. 1, pp. 249-263, Jan. 2004.

(J61) Ali K. Hocaoglu and P. D. Gader, "Domain Learning Using Choquet Integral Based Morphological Shared Weight Neural Networks", *Journal of Image and Vision Computing, special issue on Computer Vision Beyond the Visible Spectrum*, Vol. 21, No. 1, pp. 663-673, July 2003.

(J62) Y. Zhao, P. D. Gader, P. Chen, Y. Zhang, "Training DHMMs of mine and clutter to minimize landmine detection errors", *IEEE Trans. Geoscience and Remote Sensing*, Vol. 41, No. 5, pp. 1016-1024, May 2003.

(J63) Jinhui Liu and P. D. Gader, "Neural Networks with Enhanced Outlier Rejection Ability for Off-Line Handwritten Word Recognition", *Pattern Recognition* Vol. 35, No. 10, pp. 2061-2071, October, 2002.

(J64) D. DeKrugger, J. Hodge, J. C. Bezdek, J. M. Keller, and P. D. Gader, "Detecting Mobile Land Targets in LADAR Imagery with Fuzzy Algorithms", *Journal of Intelligent and Fuzzy Systems*, Vol. 10, No. 3-4, pp. 197-213, October 2002.

(J65) R. J. Stanley, P. D. Gader, D. Ho, "Feature and decision level sensor fusion of electromagnetic induction and ground penetrating radar sensors for landmine detection with hand-held units", *Information Fusion* 3(3):215-223, September 2002.

(J66) K. C. Ho and P. D. Gader, "A Linear Prediction Land Mine Detection Algorithm for Hand Held Ground Penetrating Radar", *IEEE Transactions on Geoscience and Remote Sensing*, Vol. 40, No. 6, pp. 1374-1385, June, 2002.

(J67) Ali K. Hocaoglu, P. D. Gader, J. M. Keller, and B. N. Nelson, "Anti-Personnel Land Mine Detection and Discrimination using Acoustic Data", *Journal of Subsurface Sensing Technologies and Applications*, Vol. 3, No. 2, pp. 75-93, April, 2002.

(J68) S. Auephanwirayakul, J. Keller, and P. D. Gader, "Generalized Choquet Fuzzy Integral Fusion", *Information Fusion*, Vol. 3, No. 1, pp. 69-85, March 2002.

(J69) N. Theera-Umpon and P. D. Gader, "System-Level Training of Neural Networks for Counting White Blood Cells", *IEEE Trans. Systems, Man, and Cybernetics*, Vol. 32, No. 1, pp. 48-54, February, 2002.

(J70) N. Theera-Umpon, E. R. Dougherty, and P. D. Gader, Non-Homothetic Granulometric Mixing Theory, *Pattern Recognition*, Vol. 34, No. 12, pp.2547-2560, December 2001.

(J71) B. Verma, P. D. Gader and W. Chen, "Fusion of Multiple Handwritten Word Recognition Techniques", *Pattern Recognition Letters*, Vol. 22, No. 9, pp. 991-998, July 2001.

(J72) P. D. Gader, M. Mystkowski, Y. Zhao "Landmine Detection with Ground Penetrating Radar using Hidden Markov Models," *IEEE Trans. Geoscience and Remote Sensing*, Vol. 39, No. 6, pp. 1231-1244, June 2001.

(J73) P. D. Gader, James. M. Keller, Bruce N. Nelson, "Recognition Technology for the Detection of Buried Land Mines," *IEEE Trans. Fuzzy Systems*, Vol. 9, No. 1, pp. 31-43, February 2001.

(J74) P. D. Gader, B. Nelson, H. Frigui, G. Vaillette, J. Keller, "Fuzzy Logic Detection of Landmines with Ground Penetrating Radar," *Signal Processing, Special Issue on Fuzzy Logic in Signal Processing (Invited Paper)*, Vol. 80, No. 6, pp. 1069-1084, June 2000.

(J75) P. D. Gader, M. Khabou, and A. Koldobsky, "Morphological Regularization Neural Networks," *Pattern Recognition, Special Issue on Mathematical Morphology and Its Application*, Vol. 33, No. 6, pp. 935-945, June 2000.

(J76) M. Khabou, P. D. Gader, and J. M. Keller, "LADAR Target Detection Using Morphological Shared-Weight Neural Networks", *Machine Vision and Applications*, Vol. 11 No. 6, pp. 300-305, May 2000.

(J77) N. Theera-Umpon and P. D. Gader, "Counting White Blood Cells Using Morphological Granulometries, *Journal of Electronic Imaging*, Vol. 9, No. 2, pp. 170-177, April 2000.

(J78) M. Mohamed and P. D. Gader, "Generalized Hidden Markov Models Part I: Theoretical Frameworks," *IEEE Trans. Fuzzy Systems*, Vol. 8, No. 1, pp. 67-81, February 2000.

(J79) M. Mohamed and P. D. Gader, "Generalized Hidden Markov Models Part II: Applications to Handwritten Word Recognition," *IEEE Trans. Fuzzy Systems*, Vol. 8, No. 1, pp. 82-95, February 2000.

(J80) M. Khabou and P. D. Gader, "Automatic Target Detection using Entropy-Optimized Shared Weight Neural Networks," *IEEE Trans. Neural Networks*, Vol. 11, No. 1, pp. 186-194, January 2000.

(J81) M. Popescu, P. D. Gader, J. M. Keller, C. Klein, J. Stanley, and C. Caldwell, "Automatic Karyotyping of Metaphase Cells with Overlapping Chromosomes," *Computers in Biology and Medicine*, Vol. 29, No. 1, pp. 61-82, March 1999.

(J82) M. Khabou, P. D. Gader, H. Shi, "Entropy Optimized Morphological Shared-Weight Neural Networks," *Optical Engineering*, Vol. 38, No. 2, pp. 263-273, Feb. 1999.

(J83) W. Chen, P. D. Gader, H. Shi, "Lexicon Driven Handwritten Word Recognition Using Optimal Linear Combinations of Order Statistics," *IEEE Trans. Pattern Analysis and Machine Intelligence*, Vol. 21, No. 1, pp.77-83, Jan. 1999.

(J84) R. Stanley, J. Keller, P. D. Gader, C. Caldwell," Homologue Matching Applications: Recognition of Overlapped Chromosomes," *Pattern Analysis and Applications*, Vol. 1, No. 4, pp. 206-217, 1998.

(J85) R. Stanley, J. Keller, P. D. Gader, C. Caldwell, "Data Driven Homologue Matching for Chromosome Identification," *IEEE Trans Medical Imaging*, Vol. 17, No. 3, pp. 451-463, June 1998.

(J86) H. Shi, P. D. Gader, and W. Chen, "Fuzzy Integral Filters: Properties and Parallel Implementations," *Journal of Real-Time Imaging*, Vol. 4, No. 2, pp. 233-241, April 1998.

(J87) H. Shi, P. D. Gader, and H. Li, "Parallel Mesh Algorithms for Grid Graph Shortest Paths with Application to Separation of Touching Chromosomes," *Journal of Supercomputing; Special Issue on High-Performance Computing and Applications in Computer Graphics, Image Processing and Computer Vision*, Vol. 12, pp. 69-83, 1998.

(J88) J. Chiang and P. D. Gader, "Hybrid Fuzzy-Neural Systems in Handwritten Word Recognition," *IEEE Trans. Fuzzy Systems*, Vol. 5, No. 4, pp. 497-510, Nov. 1997.

(J89) Y. Won, P. D. Gader, and P. C. Coffield, "Shared-Weight Neural Networks based on Mathematical Morphology with Applications to Automatic Target Recognition," *IEEE Trans. Neural Networks*, Vol. 8, No. 5, pp. 1195-1204, Sept. 1997.

(J90) P. D. Gader, J. M. Keller, R. Krishnapuram, J.H. Chiang, and M. Mohamed, "Neural and Fuzzy Methods in Handwriting Recognition," *IEEE Computer*, Vol. 30, No. 2, pp. 79-86, Feb. 1997.

(J91) P. D. Gader, Magdi Mohamed, and Jung-Hsien Chiang, "Handwritten Word Recognition with Character and Inter-Character Neural Networks," *IEEE Trans. Sys. Man Cybernetics*, Vol. 27, No. 1, pp. 158-165, Feb. 1997.

(J92) Jung-Hsien Chiang and P. D. Gader, Recognition of Handprinted Numerals in VISA® Card Application Forms," *Machine Vision and Applications*, Vol. 10, No. 3, pp. 144-149, Sept. 1997.

(J93) P. D. Gader, and M.A. Khabou, "Automated Feature Generation for Handwritten Digit Recognition," *IEEE Trans. Pattern Analysis and Machine Intelligence*, Vol. 18, No. 12, pp. 1256-1262, Dec. 1996.

(J94) P. D. Gader, M. Mohamed, and J. Keller, "Fusion of Handwritten Word Classifiers," *Pattern Recognition Letters*, Special Issue on Fuzzy Pattern Recognition, Vol. 17, No. 6, pp. 577-584, May 1996.

(J95) M. Mohamed and P. D. Gader, "Handwritten Word Recognition Using Segmentation-Free Hidden Markov Modeling and Segmentation-Based Dynamic Programming Techniques," *IEEE Trans. Pattern Analysis and Machine Intelligence*, Vol. 18, No. 5, pp. 548-554, May 1996.

(J96) P. D. Gader, M. Mohamed, and J. M. Keller, "Dynamic Programming Based Handwritten Word Recognition using the Choquet Fuzzy Integral as the Match Function," *Journal of Electronic Imaging*, Special Issue on Digital Document Imaging, Vol. 5, No. 1, pp. 15-25, Jan 1996.

(J97) P. D. Gader, J. Miramonti, Y. Won, and P. Coffield, "Segmentation Free Shared Weight Networks for Automatic Vehicle Detection," *Neural Networks*, Vol. 8, No. 9, pp. 1457-1475, 1995.

(J98) P. D. Gader, M. Mohamed, and J. Chiang, "Comparison of Crisp and Fuzzy Character Neural Networks in Handwritten Word Recognition," *IEEE Trans. Fuzzy Systems.*, Vol. 3, No. 3, pp. 357-364, August 1995.

(J99) P. D. Gader, J. M. Keller, and J. Cai, "A Fuzzy Logic System for Detection and Recognition of Street Number Fields on Handwritten Postal Addresses," *IEEE Trans Fuzzy Systems*, Vol. 3, No. 1, pp. 83-95, Feb 1995.

(J100) P. D. Gader, M. P. Whalen, M. J. Ganzberger, and Dan Hepp, "Handprinted Word Recognition on a NIST Data Set," *Machine Vision and Its Applications*, Vol. 8, pp. 31-40, Jan. 1995.

(J101) J. M. Keller, P. D. Gader, Hossein Tahani, Jung-Hsien Chiang, and Magdi Mohamed, "Advances in Fuzzy Integration for Pattern Recognition," *Fuzzy Sets and Systems*, Vol. 65, pp. 273-283, 1994.

(J102) S. Takriti and P. D. Gader, "Local Decompositions of Gray-Scale Morphological Templates," *Journal of Mathematical Imaging and Vision*, Vol. 2, No. 1, pp. 39-50, 1992.

(J103) P. D. Gader, B. Forester, M. Ganzberger, A. Gillies, B. Mitchell, M. Whalen, and T. Yocum, "Recognition of Handwritten Digits Using Template and Model Matching," *Journal of Pattern Recognition*, Vol. 24, No. 5, pp. 421-431, 1991.

(J104) P. D. Gader, "Separable Decompositions and Approximations of Greyscale Morphological Templates," *Computer Vision, Graphics, and Image Processing-Image Understanding*, Vol. 53, No. 3, pp. 288-296, May 1991.

(J105) G. Ammar and P. D. Gader, "A Variant of the Gohberg-Semencul Formula Involving Circulant Matrices," *SIAM Journal on Matrix Analysis and Applications*, Vol. 12, No. 3, pp. 534-540, July 1991.

(J106) P. D. Gader, "Displacement Operator Based Decompositions of Matrices Using Circulants or Other Group Matrices," *Journal of Linear Algebra and Its Applications*, Vol. 139, October 1990.

(J107) P. D. Gader, "Bidiagonal Factorizations of Fourier Matrices and Systolic Algorithms for Computing Discrete Fourier Transforms," *IEEE Transactions on Acoustics, Speech and Signal Processing*, Vol. 37, No. 8, August 1989.

(J108) P. D. Gader, "Necessary and Sufficient Conditions for the Existence of Local Matrix Decompositions," *SIAM Journal on Matrix Analysis and Applications*, Vol. 9, No. 3, pp. 305-313, July 1989.

(J109) P. D. Gader, "Tridiagonal Factorizations of Fourier Matrices and Applications to Parallel Computations of Discrete Fourier Transforms," *Journal of Linear Algebra and its Applications*, Vol. 102, pp. 1280-1283, April 1988.

(J110) G. X. Ritter and P. D. Gader, "Image Algebra Techniques for Parallel Image Processing," *Journal of Parallel and Distributed Computing: Special Issue on Parallel Image Processing and Pattern Recognition* (invited paper), Vol. 4, No. 5, pp. 7-44, March 1987.

JOURNAL COMMENTS

P.D. Gader, A. Zare, J. Bolton, J. Chanussot, "WHISPERS 2013: 5th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing [Conference Reports], "*IEEE Geoscience & Remote Sensing Magazine*, vol. 1, no.4, pp. 50-53, December 2013.

P. D. Gader, "Guest Editor Foreword to the Special Issue on Recognition Technology", *IEEE Transactions on Fuzzy Systems*, Vol. 9, No. 1, pp. 1-2, Feb 2001.

A. K. Hocaoglu and **P. D. Gader**, "Comments on Choquet Fuzzy Integral-Based Hierarchical Networks for Decision Analysis," *IEEE Trans Fuzzy Systems*, Vol. 7, No. 6, pp.767-768, December 1999.

BOOK CHAPTERS

G. X. Ritter, **P. D. Gader**, "Fixed Points of Lattice Transforms and Lattice Associative Memories", chapter in *Advances in Imaging and Electron Physics*, P. Hawkes (ed.): Elsevier Press, pp.165-242, 2006.

P. D. Gader, "Signal-Processing and Sensor Fusion Methods", chapter in Alternatives for Landmine Detection, J. MacDonald, J. R. Lockwood (eds.): RAND Science and Technology Policy Institute, pp. 311-326, 2003.

P. D. Gader, Bruce N. Nelson, A. Koksal Hocaoglu, Sansanee Auephanwiriyakul, Mohamed A. Khabou, "Neural versus Heuristic Development of Choquet Fuzzy Integral Fusion Algorithms for Land Mine Detection," chapter in *Neuro-fuzzy Pattern Recognition* H. Bunke, A. Kandel (eds.): World Scientific Publ. Co., pp 205-226, 2000.

J. M. Keller, **P. D. Gader**, and A. K. Hocaoglu, "Fuzzy Integrals in Image Processing and Recognition," chapter in *Fuzzy Measures and Integrals*, edited by M. Grabisch, T. Murofushi, and M. Sugeno. Berlin: Springer-Verlag, pp. 435-466, 2000.

P. D. Gader, "Lexicon-Driven Handwritten Word Recognition," chapter in *Electronic Imaging Technology*, edited by Edward Dougherty. Bellingham, WA: SPIE Optical Engineering Press, pp. 317-341, 1999.

P. D. Gader, J. M. Keller, and J. Cai, "Handwritten Numeric Field Location via Fuzzy Logic,"chapter in *Fuzzy Set Methods in Engineering: A Guided Tour of Applications*, edited by R. Yager, D. Dubois, and H. Prade. New York: John Wiley & Sons, 1996

J. Keller, R. Krishnapuram, **P. D. Gader**, and Y-S. Choi, "Fuzzy Rule-Based Models in Computer Vision," chapter in *Fuzzy Modeling: Paradigms and Practice*, edited by W. Pedrycz. Norwell, MA: Kluwer Academic Publishers, pp. 353-375, 1996.

P. D. Gader, Andres M. Gillies, and D. Hepp, "Handwritten Character Recognition," chapter in *Digital Image Processing Methods*, edited by Edward Dougherty. New York: Marcel Dekker, pp. 223-261, 1994.

G. Ammar and **P. D. Gader**, "New Decompositions of the Inverse of a Toeplitz Matrix," chapter in *Signal Processing, Scattering and Operator Theory, and Numerical Methods*, edited by M. A. Kaashoek, J. H. van Schuppen, and A. C. M. Ran. Boston: Birkhauser, 1990.

CONFERENCE PAPERS (223 accepted/published)

(C1) M. Cook, A. Zare, & P. Gader, "Outlier Detection through Null Space Analysis of Neural Networks", International Conference on Machine Learning (ICML) 2020 workshop on Uncertainty and Robustness in Deep Learning (accepted), July 2020.

(C2) Meerdink, S., Bocinsky, J., Wetherley, E., Zare, A., Mccurley, C., & Gader, P. (2019). "Developing spectral libraries using multiple target multiple instance adapative cosine/coherence estimator", *10th Workshop Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing* (WHISPERS), Sept. 2019, https://doi.org/10.1109/WHISPERS.2019.8920989

(C3) Fick, R., Gader, P., Zare, A., & Meerdink, S.(2019). "Temporal mapping of hyperspectral data", *10th Workshop Hyperspectral Imaging & Signal Processing: Evolution in Remote Sensing* (WHISPERS), Sept. 2019, https://doi.org/10.1109/WHISPERS.2019.8921373

(C4) Yuan Zhou, Anand Rangarajan, Paul D. Gader, "Nonrigid registration of hyperspectral and color images with vastly different spatial and spectral resolutions for spectral unmixing and pansharpening", Proc. Computer Vision and Pattern Recognition (CVPR) Workshop on EarthVision: Large Scale Computer Vision for Remote Sensing Imagery, Honolulu, HI, July 2017.

(C5) L. Kalantari and P. D. Gader, "Cross-validating Gaussian process methods for hyperspectral data from tree crowns", IEEE Symposium Geoscience and Remote Sensing (IGARSS 17), July 2017, Forth Worth TX, pp..

(C6) Ron Fick and P. D. Gader, "Dimensionality estimation for manifold-based classification of airborne spectral data acquired over terrestrial regions", Proc SPIE Conf. Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXIII, Anaheim, CA, (2017).

(C7) Yuan Zhou, Anand Rangarajan and P. D. Gader, "A Gaussian Mixture Model Representation Of Endmember Variability For Spectral Unmixing", Proc. 8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS), Los Angeles, CA, August 2016.

(C8) Rob Heylen, Paul Scheunders, Alina Zare, P. D. Gader, "Alternating Angle Minimization Based Unmixing With Endmember Variability", IEEE Symposium Geoscience and Remote Sensing (IGARSS 17), July 2017. pp. 6974-6977, Beijing, China , July 2016.

(C9) P. D. Gader, L. Kalantari, and Hichem Frigui, "Gaussian processes and self-organizing maps for possibilistic, robust, ambiguity preserving (PRAM) classification and regression with spectral data", Proc. SPIE Conf. Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXII, Baltimore, MD, April 2016.

(C10) Zhou, Yuan, Anand Rangarajan, and P. D. Gader. "A spatial compositional model (SCM) for linear unmixing and endmember uncertainty estimation." Proc. 7th IEEE Workshop on Hyperspectral Image and SIgnal Processing: Evolution in Remote Sensing (WHISPERS 2015), 2 June 2015 - 5 June 2015 (Tokyo, Japan).

(C11) Ce Yang, Won S. Lee, P. D. Gader, "Blueberry Maturity Stage Detection Based on Spectral-Spatial detection of Hyperspectral Image Using Selection Bands", Proceedings International Workshop on Robotics in Agriculture, May 2015.

(C12) P. Massoudifar, A. Rangarajan, and P. D. Gader. "Superpixel Estimation for Hyperspectral Imagery.", 2014 IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW). 2014.

(C13) L. Kalantari, P. D. Gader, S. Graves, S. Bohlman, "Evaluating similarity measures for hyperspectral classification of tree species at Ordway-Swisher Biological Station." *Geoscience and Remote Sensing Symposium (IGARSS), 2014 IEEE International.* IEEE, 2014.

(C14) P. Massoudifar, A. Rangarajan, A. Zare, P. D. Gader, "An integrated graph cuts segmentation and piecewise convex unmixing approach for hyperspectral imaging." *IEEE GRSS Workshop Hyperspectral Image Signal Processing: Evolution Remote Sensing*. 2014.

(C15) H. Jenzri, H. Frigui, and P. D. Gader. "Context dependent hyperspectral subpixel target detection." Image Processing (ICIP), 2014 IEEE International Conference on Image Processing IEEE, 2014.

(C16) Dranishnikov, Dmitri; Gader, Paul; Zare, Alina; Glenn, Taylor, "Unmixing using a combined microscopic and macroscopic mixture model with distinct endmembers," Proceedings of the 21st European Signal Processing Conference (EUSIPCO), pp.1,5, 9-13 Sept. 2013.

(C17) Glenn, T.; Dranishnikov, D.; Gader, P.; Zare, A, "Subpixel target detection in hyperspectral imagery using piece-wise convex spatial-spectral unmixing, possibilistic and fuzzy clustering, and co-registered LiDAR," IEEE International Geoscience and Remote Sensing Symposium (IGARSS, pp.1063,1066, 21-26 July 2013

(C18) J. Dula; A. Zare; Dominic Ho; P. D. Gader, "Landmine classification using possibilistic K-nearest neighbors with wideband electromagnetic induction data", Proc. SPIE 8709, Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XVIII, 87091F (7 June 2013);

(C19) H. Jenzri, H. Frigui, P. D. Gader, "Context dependent spectral unmixing", 2012 IEEE International Workshop Machine Learning for Signal Processing, Sept. 23-26, 2012, Santander, Spain.

(C20) S. E. Yuksel, J. Bolton, P. D. Gader, "Landmine detection with multiple instance hidden Markov models, 2012 IEEE International Workshop Machine Learning for Signal Processing, Sept. 23-26, 2012, Santander, Spain

(C21) Alina Zare, Ouiem Bchir, Hichem Frigui, Paul D. Gader, "Hyperspectral image analysis with piece-wise convex endmember estimation and spectral unmixing", IEEE Conf. on Image Processing (ICIP), Sept. 30 – Oct. 3, 2012.

(C22) Ryan Close, P. D. Gader, "Estimating the Percentage of Linear and Nonlinear Mixing at the Subpixel Level in Hyperspectral Imaging", *IEEE Geoscience and Remote Sensing Symposium (IGARSS)*, July 23-27, 2012.

(C23) Seniha E. Yuksel, P. D. Gader, "Mixture of HMM experts with applications to landmine detection", *IEEE Geoscience and Remote Sensing Symposium (IGARSS*), July 23-27, 2012, pp. 6852 - 6855.

(C24) P. D. Gader, D. Dranishnikov, Alina Zare, and J. Chanussot, "A Sparsity Promoting Bilinear Unmixing Model", IEEE Workshop on Hyperspectral Image and Signal Processing – Evolution in Remote Sensing, Shanghai, China, June 2012.

(C25) Alina Zare, P. D. Gader, T. Allgire, D. Dranishnikov, R. Close, "Bootstrapping for piece-wise convex endmember distribution detection", IEEE Workshop on Hyperspectral Image and Signal Processing – Evolution in Remote Sensing, Shanghai, China, June 2012.

(C26) Seniha E. Yuksel, Thierry A. Dubroca, Rolf E. Hummel, P. D. Gader, "An automatic detection software for differential reflection spectroscopy", *SPIE Conf. Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVIII*, April 2012, .

(C27) Ryan Close, P. D. Gader, Joseph Wilson, "Using physics-based macroscopic and microscopic mixture models for hyperspectral pixel unmixing ",*SPIE Conf. Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVIII*, April 2012.

(C28) K. C. Ho and P. D. Gader, "On the estimation of target depth using the single-transmit multiple-receive metal detector array", *SPIE Conf Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XVII, April 2012*,

(C29) Sean Goldberg, Taylor Glenn, Joseph N. Wilson, P. D. Gader, "Landmine detection using two-tapped joint orthogonal matching pursuits", *SPIE Conf Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XVII, April 2012.*

(C30) J. Bolton, P. D. Gader, "Conjunctive formulation of the random set framework for multiple instance learning: Application to remote sensing," *Geoscience and Remote Sensing Symposium (IGARSS)*, pp.3582-3585, 24-29 July 2011.

(C31) R. Close, J. Wilson, P. D. Gader, "A Bayesian approach to localized multi-kernel learning using the relevance vector machine," *Geoscience and Remote Sensing Symposium (IGARSS)*, pp.1103-1106, 24-29 July 2011.

(C32) Alina Zare, P. D. Gader, "Piece-wise convex spatial-spectral unmixing of hyperspectral imagery using possibilistic and fuzzy clustering," *IEEE International Conf. on Fuzzy Systems (FUZZ-IEEE)*, pp.741-746, 27-30 June 2011.

(C33) Alina Zare, P. D. Gader, J. Bolton, S. Yuksel, T. Dubroca, R. Close, R. Hummel, "Sub-pixel target spectra estimation and detection using functions of multiple instances," *3rd Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS)*, pp.1-4, 6-9 June 2011.

(C34) S. E. Yuksel and P. D. Gader, "Variational Mixture of Experts For Classification with Applications to Landmine Detection", *Proceedings of 20th International Conference on Pattern Recognition*, (ICPR 2010), Istanbul, Turkey, Aug. 23-26 2010, 2981-2984

(C35) O. Missaoui, H. Frigui, P. D. Gader, "Model level fusion of edge histogram descriptors and gabor wavelets for landmine detection with ground penetrating radar," IEEE *Geoscience and Remote Sensing Symposium (IGARSS)*, pp.3378-3381, 25-30 July 2010.

(C36) J. Bolton, P. D. Gader, "Multiple instance learning for hyperspectral image analysis," IEEE Geoscience and Remote Sensing Symposium (IGARSS), pp.4232-4235, 25-30 July 2010.

(C37) Alina Zare, P. D. Gader, "Robust Endmember detection using L1 norm factorization," IEEE Geoscience and Remote Sensing Symposium (IGARSS), pp.971-974, 25-30 July 2010.

(C38) Ahmed Chamseddine, A. Abdallah, H. Frigui and P. D. Gader, "Local Fusion with Fuzzy Integrals", *Proceedings of IEEE Conference on Fuzzy Systems* (FUZZ-IEEE '10), Barcelona, Spain, July 18-23 2010, CD.

(C39) G. Heo and P. D. Gader, "An Extension of Global Fuzzy C-means Using Kernel Methods", *Proceedings of IEEE Conference on Fuzzy Systems* (FUZZ-IEEE '10), Barcelona, Spain, July 18-23 2010, CD.

(C40) G. Heo, P. D. Gader, and H. Frigui, "A Noise Robust Variant of Context Extraction for Local Fusion", *Proceedings of IEEE Conference on Fuzzy Systems* (FUZZ-IEEE '10), Barcelona, Spain, July 18-23 2010, CD.

(C41) Alina Zare and P. D. Gader, "An Investigation of Likelihoods and Priors for Bayesian Endmember Estimation", 30th Int'l Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering, Chamonix, France, July 4-9, 2010 (Invited Paper)

(C42) Alina Zare, O. Bchir, H. Frigui, and P. D. Gader, "Spatially Smooth Piece-wise Convex Endmember Detection,, Proceedings of *IEEE Workshop on Hyperspectral Image and Signal Processing* (WHISPERS'10), Reykjavik, Iceland, June 2010, CD.

(C43) J. Bolton and P. D. Gader, "Spatial Multiple Instance Learning for Hyperspectral Image Analysis", Proceedings of *IEEE Workshop on Hyperspectral Image and Signal Processing* (WHISPERS'10), Reykjavik, Iceland, June 2010, CD.

(C44) O. Bchir, H. Frigui, Alina Zare, and P. D. Gader, "Multiple Model Endmember Detection Based On Spectral And Spatial Information", Proceedings of *IEEE Workshop on Hyperspectral Image and Signal Processing* (WHISPERS'10), Reykjavik, Iceland, June 2010, CD.

(C45) Alina Zare, O. Bchir, H. Frigui, and P. D. Gader, "A Comparison Of Deterministic And Probabilistic Approaches To Endmember Representation", Proceedings of *IEEE Workshop on Hyperspectral Image and Signal Processing* (WHISPERS'10), Reykjavik, Iceland, June 2010, CD (Invited Paper).

(C46) Alina Zare, M. Silvious, R. Close, Paul D. Gader, "Quantifying the benefit of airborne and ground sensor fusion for target detection, Alina Zare, Univ. of Florida (USA); Miranda Silvious,

(C47) Jeremy Bolton, Paul D. Gader, Hichem Frigui, "Multiple instance learning for landmine detection in ground penetrating radar data", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIV*, April 2010, CDROM.

(C48) Dominic K. Ho, Paul D. Gader, Hichem Frigui, "Effect of radar undesirable characteristics on the performance of spectral feature landmine detection technique", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIV*, April 2010, CDROM.

(C49) Anis Hamdi, Oualid Missaoui, Hichem Frigui, Paul D. Gader, "Landmine detection using ensemble discrete hidden Markov models with context dependent training methods", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIV*, April 2010, CDROM.

(C50) Andrew Fadeev, Aledsey Fadeev, Hichem Frigui, Paul D. Gader, "Comparison of different classifi cation algorithms for landmine detection using GPR", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIV*, April 2010, CDROM.

(C51) Alina Zare and Paul D. Gader, "L1-endmembers: a robust endmember detection and spectral unmixing algorithm", *Proceedings of the SPIE Conference Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XVI*, April 2010, CDROM.

(C52) O. Missaoui, H. Frigui, P. D. Gader, "Discriminative Multi-stream Discrete Hidden Markov Models," Proceedings of *IEEE Conference on Machine Learning and Applications* (ICMLA), Miami Beach, Dec. 2009, pp. 178-183.

(C53) L. Zhang, H. Frigui, P. D. Gader, "Context-Dependent Fusion of Multiple Algorithms with Minimum Classification Error Learning" Proceedings of *IEEE Conference on Machine Learning and Applications* (ICMLA), Miami Beach, Dec. 2009, pp. 190-195.

(C54) Alina Zare and P. D. Gader, "Context-dependent fusion for mine detection using airborne hyperspectral imagery", Proceedings of *IEEE Workshop on Hyperspectral Image and Signal Processing* (WHISPERS'09), Grenoble, France, Aug. 2009 CDROM.

(C55) L. Zhang, H. Frigui, P. D. Gader and J. Bolton, "Context-dependent fusion for mine detection using airborne hyperspectral imagery" Proceedings of *IEEE Workshop on Hyperspectral Image and Signal Processing* (WHISPERS'09), Grenoble, France, Aug. 2009 CDROM.

(C56) J. Bolton and P D. Gader, "A Random Measure Approach for Context Estimation in Hyperspectral Imagery" Proceedings of *IEEE Workshop on Hyperspectral Image and Signal Processing*, Grenoble, France, Aug. 2009 CDROM.

(C57) G. Heo and P D. Gader, "Fuzzy SVM for Noisy Data: A Robust Membership Calculation Method", Proceedings *IEEE Conf. on Fuzzy Systems*, Jeju Island, Korea, Aug. 2009, pp. 431-436.

(C58) Abdallah, H. Frigui, P. D. Gader, "Context extraction for local fusion using fuzzy clustering and feature discrimination,", Proceedings *IEEE Conf. on Fuzzy Systems*, Jeju Island, Korea, Aug. 2009, pp. 490-495.

(C59) G. Heo, P D. Gader, H. Frigui, "Robust Kernel PCA using Fuzzy Membership", International Joint Conference on Neural Networks(IJCNN), Atlanta GA, Jun. 2009 pp. 1213-1220.

(C60) G. Heo, P D. Gader, "Learning the Number of Gaussian Components Using Hypothesis Test", *International Joint Conference on Neural Networks(IJCNN)*, Atlanta GA, Jun. 2009, pp. 1206 -1212.

(C61) H. Frigui, A. S. Fadeev, A. Karem, P. D. Gader, "Adaptive edge histogram descriptor for landmine detection using GPR", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIII*, April 2009, CDROM.

(C62) H. Frigui, A. Hamdi, O. Missaoui, P. D. Gader, "Landmine detection using mixture of discrete hidden Markov models", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIII*, April 2009, CDROM.

(C63) D. K. C. Ho, P. D. Gader, H. Frigui, "On improving subspace spectral feature technique for the detection of weak scattering plastic antitank landmines," *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIII*, April 2009, CDROM.

(C64) H. Frigui, A. Chamseddine, P. D. Gader, "Context-dependent fusion for landmine detection with multisensor systems", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIII*, April 2009, CDROM.

(C65) J. N. Wilson, G. Ramachandran, P. D. Gader, B. Smock, W. R. Scott, "Wideband EMI pre-screening for landmine detection", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XIII*, April 2009, CDROM.

(C66) G. Heo, P D. Gader, "Prior-Updating Ensemble Learning for Discrete HMM", *Proceedings of the International Conference on Pattern Recognition (ICPR)*, Tampa FL, Dec. 2008

(C67) Alina Zare, P D. Gader, "Endmember Detection using the Dirichlet Process", *Proceedings of the International Conference on Pattern Recognition (ICPR)*, Tampa FL, Dec. 2008

(C68) R. Mazhar and P. D. Gader, "EK-SVD: Optimized Dictionary Design for Sparse Representations", *Proceedings of the International Conference on Pattern Recognition (ICPR)*, Tampa FL, Dec. 2008.

(C69) P. D. Gader, J. N. Wilson, D. Ho, S. Yuksel, G. Ramachandran, G. Heo, "Hierarchical methods for landmine detection with wideband electro-magnetic induction and ground penetrating radar multi-sensor systems", *Proceedings of the IEEE Geoscience and Remote Sensing Symposium*, July 2008.

(C70) J. Bolton, P. D. Gader, "The Benefits of Context Estimation for Target Spectra Detection in Hyperspectral Imagery", *Proceedings of the IEEE Geoscience and Remote Sensing Symposium*, July 2008.

(C71) H. Frigui, L. Zhang, P. D. Gader, "Context-dependent Multi-Sensor Fusion for Landmine Detection", *Proceedings of the IEEE Geoscience and Remote Sensing Symposium*, July 2008.

(C72) R. Mazhar, P. D. Gader, J. Wilson, "A Matching Pursuit Based Similarity Measure for Fuzzy Clustering and Classification of Signals", *Proceedings of the IEEE World Congress on Computational Intelligence*, Hong Kong, China, 1-6 June 2008 Page(s):1950 – 1955.

(C73) J. Bolton, P. D. Gader, "Random Set Model for Context-based Classification", *Proceedings of the IEEE World Congress on Computational Intelligence*, Hong Kong, China, 1-6 June 2008 Page(s):1999-2006.

(C74) Andres Mendez-Vazquez, P. D. Gader, "Maximum a Posteriori EM MCE Logistic Lasso for Learning Fuzzy Measures", *Proceedings of the IEEE World Congress on Computational Intelligence*, Hong Kong, China, 1-6 June 2008 Page(s):2007-2013.

(C75) K. C. Ho, J. N. Wilson, P. D. Gader, "On the use of aggregation operators for humanitarian demining using hand-held GPR", *Proceedings of the IEEE World Congress on Computational Intelligence*, Hong Kong, China, 1-6 June 2008 Page(s):2103-2108.

(C76) Andres Mendez-Vazquez, P. D. Gader, "Learning Fuzzy Measure Parameters by Logistic LASSO", Proceedings of the North American Fuzzy Information Processing Society Meeting, NAFIPS 2008, New York, NY, 19-22 May 2008 Page(s):1 – 7.

(C77) K. Stone, J. M. Keller, M. Busch, K. C. Ho, P. D. Gader, "On the registration of FLGPR and IR data for the forward-looking landmine detection system and its use in eliminating FLGPR false alarms", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XII*, April 2008, (CDROM).

(C78) J. Bolton, P. D. Gader, "Application of context-based classifier to remotely sensed imagery for mine detection", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XII*, April 2008,(CDROM).

(C79) H. Frigui, O. Missaoui, P. D. Gader, "Landmine detection with ground penetrating radar using discrete hidden Markov models with symbol dependent features", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XII*, April 2008, (CDROM).

(C80) K. C. Ho, P. D. Gader, J. N. Wilson, H. Frigui, "Subspace processing of GPR signals for vehicle-based landmine detection system", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XII*, April 2008, (CDROM).

(C81) H. Frigui, P. D. Gader, A. Chamseddine, "A generic framework for context-dependent fusion with application to landmine detection", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XII*, April 2008, (CDROM).
(C82) Alina Zare, P. D. Gader, "Sparsity Promoting Iterated Constrained Endmember Detection with Integrated Band Selection," *Proceedings of the IEEE Geoscience and Remote Sensing Symposium 2007*, Barcelona, Spain, Barcelona, Spain, 23-28 July 2007, Page(s): 4045-4048.

(C83) R. Mazhar, J. N. Wilson, P. D. Gader "Use of an application-specific dictionary for matching pursuits discrimination of landmines and clutter", *Proceedings of the IEEE Geoscience and Remote Sensing Symposium 2007*, Barcelona, Spain, 23-28 July 2007, Page(s): 26-29.

(C84) J. Bolton and P. D.Gader, "Application of Random Set Based Clustering to Landmine Detection with Hyperspectral Imagery", *Proceedings of the IEEE Geoscience and Remote Sensing Symposium 2007*, Barcelona, Spain, Barcelona, Spain, 23-28 July 2007, Page(s): 2022-2025.

(C85) K. Ho, P. D. Gader, H. Frigui, J. Wilson, "Confidence level fusion of edge histogram descriptor, hidden Markov model, spectral correlation feature, and NUKEv6", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XI*, Vol. 6553, May 2007, CID: 655368.

(C86) H. Frigui, L. Zhang, P. D. Gader, D. Ho, "Context dependent fusion for landmine detection with ground penetrating radar", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XI*, Vol. 6553, May 2007, CID: 655369.

(C87) J. Wilson, P. D. Gader, "Use of the Borda count for landmine discriminator fusion", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XI*, Vol. 6553, May 2007, CID: 655370.

(C88) X. Zhang, P. D. Gader, H. Frigui, "Feature learning for a hidden Markov model approach to landmine detection", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XI*, Vol. 6553, May 2007, CID: 655374.

(C89) H. Frigui, O. Missaoui, P. D. Gader, "Landmine detection using discrete hidden Markov models with Gabor features", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XI*, Vol. 6553, May 2007, CID: 655377.

(C90) P. Ngan, S. Burke, R. Cresci, J. Wilson, P. D. Gader, K. Ho, E. Bartosz, H. Duvoisin, "Development of region processing algorithm for HSTAMIDS: status and field test results", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XI*, Vol. 6553, May 2007, CID: 655380.

(C91) Alina Zare, P. D. Gader, "SPICE: a sparsity promoting iterated constrained endmember extraction algorithm with applications to landmine detection from hyperspectral imagery," *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets XI*, Vol. 6553, May 2007, CID: 655319.

(C92) Andres Mendez-Vazquez and P. D. Gader, "Sparsity Promotion Models for the Choquet Integral", Proceedings of the 2007 Symposium on Foundations of Computational Intelligence, Honolulu, HI, April 2007, pp. 454-459.

(C93) H. Frigui and P. D. Gader, "Detection and Discrimination of Land mines based on Edge Histogram Descriptors and Fuzzy K-Nearest Neighbors", *Proceedings of the IEEE International Conference on Fuzzy Systems*, Vancouver, BC, Canada, July 2006.

(C94) M. Schatten, P. D. Gader, J. Bolton, Alina Zare, Andres Mendez-Vazquez, "Sensor fusion for airborne landmine detection", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2006.

(C95) K. C. Ho, P. D. Gader, J. N. Wilson, "Improving spectral features from GPR by exploring depth information", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2006.

(C96) T. Wang, J. M. Keller, M. Busch, P. D. Gader, C. Hawkins, J. McElroy, K. C. Ho, "On the confidence level fusion of IR and forward-looking GPR", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2006.

(C97) J. N. Wilson, K. C. Ho, P. D. Gader, "An analysis of sweep patterns for a handheld demining system", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2006.

(C98) M. Busch, J. M. Keller, P. D. Gader, "A scale-space approach to detect a class of side-attack landmines from SWIR video sequences", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2006.

(C99) H. Frigui, P. D. Gader, "Detection and discrimination of landmines in ground-penetrating radar based on edge histogram descriptors", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2006.

(C100) K. C. Ho, P. D. Gader, J. N. Wilson, T. Glenn, "On the use of energy density spectra for discriminating between landmines and clutter objects", Proceedings of the IEEE Antennas and Propagation Society International Symposium, Vol. 3B, Washington, D. C., July 2005, pp. 84-87.

(C101) P. D. Gader, J. McElroy, C. Hawkins, "Side attack mine detection using near infrared imagery", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2005, pp. 68-80.

(C102) T. Wang, O. Sjahpetura, J. Keller, P. D. Gader, "Landmine detection using forward-looking GPR with object-tracking", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2005, pp. 1080-1089.

(C103) J. N. Wilson, P. D. Gader, H. Suh, "Compactometry, the density distribution, and their use in discriminating landmines and clutter", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2005, pp. 1132-1141.

(C104) D. K. Ho, P. D. Gader, J. N. Wilson, X. Zhang, T. Glenn, S. Huenefeldt, "Landmine detection using frequency domain features from GPR measurements and their fusion with time domain features", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2005, pp. 1141-1151.

(C105) T. Wang, O. Sjahputera, J. Keller, P. D. Gader, "Feature analysis for forward-looking landmine detection using GPR", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets X*, Orlando, FL, April 2005, 1233-1245.

(C106) W. S. Lee, P. D. Gader, J. N. Wilson, R. Weaver, S. Bishop, P. Gugino, and P. Howard, "Ground-tracking for on and off-road detection of landmines with Ground Penetrating Radar", *Proceedings 24th Army Science Conference*, Orlando, FL, November 2004, CDROM.

(C107) P. D. Gader, Andres Mendez-Vasquez, K. Chamberlin, J. Bolton, and Alina Zare, "Multi-Sensor and Algorithm fusion with the Choquet Integral: Applications to Landmine Detection", *Proceedings IEEE Conference Geo-science and Remote Sensing*, Anchorage, AK, September 2004, CDROM, pp. 1605-1608.

(C108) K. C. Ho, P. D. Gader, J. N. Wilson, "Improving Landmine Detection Using Frequency Domain Features from Ground Penetrating Radar", *Proceedings IEEE Conference Geo-science and Remote Sensing*, Anchorage, AK, September 2004, CDROM.

(C109) P. D. Gader, Wen-Hsiung Lee, and Andres Mendez-Vasquez, "Continuous Choquet Integrals with respect to random sets with applications to landmine detection", *Proceedings IEEE Conference Fuzzy Systems*, Budapest, Hungary, July 2004, CDROM.

(C110) P. D. Gader, Wen-Hsiung Lee and Xuping Zhang, "Renyi entropy with respect to Choquet capacities", *Proceedings IEEE Conference Fuzzy Systems*, Budapest, Hungary, July 2004, CDROM.

(C111) H. Frigui, P. D. Gader, K. Satyanarayana, "Landmine Detection with Ground Penetrating Radar using Fuzzy K-Nearest Neighbors", *Proceedings IEEE Conference Fuzzy Systems*, Budapest, Hungary, July 2004, CDROM.

(C112) H. Frigui, P. D. Gader, Wen-Hsiung Lee, Joseph N. Wilson, "Detection and Discrimination of Landmines in Ground Penetrating using an Eigenmine and Fuzzy Membership Function Approach", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IX*, Orlando, FL, April 2004.

(C113) P. D. Gader, R. Grandhi, W-H. Lee, J. Wilson, K. C. Ho, "Feature Analysis for the NIITEK Ground Penetrating Radar using Order Weighted Averaging Operators for Landmine Detection", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IX*, Orlando, FL, April 2004.

(C114) J. Wilson, P. D. Gader,, K. C. Ho, W-H. Lee, R. J. Stanley, "Region Processing of Ground Penetrating Radar for Handheld Landmine Detection", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IX*, Orlando, FL, April 2004.

(C115) John McElroy, P. D. Gader, James M. Keller, and Robert Luke, "Side Attack Mine Detection in Visible and Near IR imagery via Morphological Image Analysis", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IX*, Orlando, FL, April 2004.

(C116) Joe Stanley, K. C. Ho, P. D. Gader, J. Wilson, "Advances in EMI and GPR Algorithms in Discrimination Mode Processing for Handheld Landmine Detectors", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IX*, Orlando, FL, April 2004.

(C117) Tsaipei Wang, James M. Keller, P. D. Gader, A. Koksal Hocaoglu, Gerhard X. Ritter, "Phase signatures in acoustic-seismic landmine detection", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IX, Orlando, FL, April 2004.

(C118) Robert Luke, James M. Keller, P. D. Gader, Marjorie Skubic, and Tsaipei Wang, "Experiments in Tripwire Detection using visible and Near IR imagery", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IX*, Orlando, FL, April 2004.

(C119) C. S. Throckmorton, L. Collins, P. A. Torrione, P. D. Gader, W. Lee, J. N. Wilson, "The efficacy of human observation for discrimination and feature identification of targets measured by the NIITEK ground-

penetrating radar", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IX, Orlando, FL, April 2004.

(C120) P. D. Gader, J. N. Wilson, and W-H. Lee, "Adaptive Whitening for Landmine Detection with Array-Based Ground Penetrating Radar", *Proceedings of the Int'l Conference on Requirements and Technologies for the Detection, Removal, and Neutralization of Landmines and UXO (EUDEM 2003)*, Sept. 15-18, 2003, pp. 509-515.

(C121) Ali Koksal Hocaoglu, P. D. Gader, G.X. Ritter, "Acoustic/Seismic Imaging using Spectral Estimation for Landmine Detection", *Proceedings of the Int'l Conference on Requirements and Technologies for the Detection, Removal, and Neutralization of Landmines and UXO (EUDEM 2003)*, Sept. 15-18, 2003, pp. 489-495.

(C122) G. X. Ritter, J. M., Keller, P. D. Gader, T. Wang, and Ali K. Hocaoglu, "Autonomous Detection of Landmines using Seismic/Acoustic Magnitude and Phase Based Information", *Proceedings of the Int'l Conference on Requirements and Technologies for the Detection, Removal, and Neutralization of Landmines and UXO (EUDEM 2003)*, Sept. 15-18, 2003, pp. 496-499.

(C123) M. Popescu, J. M. Keller, and P. D. Gader, "Linguistic hidden Markov models", *Proceedings IEEE Conference Fuzzy Systems*, May 25-28, 2003, pp. 796-797.

(C124) Ali K. Hocaoglu and P. D. Gader, "An interpretation of discrete Choquet integrals in morphological image processing", *Proceedings IEEE Conference Fuzzy Systems*, May 25-28, 2003, pp. 1291-1295.

(C125) P. D. Gader, "Continuous Choquet integrals with respect to random sets", Proceedings IEEE Conference Fuzzy Systems, May 25-28, 2003, pp. 1281-1284.

(C126) H. Frigui, K. Satyanarayana, and P. D. Gader, "Detection of Land Mines using Fuzzy and Possibilistic Membership Functions", *Proceedings IEEE Conference Fuzzy Systems*, May 25-28, 2003, pp. 834-839.

(C127) Ali K. Hocaoglu and P. D. Gader, "Detection of Tripwires using Diffusion", *Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VIII*, Orlando, FL, April 2003, pp. 527-535.

(C128) J. M. Keller, P. D. Gader, T. Wang, Ali K. Hocaoglu, G. X. Ritter, M. Schmalz, "Model-based landmine detection algorithms for acoustic/seismic data", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VIII, Orlando, FL, April 2003, pp. 558-568.

(C129) J. M. Keller, M. Skubic, P. D. Gader, T. Wang, R. Luke, "Real-time tripwire detection on a robotic testbed", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VIII, Orlando, FL, April 2003, pp. 1287-1297.

(C130) P.D. Gader, Joseph N. Wilson, T. Wang, J.M. Keller, Wen-Hsiung Lee, R. Grandhi, A. Koksal Hocaoglu, John McElroy[,] "Fusion of acoustic/seismic and GPR detection algorithms", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VIII, Orlando, FL, April 2003, pp. 1307-1315.

(C131) K. C. Ho and P. D. Gader, "Dynamic Template Matching-Based Processing for Hand-Held Landmine Detector", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VIII, Orlando, FL, April 2003, 1261-1270.

(C132) P. D. Gader and A. K. Hocaoglu, "Continuous Processing of Acoustic Data for Landmine Detection", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VII, Orlando, FL, pp, 654-664, April 2002.

(C133) K. C. Ho, P. D. Gader, and J. B. Devaney, "Locate Mode Processing for Hand-held Landmine Detection using GPR", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VII, Orlando, FL, pp.356-366, April 2002.

(C134) P. D. Gader, M. Popescu, and K. C. Ho, "Generalized Hidden Markov Models for Landmine Detection", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VII, Orlando, FL, pp.349-355, April 2002.

(C135) J. M. Keller, P. D. Gader, Z. Cheng, and A. K. Hocaoglu, "Fourier Descriptor Features for Acoustic Landmine Detection", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VII, Orlando, FL, 673-684, April 2002.

(C136) R.J. Stanley, S. Somanchi and P. D. Gader, "The Impact of Weighted Density Distribution Function Features on Landmine Detection Using Hand-Held Units", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VII, Orlando, FL, 892-902, April 2002.

(C137) Y, Zhao, P. Chen, P.D. Gader, Y. Zhang, "Combined Evolutionary Algorithm and Minimum Classification Error Training for DHMM Based Landmine Detection", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VII, Orlando, FL, 1038-1045, April 2002.

(C138) K. Hocaoglu and P. D. Gader, "Generalizations of Morphological Shared Weight Networks Using Choquet Integrals with Applications to Ground Penetrating Radar Based Land Mine Detection", Proceedings of the Workshop on Computer Vision Beyond the Visible Spectrum, Kauai, HI, CD-ROM, December 2001.

(C139) H. Frigui, P. D. Gader, and R. Krishnapuram, "Handwritten Character Membership Function Estimation for Word Recognition, Proceedings of the IEEE International Conference on Fuzzy Systems, December 2001, pp. 928-931.

(C140) R. J. Stanley, J. M. Keller, C. W. Caldwell, P. D. Gader, "Abnormal cell detection using the Choquet integral", Proceedings of the IFSA/NAFIPS 2001 Conference, pp. 1134-1139, Vancouver, Canada, July 2001.

(C141) J. Keller, P. D. Gader, S. Sohn, and C. Caldwell, "Soft Counting Networks for Bone Marrow Differentials", Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics, Tuscon, AZ, October, 2001, pp. 3425-3428.

(C142) M. Mystkowski and P. D. Gader, "Adaptive Hidden Markov models for extended landmine detection", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VI, Orlando, FL, April 2001, pp. 476-482.

(C143) K. C. Ho and P. D. Gader, "An Improved Correlation Based Detector for a Hand-held Landmine Detector", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VI, Orlando, FL, April 2001, pp. 483-493.

(C144) K. C. Ho, P. D. Gader, S. Bishop, D. Lang, and B. Duston, "Fusion of Energy Based Processing and HMM GPR Algorithms for the Mine Hunter/Killer Program", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VI, Orlando, FL, April 2001, pp.806-816.

(C145) J. M. Keller, S. Auephanwiriyakul, and P. D. Gader, "Experiments in Predictive Sensor Fusion", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets VI, Orlando, FL, April 2001, pp. 1047-1058.

(C146) B. K. Verma. and P. D. Gader, "Fusion of Multiple Handwritten Word Recognition Techniques", Proceedings of the IEEE International Workshop on Neural Networks for Signal Processing, pp. 926-934, Sydney, Australia.

(C147) P. D. Gader and Miroslaw Mystkowski, "Land Mine Detection using Hidden Markov Models: A General Method for Ground Penetrating Radar Analysis", Proceedings of International Conference of the Geo-Science and Remote Sensing Society (IGARSS 2000), Honolulu Hawaii, July 2000, Proceedings on CD-ROM.

(C148) W. Chen and P. D. Gader, "Word Level Discriminative Training for Handwritten Word Recognition", Proceedings of the International Workshop on Frontiers of Handwriting Recognition, Amsterdam, The Netherlands, September 2000, pp. 393-403.

(C149) J. Liu and P. D. Gader, "Outlier Rejection with MLPs and Variants of RBF Networks," 15th International Conference on Pattern Recognition (ICPR'2000), Barcelona, Spain, September 2000, pp. 684-687.

(C150) N. Theera-Umpon and P. D. Gader, "Training Neural Networks to Count White Blood Cells via a Minimum Counting Error Objective Function," 15th International Conference on Pattern Recognition (ICPR'2000), Barcelona, Spain, September 2000, pp. 299-302.

(C151) K. C. Ho and P. D. Gader, "Correlation Based Landmine Detection using GPR," Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets V, Orlando, FL, pp. 1088-1095, April 2000.

(C152) Paul D. Gader, A. Koksal Hocaoglu, Miroslaw Mystkowski, and Yunxin Zhao, "Hidden Markov Models and Morphological Neural Networks for GPR-based Landmine Detection," Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets V, Orlando, FL, pp. 1096-1107, April 2000.

(C153) James M. Keller, Sansanee Auephanwiriyakul, and Paul D. Gader, "New Fuzzy Set Tools to Aid in Predictive Sensor Fusion", Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets V, Orlando, FL, pp. 1497-1509, April 2000.

(C154) M. Khabou, P. D. Gader, and J. M. Keller, "Morphological Shared-Weight Neural Networks: A Tool for Automatic Target Recognition Beyond the Visible Spectrum," Proceedings of the IEEE Workshop on Computer Vision Beyond the Visible Spectrum, (part of CVPR'99), Ft. Collins, CO, June 1999 pp. 101-110.

(C155) J. M. Keller, P. D. Gader, and X. Wang, "LADAR Scene Description using Fuzzy Morphology and Rules," Proceedings of the IEEE Workshop on Computer Vision Beyond the Visible Spectrum, (part of CVPR'99), Ft. Collins, CO, June 1999 pp. 120-130.

(C156) P. D. Gader and M. Mystkowski, "Applications of Hidden Markov Models to Detecting Landmines with Ground Penetrating Radar," Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IV, April 1999, pp. 1085-1093.

(C157) B. N. Nelson, P. D. Gader, and J. M. Keller, "Fuzzy Set Information Fusion in Landmine Detection," Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IV, April 1999, pp. 1168-1177.

(C158) P. D. Gader, H. Frigui, B. Nelson, G. Vaillette, and J. M. Keller, "New Results in Fuzzy Set Based Detection of Landmines with GPR," Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IV, April 1999, pp. 1075-1084.

(C159) Ali Koksal Hocaoglu, P. D. Gader, E. Gelenbe, and T. Kocak, "Optimal of Order Statistics Filters and their Relationship to the Delta-Operator," Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets IV, April 1999, pp. 1323-1329.

(C160) M. Popescu and P. D. Gader, "Image Content Retrieval from Image Databases using Feature Integration by Choquet Integral," Proceedings of the SPIE Conference on Storage and Retrieval for Image and Video Databases VII, San Jose, CA, Jan. 1999.

(C161) W. T. Chen and P. D. Gader, "Word Level Optimization of Dynamic Programming-based Handwritten Word Recognition Algorithms," Proceedings of the SPIE Conference on Document Recognition and Retrieval VI, San Jose, CA, Jan. 1999.

(C162) N. Theera-Umpon and P. D. Gader, "Automated White Blood Cell Counting via Classification-free Granulometric Methods," Proceedings of the SPIE Conference on Nonlinear Image Processing IX, San Jose, CA, Vol. 3646, Jan. 1999, pp. 260-270.

(C163) K. Hocaoglu and P. D. Gader, "Choquet Integral-Based Morphological Operators," Proceedings of the SPIE Conference on Nonlinear Image Processing IX, San Jose, CA, Jan. 1999, pp. 46-56.

(C164) M. Klein, P. D. Gader, and J. Keller, "A Mathematical Programming Approach to Chromosome Karyotyping," Proceedings of the Seventh Industrial Engineering Research Conference, Banff, Alberta, Canada, 2E Optimization Applications, May 1999, pp. 1-9 (CD-ROM).

(C165) J. Park, J. M. Keller, P. D. Gader, and R. Schuchard, "Hough-Based Registration of Retinal Images," Proceedings of IEEE International Conference on Systems, Man, and Cybernetics, La Jolla, CA, October, 1998, pp. 4550-4555.

(C166) H. Frigui, P. D. Gader, J. M. Keller, "Fuzzy Clustering for Land Mine Detection," Proceedings of NAFIPS '98, Pensacola, FL, August 1998, pp. 261-265.

(C167) J. Keller, J. Moore, and P. D. Gader, "A Fuzzy Logic Approach to Detector Scoring," Proceedings of NAFIPS '98, Pensacola, FL, August 1998, pp. 339-345.

(C168) Andrew J. Blanchard, P. D. Gader, A. C. Correa, and A. K. Hocaoglu, "The use of spline based wavelet filtering to improve classification processing of SAR imagery", Proceedings of the IEEE International Conference on Geoscience and Remote Sensing (IGARSS '98), vol. 4, July 1998, pp. 1757-1759.

(C169) P. D. Gader, J. Keller, H. Frigui, H. Liu, and D. Wang, "Landmine Detection Using Fuzzy Sets with GPR Images," Proceedings of the Sixth IEEE International Conference on Fuzzy Systems, Anchorage, AK, May 1998, pp. 232-236 (invited paper).

(C170) H. Frigui, R. Krishnapuram, J. Keller, P. Gader, and D. DeKruger, "Robust and Fuzzy Preprocessing Algorithms for Target Detection in Ladar Range Images," Proceedings of the IEEE International Conference on Fuzzy Systems, Anchorage, AK, May 1998, pp. 67-70.

(C171) J. Keller, P. Gader, R. Krishnapuram, X. Wang, K. Hocaoglu, H. Frigui, and J. Moore, "Fuzzy Logic Automatic Target Recognition System For LADAR Range Images," Proceedings of the IEEE International Conference on Fuzzy Systems, Anchorage, AK, May 1998, pp. 71-76.

(C172) P. D. Gader and J. M. Keller, "Multi-Sensor Fusion with DARPA Backgrounds Data," Proceedings of the SPIE Conference on Detection and Remediation Technologies for Mines and Minelike Targets III, April 1998.

(C173) N. Theera-Umpon, M. Khabou, P. D. Gader, J. M. Keller, H. Shi, and H. Li, "Detection and Classification of MSTAR Objects via Morphological Shared-Weight Neural Networks," Proceedings of the SPIE Conference on Algorithms for Synthetic Aperture Radar Imagery V, April 1998.

(C174) Ali K. Hocaoglu and P. D. Gader, "Choquet Integral Representations of Nonlinear Filters with Applications to LADAR Image Processing," Proceedings of the SPIE Conference on Nonlinear Image Processing IX, San Jose, CA, Feb 1998, pp. 66-72.

(C175) K. Hocaoglu, P. D. Gader, and J. Keller, "A Fuzzy Integral Filter for Object Detection in LADAR Images," Proceedings of NAFIPS '97, Syracuse, NY, September, 1997, pp. 177-182.

(C176) X. Wang, J. Keller, and P. D. Gader, "Using Spatial Relationships as Features in Object Recognition," Proceedings of NAFIPS '97, Syracuse, NY, September, 1997, pp. 160-165.

(C177) P. D. Gader and A. J. Blanchard, "The use of mathematical morphology for accurate detection and identification of microwave images in the K-space domain", Proceedings of the IEEE International Conference on Geoscience and Remote Sensing (IGARSS '97), vol. 2, August 1997, pp. 643-645.

(C178) P. D. Gader, "Fuzzy Spatial Relations Based on Fuzzy Morphology," Sixth IEEE International Conference on Fuzzy Systems (FUZZ-IEEE '97), Barcelona, Spain, July 1997, pp. 1185-1191.

(C179) W. Chen, P. D. Gader, and H. Shi, "Improved Dynamic Programming-Based Handwritten Word Recognition Using Optimal Order Statistics," Proceedings of the SPIE Conference on Statistical and Stochastic Methods in Image Processing II, San Diego, CA, July 1997, pp. 246-256.

(C180) H. Shi, P. D. Gader, and H. Li, "Chromosome Image Segmentation on PAL Parallel Image Processor," Proceedings of the SPIE Conference on Parallel and Distributed Methods for Image Processing, Vol. 3166, July 1997.

(C181) H. Shi and P. D. Gader, "Practical Mesh Algorithms for Finding Shortest Paths in Grid Graphs," Proceedings of the International Conference on Parallel and Distributed Techniques and Applications, Las Vegas, NV, July 1997.

(C182) H. Shi, P. D. Gader, H. Li, and Y-B. Lim, "Finding the Best Cut Between Touching Chromosomes Using Local Operations," Proceedings of the International Conf Parallel and Distributed Techniques and Applications, Las Vegas, NV, July 1997.

(C183) H. Shi and P. D. Gader, "Lexicon-Driven Handwritten Word Recognition Using Choquet Fuzzy Integral," Proceedings of the IEEE Conference on Systems, Man, and Cybernetics, Beijing, China, Oct. 1996, Vol. I, pp. 412-417.

(C184) M. Khabou and P. D. Gader, "Morphological Networks as Solutions of Regularization Problems," Proceedings of the SPIE Conference on Nonlinear Image Processing VIII, San Jose, CA, Feb. 1997 pp. 106-112.

(C185) J.-H. Chiang and P. D. Gader, "A Hybrid Fuzzy Feature Extraction Framework for Handwritten Numeric Fields Recognition," Proceedings of the Fifth IEEE International Congress on Fuzzy Systems, New Orleans, LA, September 1996, pp. 1881-1886.

(C186) H. Shi, P. D. Gader, and J. M. Keller, "An O(K)-Time Implementation of Fuzzy Integral Filters on an Enhanced Mesh Processor Array," Proceedings of the Fifth IEEE International Congress on Fuzzy Systems, New Orleans, LA, September, 1996, pp. 1086-2092.

(C187) P. D. Gader and J. M. Keller, "Fuzzy Methods in Handwriting Recognition: An Overview," Proceedings of NAFIPS '96, Berkeley, CA, June 1996, pp. 137 - 141.

(C188) R. J. Stanley, J. Keller, C. W. Caldwell, and P. D. Gader, "A Centromere Attribute Integration Approach to Centromere Identification," Proceedings of the Rocky Mountain Bioengineering Symposium, Copper Mountain, CO, April 1996, pp. 23 - 29.

(C189) M. A. Leon, P. D. Gader, and J. M. Keller, "Multiple Neural Network Response Variability as a Predictor of Neural Network Accuracy for Chromosome Recognition," Proceedings of the Rocky Mountain Bioengineering Symposium, Copper Mountain, CO, April 1996, pp. 31 - 37.

(C190) Y. Won and P. D. Gader, "A Comparison of Linear and Morphological Shared-Weight Neural Networks," Proceedings of the SPIE Conference on Nonlinear Image Processing VII, San Jose, CA, Jan. 1996, pp. 81-93.

(C191) P. D. Gader and M. Mohamed, "The Choquet Fuzzy Integral in Handwritten Word Recognition," Proceedings of the SPIE Conference on Document Recognition III, San Jose, CA, Jan. 1996, pp. 309 - 321.

(C192) J.-H. Chiang and P. D. Gader, "Improving Digit Recognition Reliability by a Hybrid Neural Model," Proceedings of the International Conference of CFSA/IFIS/SOFT '95 on Fuzzy Theory and Applications, Taipei, Taiwan, Dec. 1995, pp. 182-187.

(C193) Y. Won and P. D. Gader, "Morphological Shared Weight Neural Network for Pattern Classification and Automatic Target Detection," Proceedings of the 1995 IEEE International Conference on Neural Networks, Perth, Australia, Nov. 1995, pp. 2134-2139.

(C194) Classifier Fusion for Handwritten Word Recognition," IEEE Conference on Systems, Man, and Cybernetics, Vancouver, Canada, October 1995, pp. 2329-2335.

(C195) J. M. Keller and P. D. Gader, "Fuzzy Logic and the Principle of Least Committment in Computer Vision," IEEE Conference on Systems, Man, and Cybernetics, Vancouver, Canada, October 1995, pp. 4621-4626.

(C196) P. D. Gader and J.-H. Chiang, "Robust Handwritten Word Recognition with Fuzzy Sets," Proceedings of ISUMA/NAFIPS '95, College Park, MD, Sept. 1995, pp. 198-204.

(C197) E. Dunn, J. Keller, L. Marks, J. Ikerd, and P. D. Gader, "Extending the Application of Fuzzy Sets to the Problem of Agricultural Sustainability," Proceedings of ISUMA/NAFIPS '95, College Park, MD, Sept. 1995, pp. 497-502.

(C198) J. Keller, P. D. Gader, O. Sjahputera, C. W. Caldwell, and H-M. Huang, "A Fuzzy Logic Rule-Based System for Chromosome Recognition," Proceedings of the Eighth IEEE Symposium on Computer-Based Medical Systems, Lubbock TX, June, 1995, pp. 125-132 (invited paper).

(C199) R. J. Stanley, J. Keller, C. W. Caldwell, and P. D. Gader, "Automated Chromosome Classification Limitations Due to Image Processing," Proceedings of the Rocky Mountain Bioengineering Symposium, Copper Mountain, CO, April 1995, pp. 183-188.

(C200) P. D. Gader, M. Andres Mohamed, J. M. Keller, "Applications of Fuzzy Integrals to Handwriting Recognition," Proceedings of the SPIE Conference of Applications of Fuzzy Logic Technology II, April 1995.

(C201) J. Keller, P. D. Gader, and C. Caldwell, "The Principle of Least Commitment in the Analysis of Chromosome Images," SPIE Conference on Applications of Fuzzy Logic Technology, April 1995, pp. 178-186.

(C202) P. D. Gader, J. M. Keller, H. Nair, M. Andres Mohamed, and J. Chiang, "The Principle of Least Commitment in Computer Vision," Proceedings of the Fourth Annual Midwest Electro-Technology Conference, Ames, IA, March 1995.

(C203) M. Mohamed and P. D. Gader, "Generalization of Hidden Markov Models Using Fuzzy Integrals," Proceedings of NAFIPS '94, San Antonio, TX, Dec. 1994.

(C204) P. D. Gader, Y. Won, and M. Khabou, "Image Algebra Networks for Pattern Classification," Proceedings of the SPIE Conference on Image Algebra and Morphological Image Processing V, July 1994.

(C205) P. D. Gader, J. M. Keller, T. Jones, J. Miramonti, and G. Hobson, "MACE Prefiltering for Neural Network Based Automatic Target Recognition," Proceedings of the IEEE International Conference on Neural Networks, Orlando, FL, June 1994.

(C206) P. D. Gader and J. M. Keller, "Applications of Fuzzy Set Theory to Handwriting Recognition," Proceedings of the Third IEEE International Conference on Fuzzy Systems, Orlando, June 1994 (invited paper).

(C207) G. Hobson, S.R. Sims, P. D. Gader, and J. Keller, "MACE Prefiltering Networks for Automatic Target Recognition," Proceedings of the SPIE Conference on Automatic Object Recognition IV, Orlando, FL, April 1994.

(C208) M. Ganzberger, R. Rovner, A. Gillies, D. Hepp, and P. Gader, "Matching Database Records to Handwritten Text," Proceedings of the SPIE Conference on Document Recognition, San Jose, CA, Feb. 1994.

(C209) P. D. Gader and M. A. Khabou, "Automated Feature Generation for Handwritten Digit Recognition," Proceedings of the Third International Workshop on Frontiers of Handwriting Recognition, Buffalo, NY, May 1993.

(C210) P. D. Gader, M. Mohamed, and J. Chiang, "Comparison of Crisp and Fuzzy Character Networks in Handwritten Word Recognition," Proceedings of NAFIPS '92, Puerto Vallarta, Mexico, Dec. 1992, pp. 257-266.

(C211) P. D. Gader, M. Mohamed, and J. Chiang, "Segmentation-Based Handprinted Word Recognition," Proceedings of the Fifth U.S. Postal Service Advanced Technology Conference, Washington, D.C., Nov. 1992, pp. 215-225.

(C212) P. D. Gader, B. Forester, A. Gillies, M. Ganzberger, R. Vogt, and J. Trenkle, "A Segmentation-Free Neural Network Classifier for Machine-Printed Numeric Fields," Proceedings of the U.S. Postal Service Advanced Technology Conference, Washington, D.C., Nov. 1992, pp. A-137-151.

(C213) P. D. Gader, M. Mohamed, and J. Chiang, "Fuzzy and Crisp Handwritten Alphabetic Character Recognition Using Neural Networks," Proceedings of the Artificial Neural Networks in Engineering, St. Louis, MO, Nov. 1992.

(C214) P. D. Gader, "Template Generation for Pattern Classification," Proceedings of the SPIE Conference on Image Algebra and Morphological Image Processing III, July 1992, Vol. 1796.

(C215) P. D. Gader, "Fuzzy Morphological Networks," Proceedings of the First Midwest Electro-Technology Conference, Ames, IA, April 1992.

(C216) W. F. Pont, Jr. and P. D. Gader, "Gradient Descent Techniques for Feature Detection Template Generation," Proceedings of the SPIE Conference on Image Algebra and Morphological Image Processing II, July 1991, Vol. 1568.

(C217) P. D. Gader, D. Hepp, B. Forester, T. Peurach, and B. T. Mitchell, "Pipelined Systems for Recognition of Handwritten Digits in USPS ZIP Codes," Proceedings of U.S. Postal Service Advanced Technology Conference, Washington, D.C., November 1990.

(C218) P. D. Gader and S. Takriti, "Decomposition Techniques for Gray-Scale Morphological Templates," Proceedings of the SPIE Conference on Image Algebra and Morphological Image Processing, San Diego, CA, July 1990, Vol. 1350.

(C219) P. D. Gader and B. Forester, "Integrating Template and Model Matching for Unconstrained Handwritten Numeral Recognition," SPSE Annual Conference, Rochester, NY, May 1990.

(C220) Andres M. Gillies. P. D. Gader, M. P. Whalen, and B.T. Mitchell, "Application of Mathematical Morphology to Handwritten ZIP Code Recognition," Proceedings of the SPIE Conference on Visual Communications and Image Processing IV, Philadelphia, PA, Nov. 1989, Vol. 1199.

(C221) P. D. Gader and E. Dunn, "Image Algebra and Morphological Template Decomposition," Proceedings of the SPIE Conference on Aerospace Pattern Recognition, Orlando, FL, March 1989.

(C222) G. X. Ritter, P. D. Gader, and J. L. Davidson, "Bridge Detection FLIR Images," Proceedings of the Eighth International Conference on Pattern Recognition, Paris, France, October 1986.

(C223) G. X. Ritter and P. D. Gader, "Image Algebra Implementations on Cellular Array Computers," Proceedings of the IEEE Computer Society Workshop on Computer Architecture for Pattern Analysis and Image Database Management, Miami Beach, FL, November 1985.

CONFERENCE PRESENTATIONS

D. K. C. Ho, **P. D. Gader**, Joseph N. Wilson, "Subspace Processing on the Energy Density Spectrum for Landmine Detection", Presented at UXO-Countermine Forum 2007, Orlando FL, August 2007.

J. N. Wilson, **P. D. Gader**, D. K. C. Ho, "Sensor Fusion for Autonomous Mine Detection", Presented at UXO-Countermine Forum 2007, Orlando FL, August 2007.

H. Frigui, Lijun Zhang, and **P. D. Gader**, "Comparison of Different Algorithm Fusion Methods for Landmine Detection with GPR", Presented at UXO-Countermine Forum 2007, Orlando FL, August 2007.

W. H. Lee, **P. D. Gader**, J. N. Wilson, "Optimizing functions of ROC curves for landmine detection", Presented at IEEE International Geoscience and Remote Sensing Symposium, Denver CO.. August 2006.

J. N. Wilson, **P. D. Gader**, T. C. Glenn, K. C. Ho, "Sensor fusion for automated hand-held landmine discrimination", Presented at IEEE International Geoscience and Remote Sensing Symposium, Denver CO.. August 2006.

P. D. Gader "HSI/SAR Fusion Using Choquet Integration for Airborne Mine Detection" Presented at SIAM 2005 National Meeting, Minisymposium on Mathematics in Landmine Detection, New Orleans, LA, July 2005 (invited talk)

P. D. Gader, "Displacement Ranks for Group Matrices," Presented at the SIAM 1988 National Meeting, Minneapolis, MN, July 1988.

P. D. Gader, "Numerical Factorization of Matrices into Products of Local Matrices," Presented at the SIAM Conference on Applied Linear Algebra, Madison, WI, May 1988.

P. D. Gader, "Elementary Number and Group Theory in Computer Science and Engineering," Presented at Wisconsin Section of Math Association of America Annual Meeting, La Crosse, WI, April 1988.

P. D. Gader, "An Algebraic Approach to the Development of Parallel Algorithms for Two-Dimensional Discrete Fourier Transforms," Presented at the SIAM 1986 National Meeting, Boston, MA, July 1986.

TUTORIALS, WORKSHOPS AND SPECIAL PRESENTATIONS

"Probabilistic and Deterministic Unmixing for Imaging Spectroscopy", presented at Dagstuhl Seminar on Hyperspectral, Multispectral, and Multimodal (HMM) Imaging: Acquisition, Algorithms, and Applications, Schloss-Dagstuhl, Leibniz-Zentrum für Informatik, Saarbrücken, Germany, Oct. 9-13, 2017.

"Possibilistic Ambiguity Preserving Classification in Hyperspectral Image Analysis", Distinguished Speaker, College of Engineering, University of Texas – El Paso, Feb. 23, 2017.

"Hyperspectral Image Analysis: How to see inside a pixel", Invited Speaker, Cinvestav (University) Guadalajara, Mexico, November, 2016.

"Nonlinear Unmixing of Hyperspectral Images", Tutorial taught with Dr. Rob Heylen, University of Antwerp, Belgium at the 8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS), Los Angeles, CA, August 2016.

"Hyperspectral Image Analysis", Invited Talk, ECE Department, University of Massachusetts, Amherst, MA, USA, October 2012.

"Nonlinear spectral unmixing: An overview with applications", Invited Talk at Universidad de Las Palmas, Gran Candaria, Canary Islands, September, 2012.

"Models and Algorithms for Linear & Nonlinear Hyperspectral Unmixing", Presentation to Technical Staff of Commonwealth Scientific and Insutrial Research Organisation (CSIRO), July 2012.

"Hyperspectral Image Analysis: How to See Inside a Pixel", Keynote Talk at Alternative Sensing Modalities for Robotic Perception Workshop, part of the Robotic Science and Systems Conference, Sydney, Australia, July 2012.

"Nonlinear Unmixing of Hyperpsectral Images", Invited Talk, University of Pavia, Pavia, Italy, April, 2012.

"Ground Penetrating Radar and Hyperspectral/LIDAR Image Analysis for Buried and Occluded Object Detection" Invited Talk, Naval Surface Warfare Center, Panama City Beach, Florida, USA, October 2011.

"Soft Computing for Hard Pattern Recognition Problems", Keynote Talk at the IEEE Conf. Fuzzy Systems, Taipei, Taiwan, July 2011.

"Piece-wise Convex Hyperspectral Endmember Distribution Detection", Invited Talk, ECE Department, University of Puerto Rico – Mayaguez, Mayaguez, Puerto Rico, December 2010.

"Pattern Recognition for Humanitarian De-Mining", Presentation as a Member of an Invited Panelist for Panel on Applications of Image and Signal Processing in the Preservation of the Environment, International Conference on Pattern Recognition (ICPR 2002), Quebec City, Quebec, Canada, August 2002.

"Hidden Markov Models for Landmine Detection with Ground Penetrating Radar", Presented to the Research Staff of TNO Physics and Electronics Laboratory, The Hague, The Netherlands, September 2000.

"Soft Computing Techniques for GPR Detection and Fusion", Presented at Joint U. S. / European Research on De-mining Technologies, Sponsored by the European Commission's Joint Research Center, the U. S. Army Electronics Technology and Devices Lab, and the European Research Office, Ispra, Italy, July 2000.

"Introduction to Morphological Image Processing," Short course co-taught with Edward Dougherty at the IS&T Symposium on Electronic Imaging Science and Technology, San Jose, CA, Feb. 10, 1997.

"Applications of Fuzzy Sets in Handwriting Recognition," Presented to the Electronic Imaging Working Group Meeting at the IS&T/SPIE Symposium on Electronic Imaging, San Jose, CA, Jan. 30, 1996.

"A Comparison of Fuzzy Logic and Neural Network Methods for Street Number Location in Handwritten Addresses," Presented to the Bay Area OCR Group at Apple Computer, San Jose, CA, Feb. 1, 1996.

FUNDED RESEARCH Total :: \$15.3 Million

Sponsors

- Air Force
- Army
- DARPA
- DoD

•	Geo-Centers	(Industry)
•	Harris	(Industry)
•	Missouri Dept. of Transportation	
•	National Science Foundation	
•	Sandia National Lab	
•	Signalscape	(Industry)
•	Strategic Environmental R & D Program	
•	U. S. Postal Service	
•	Electronics and Space Corporation	(Industry)

TEACHING

Ph.D. Dissertations Supervised (22)

- 2017 Possibilistic Classification Using Gaussian Process Prior by Leila Kalantari
- 2014 Normalized Maximum Likelihood on Variable Length Sequence Datasets by Joshua Horton
- 2014 Bayesian Hyperspectral Unmixing and Endmember Detection with MultiVariate Beta Distributions by Dmitri Dranishnikov
- 2013 Context-Dependent Detection in Hyperspectral Imagery by Taylor Glenn
- 2011 Endmember And Proportion Estimation Using Physics-Based Macroscopic And Microscopic Mixture Models by Ryan Close
- 2011 Context-Based Classification Via Data-Dependent Mixtures Of Logistic And Hidden Markov Model Classifiers by Seniha Esen Yuksel
- 2010 *Fast Physics-Based Methods for Wideband Electromagnetic Induction Data Analysis* by Ganesan Ramachandran
- 2009 Robust Kernel Methods in Context-dependent Fusion by Gyeongyong Heo
- 2009 Automatic Feature Learning and Parameter Estimation for Hidden Markov Models Using MCE and Gibbs Sampling by Xuping Zhang
- 2009 Optimized Dictionary Design and Classification Using the Matching Pursuits Dissimilarity Measure by Raazia Mazhar
- 2008 Hyperspectral Endmember Detection and Band Selection Using Bayesian Methods by Alina Zare
- 2008 Random Set Framework for Context-Based Classification by Jeremy Bolton
- 2008 Information Fusion and Sparsity Promotion using Choquet Integrals by Andres Mendez-Vazquez.
- 2007 *Piecewise Linear Lattice Based Associative Memories* by John McElroy.
- 2003 New Sequence Processing Algorithms using Hidden Markov Models by Mihail Popescu.
- 2000 Choquet Integral Based Morphological Operators with Applications to Object Detection and Information Fusion by Ali Koksal Hocaoglu.
- 2000 Word Level Training of Handwritten Word Recognition Systems by Wen-Tsong Chen.
- 2000 Morphological Granulometric Estimation with Random Primitives and Applications to Blood Cell Counting by Nipon Theera-Umpon.

- 1999 Improving Shared-Weight Neural Networks Generalization Using Regularization Theory and Entropy Maximization by Mohamed Khabou.
- 1995 Handwritten Word Recognition using Generalized Hidden Markov Models by Magdi Mohamed.
- 1995 Nonlinear Correlation Filter and Morphology Neural Networks for Image Pattern and Automatic Target Recognition by Yonggwan Won.
- 1995 Hybrid Fuzzy Neural Systems for Robust Handwritten Word Recognition by Jung-Hsien Chiang.

Post-Doctoral Associates Supervised

- 1) Dr. H. Frigui (Dec 97 Aug 98) (University of Missouri)
- 2) Dr Brijesh Verma (Jan 99 Nov 99) (University of Missouri)
- 3) Dr. Jinhui Liu (Jan 99 December 2000) (University of Missouri)
- 4) Dr. Miroslaw Mystkowsky (Dec 99 Aug 01) (University of Missouri)
- 5) Dr. Nipon Theera-Umpon (May 00 May 01) (University of Missouri)
- 6) Dr. Guoqing Liu (joint with Dr. Li of ECE) (Oct. 01 Aug 02) (University of Florida)
- 7) Dr. Ali Koksal Hocaoglu (Fall 01 August 04) (University of Missouri and University of Florida)
- 8) Dr. Wen-Hsiung Lee (Spring 02 Aug 06) (University of Florida)
- 9) Dr. Alina Zare (January 2009 August 2010) (University of Florida)
- 10) Dr. Jeremy Bolton (January 2009 2012 (University of Florida)
- 11) Dr. Rob Heylon (Oct. 2012 April 2013) (University of Florida)
- 12) Dr. Hamdi Jenzri (August 2014 December 2014) (University of Florida)

COURSES TAUGHT AT THE UNIVERSITY OF MISSOURI

CECS 476:	Pattern Recognition (Graduate Course)
ECE 471:	Neural Network Based Computing Systems (Graduate Course)
CS 425:	Artificial Intelligence II (Graduate Course)
ECE 474:	Artificial Intelligence (Graduate Course)
ECE 458:	Introduction to Modeling and Management of Uncertainty (Graduate Course)
ECE 401:	Image Algebra and Morphological Image Processing (Graduate Course)
ECE 365:	Introduction to Digital Image Processing (Senior Lab Course)
ECE 227:	Algorithms and Software Design with the C Language (Junior Course)
ENGR 20:	Introduction to Computer Programming with PASCAL (Freshman Course)

COURSES TAUGHT / DEVELOPED WHILE AT THE UNIVERSITY OF FLORIDA (Including courses while a Visiting Professor designated by *)

CAP 6617	Advanced Machine Learning (Graduate Course) (I developed into regular course)
CAP 6615	Neural Networks for Computing (Graduate Course)
CAP 6610:	Machine Learning (Graduate Course)
CAP 4621:	Artificial Intelligence (Senior Course)
CAP 4410:	Digital Image Processing (Senior Course)
COT 3100:	Applied Discrete Structures (Junior Course)
CIS 6930:	Fuzzy Sets and Fuzzy Logic (Graduate Special Topics)
CIS 6930/COT 5615:	Math for Intelligent Systems (Grad Special Topics) (I developed into regular course)
CIS 6930	Hidden Markov Models (Graduate Special Topics Course)
CIS 6930	Subsurface Sensing Algorithms (Graduate Special Topics Course)
CIS 6930	Elements of Statistical Learning (Grad Special Topics Course, co-taught with Statistics)
CIS 4930	Introduction to Computational Intelligence (Undergraduate Special Topics Course)
CIS 6930/4930	Hyperspectral Image Analysis (Graduate / Undergraduate Special Topics Course)
ENV 6932	Computer Programming for Environmental Research (Graduate Special Topics Course)

*Winter 2016 Deep Learning (Graduate Course), University of California – Santa Barbara, CS Department
*Winter 2012 Digital Image Processing (Undergraduate Course), Grenoble Institute of Technology, France

National / International SERVICE

Tutorial:	Tutorials and Short Courses Nonlinear Unmixing for Hyperspectral Images and Imaging Spectroscopy
	(with Dr. Rob Heylen, University of Antwerp, Belgium)
	8 th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS) August 2016.
	10th European Association of Remote Sensing Laboratories (EARSeL), Imaging Spectroscopy Workshop, April 2017
Short Course:	Classification of Hyperspectral Data using Python NSF National Ecological Observatory Network (NEON) Data Skills Workshop, June 2017.
	Panels
Pattern Recogn	nition for Humanitarian Demining, ICPR Panel, (2002).
Invited serve V	White House Science panel on Evaluation of New Technologies for Humanitarian Demining, (2002)
Member of Un	ited States Army Hand-held Standoff Mine Detection System Red Team, (1998-1999).
NSF Panel, Int	eractive Systems Division, (Gary Strong, Program Director), (1996).
Fellow Member	Memberships International Institute of Electrical and Electronics Engineers (IEEE) Society of Photo-Optical and Instrumentation Engineers (SPIE)
IEEE Society/	International Committees Fechnical Council Fellow Evaluation Committee, 2011
	Honors
University of I	Florida Research Foundation Professor
Outstanding Ju	mior Faculty Research Award, University of Missouri, College of Engineering, March 1996.
Technical Dire (University of	ctor of Army Research Office Multi-University Research Initiative on Humanitarian De-Mining. Missouri, University of Kansas, and Carnegie Mellon University), (1999-2002).

Best Paper Award, IEEE Transactions Fuzzy Systems, 2000.

Associate Editor

IEEE Geoscience and Remote Sensing Letters (2009 – 2013) IEEE Transactions Fuzzy Systems (2004-2007) Journal of Mathematical Imaging and Vision Journal of Electronic Imaging (1996-1999)

Journal Guest Editor

IEEE Signal Processing Magazine, Hyperspectral Signal and Image Processing, 2012-13 IEEE Transactions on Fuzzy Systems, Special Issue on Recognition Technology, February 2001. Journal of Mathematical Imaging and Vision, September 1992.

Conference Chair

SPIE Conference on Image Algebra and Morphological Image Processing (1990-1994) IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (2013).

Area/Theme Chair

Landmine and Unexploded Ordnance Detection, IEEE Int'l Conference Geo-science and Remote Sensing (2010) Landmine and Unexploded Ordnance Detection, IEEE Int'l Conference Geo-science and Remote Sensing (2008) Pattern Recognition and Image Processing, IEEE Int'l Conference Neural Networks, (1997). Pattern Recognition and Clustering Area, IEEE Int'l Conference Fuzzy Systems, (1998).

Keynote Speaker

IEEE International Conference on Fuzzy Systems, Taipei, Taiwan (2011) Robotics Science and Systems, Sydney, Australia, (2012)

Session Chair

IEEE World Congress on Computational Intelligence, Special Session on AGOPs in Practice, (2008) IEEE Int'l Conference Geo-science and Remote Sensing, Special Session Subsurface Sensing, (2008) International Workshop on Frontiers of Handwriting Recognition, (September 2000) Detection & Remediation Technologies for Mines and Minelike Targets (2000-2009) IEEE International Conference on Fuzzy Systems (1998, 2003) Fuzzy Sets in Handwriting Recognition, NAFIPS '96 (June 1996) IEEE Conference on Systems, Man, and Cybernetics (October 1995)

Program Committee

IEEE Workshop on Hyperspectral Image and Signal Processing:Evolution in Remote Sensing, (2011-2012) IEEE International Conference on Fuzzy Systems (1998, 2001, 2003, 2005, 2008) IEEE International Conference on Geo-science and Remote Sensing (2004, 2008, 2010, 2013) International Workshop on Frontiers of Handwriting Recognition, (2000, 2006) IEEE Workshop Computer Vision Beyond the Visible Spectrum (1999-2001) International Conference on Pattern Recognition (ICPR) (1998, 2006) SPIE Conference on Nonlinear Imaging (1996-1998) NAFIPS (1996, 2001, 2002)

Organizing Committee

IEEE World Congress on Computational Intelligence (2010)

Paper Reviewer

IEEE Computer

IEEE Geoscience and Remote Sensing Letters

- IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)
- IEEE Sensors
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Fuzzy Systems
- IEEE Transactions on Image Processing
- IEEE Transactions on Knowledge and Data Engineering
- IEEE Transactions on Signal Processing
- IEEE Transactions on Antennas and Propagation

- IEEE Transactions on Geoscience and Remote Sensing
- IEEE Transactions on Systems, Man, and Cybernetics
- IEEE World Congress on Computational Intelligence (WCCI)
- IEEE Workshop Hyperspectral Image & Signal Analysis... (WHISPERS)

Fuzzy Sets and Systems

Journal of Information Fusion

Journal of Information Science

International Conference on Pattern Recognition (ICPR)

International Conference Neural Networks (ICNN)

International Conference on Frontiers of Handwriting Recognition (ICFHR)

International Workshop on Frontiers of Handwriting Recognition (IWFHR)

ISPRS Journal of Photogrammetry and Remote Sensing

Journal of Real-Time Imaging

Journal of Mathematical Imaging and Vision

Journal of Electronic Imaging

Pattern Recognition Letters

Pattern Recognition

Signal Processing

David D. Hibbitts, Ph.D.

Position	Assistant Professor August 2015 – Present University of Florida Department of Chemical Engineering 221 Chemical Engineering Building Gainesville, FL 32611 USA	 !S hibbitts@che.ufl.edu % hibbitts.rc.ufl.edu W @HibbittsCatLab 1S Google Scholar
Research Interests	 Fundamental insights into heterogeneous catalysis: Use kinetic, isotopic, and theoretical studies on well-def Determine mechanisms and active sites for reactions of fo Establish structure-function relationships to develop an Design interfaces to improve accuracy and efficiency of the structure of the	ined catalysts. ssil- and biomass-based chemicals. d improve catalytic materials. theoretical methods.
Post-Doctoral Research	University of California , Berkeley, CA Chemical Engineering Advisor: Prof. Enrique Iglesia	Oct 2012 – July 2015
Education	University of Virginia , Charlottesville, VA Ph.D., Chemical Engineering Advisor: Prof. Matthew New	August 2012 1rock
	Clemson University , Clemson, SC B.S. cum Laude, Chemical Engineering	May 2007
Recent Awards	 NSF CAREER Award, 2020-2024 American Chemical Society Petroleum Research Fund N Outstanding Service Award, UF Department of Chemica 	DI Award, <i>2016-2018</i> al Engineering, <i>2017</i>
Journal Publications	[1] A. Hoffman, ^G J. Bates, J. Di Iorio, S. Nystrom, ^G C. Nimlos, R. Gounder, and D. Hibbitts. [*] "Rigid arrangements of ionic charge in zeolite frameworks conferred by specific Al distributions preferentially stabilize alkanol dehydration transition states." <i>Submitted</i> (2019)	
Total: 36 Independent:	[2] L. Kilburn, ^U M. DeLuca, ^G A. Hoffman, ^G and D. Hibbitts. [*] " and formaldehyde-mediated diene Formation routes in a and CHA zeolites." Submitted (2019)	Comparing alkene disproportionation methanol-to-olefins catalysis in MFI
18 Citations: 1908	[3] P. Kravchenko, ^G V. Krishnan, ^G and D. Hibbitts.* "Mecha particle morphology on Rh-catalyzed NO-H ₂ reactions (2020) doi:10.1021/acs.jpcc.0c04024	anism and effects of coverage and s." <i>J. Phys. Chem. C, In Press</i> .
H-index: 18	[4] M. Allen, A. Hoffman, ^G TW. Liu, ^G D. Hibbitts, [*] and The cross-etherification of 5-hydroxymethylfurfural with ethat	omas Schwartz.* "Highly selective nol." <i>ACS Catal. 10</i> (2020) 6771–
^G Grad. Student	 6785. [5] A. Almithn^G and D. Hibbitts.* "Impact of metal and heteroa of C–X bonds (X = C, N, O, S, and Cl)" ACS Catal. 10 	atom identities in the hydrogenolysis (2020) 5086–5100.
^U Undergrad. Student	[6] M. DeLuca, ^G C. Janes, ^U and D. Hibbitts. [*] "Contrasting arer hydrogenation in H-ZSM-5, H-SSZ-13, and H-SAPO-34 ACS Catal. 10 (2020) 4593–4607.	ne, alkene, diene, and formaldehyde 4 zeolite frameworks during MTO."
Corresp. Author	 [7] Pavlo Kravchenko,^G C. Plaisance,[] and D. Hibbitts.[*] "A catalysis." <i>Pre-print available</i> (2019). 	new computational interface for
	[8] M. DeLuca ^G and D. Hibbitts. [*] "Prediction of C_6-C_{12} in zeolite-specific kinetic Monte Carlo simulation method <i>Pre-print available</i> (2019).	terconversion rates using novel s."
	[9] J. Di Iorio, A. Hoffman, ^G C. Nimlos, S. Nystrom, ^G D. Hibbi origins of the high-pressure inhibition of methanol deh zeolites." <i>J. Catal.</i> 380 (2019) 161–177.	tts,* and R. Gounder.* "Mechanistic ydration rates in small-pore acidic
	[10] M. Witzke, A. Almithn, ^G C. Coonrod, M. Triezenberg, E situ methods for identifying reactive surface intermediate C–O bond cleavage on nanoparticles of nickel and nick <i>J. Amer. Chem. Soc.</i> 141 (2019) 16671–16684.	 Hibbitts,* and D. Flaherty.* "In es during hydrogenolysis reactions: el phosphides"

[11]	M. DeLuca, ^G P. Kravchenko, ^G and D. Hibbitts. [*] "Mechanism and kinetics of methylating
	C ₆ –C ₁₂ methylbenzenes with methanol and DME in H-MFI zeolites."
	ACS Catal. 9 (2019) 6444–6460. Front Cover Article

- [12] A. Hoffman,^G M. DeLuca,^G and D. Hibbitts.* "Restructuring of MFI framework zeolite models and their associated artifacts in density functional theory calculations." J. Phys. Chem. C. 123 (2019) 6572-6585. Editor's Choice
- [13] A. Aalmithn^G and D. Hibbitts.* "Comparing rate and mechanism of ethane hydrogenolysis on transition metal catalysts." J. Phys. Chem. C. 123 (2019) 5421-5432.
- [14] M. Cordon, J. Harris, J. Vega-Vila, J. Bates, S. Kaur, ^G M. Gupta, ^G M. Witzke, E. Wegener, J. Miller, D. Flaherty, D. Hibbitts, and R. Gounder.* "The dominant role of entropy in stabilizing sugar isomerization transition states within hydrophobic zeolite pores." J. Amer. Chem. Soc. 140 (2018) 14244-14266.
- [15] S. Nystrom, G A. Hoffman, G and D. Hibbitts.* "Tuning Bronsted acid strength by altering site proximity in CHA framework zeolites." ACS Catal. 8 (2018) 7842-7860.
- [16] M. Witzke, G A. Aalmithn, G C. Coonrod, D. Hibbitts,* and D. Flaherty.* "Mechanisms and active sites for C–O bond rupture within 2-methyltetrahydrofuran over nickel phosphide catalysts." ACS Catal. 8. (2018) 7141-7157.
- [17] A. Aalmithn^G and D. Hibbitts.* "Effects of Catalyst Model and High Adsorbate Coverages in ab initio Studies of Alkane Hydrogenolysis." ACS Catal. 8 (2018) 6375-6387.
- [18] A. Aalmithn^G and D. Hibbitts.* "Supra-monolayer coverages on small metal clusters and their effects on H₂ chemisorption particle size estimates." AIChE J. 64 (2018) 3109-3120. (Invited)
- [19] R. Rao, R. Blume, T. Hansen, E. Fuentes, K. Dreyer, ^U S. Moldovan, O. Ersen, D. Hibbitts, Y. Chabal, R. Schlögl, and J.-P. Tessonnier. "Interfacial charge distributions in carbonsupported palladium catalysts." Nature Comm. 8 (2017) 340.
- [20] J. Liu, D. Hibbitts, and E. Iglesia. J. Amer. Chem. Soc. 139 (2017) 11789-11802. Selected
- [21] D. Hibbitts and E. Iglesia. Acc. Chem. Res. 48 (2015) 1254-1262. Post-Doc.
- [22] D. Flaherty, D. Hibbitts, and E. Iglesia. J. Amer. Chem. Soc. 136 (2014) 9664–9676. Publications
- [23] D. Hibbitts, B. Loveless, M. Neurock, and E. Iglesia. Angew. Chemie, Int. Ed. 125 (2013) (12 Omitted) 12499-12504.
 - [24] M. Chia, Y. Pagan-Torres, D. Hibbitts, O. Tan, H. Pham, A. Datve, M. Neurock, R. Davis, J. Dumesic. J. Amer. Chem. Soc. 133 (2011) 12675-12689.
 - [25] B. Zope, D. Hibbitts, M. Neurock, R. Davis. Science. 330 (2010) 74-78.
- Presentations 11 Past and Upcoming Departmental Seminars
 - 30 National Conference Presentations (7 invited)
 - 25 Student / Collaborator Presentations

Funding, PI on all awards, 3 awarded AY 2019-2020 Grants

^PMv portion

Ph.D. /

- NSF (CHEM) (Recommended) "Collaborative: Separating Electronic and Geometric Effects in Compound Catalysts: Examining Unique Selectivities for C-O Hydrogenolysis on Transition Metal Phosphides" (Lead) \$672,000 \$239,000^P, May 2020 – Apr 2023.
 - NSF (CBET) "CAREER: Elucidating Mechanisms and the Effects of Zeolite Framework, Acid Site Location and Strength in Methanol-to-Hydrocarbon Reactions" \$554,000 P, Jan 2020 -Dec 2025.
 - NSF (CBET) "Understanding and Controlling Wax-Water Interactions in Pores of Fischer-Tropsch Synthesis Catalysts. (1933054)" \$450,000 \$275,000^P, Aug 2019 – July 2022.
 - NSF (CBET) "Collaborative: GOALI: Identifying the roles of atomically dispersed Rh, support interactions, and environmental conditions in automotive NO reduction catalysis. (1803165)" \$450,000 \$225,000^P, Sept 2018 - Aug 2021.
 - ACS PRF "Effects of Zeolite Topology for Conversion of Methanol/Ethanol to Hydrocarbons: Toward Computer-Directed Synthesis (57079-DNI5)", \$110,000, Sept 2016 – Aug 2019.

Parisa Rashidi, PhD

Intelligent Health Lab (iHeal), Department of Biomedical Engineering, University of Florida 1064 Center Drive, NEB 459, Gainesville, FL 32611 Office Phone: (352) 392-9469 E-mail: parisa.rashidi@ufl.edu

APPOINTMENTS

University of Florida Associate Professor Assistant Professor Department of Biomedical Engineering Affiliated, Department of Electrical & Computer Engineering Affiliated, Department of Computer & Information Science & Engineering Affiliated Department of Aging and Geriatric Research	Gainesville, FL August 2020 - Present August '13 – 2020
Northwestern University, Feinberg School of Medicine Assistant Professor, Center on Health and Engineering Affiliated, Department of Computer Science	Chicago, IL September '12 – June '13
University of Florida Research Scientist, Department of Computer & Information Science & Engineering	Gainesville, FL September '11 – May '12
Washington State University Graduate Research Assistant	Pullman, WA September '06 – May '11
Microsoft Research Intern, Health Systems Group	Washington, D.C. June '09 – September '09
Microsoft Research Intern, Robotics Group	Redmond, WA June '08 – September '08
EDUCATION	
Washington State University Research Area: Activity Recognition, Machine Learning	Ph.D., Computer Science May 2011

Washington State University Research Area: Activity Recognition, Machine Learning

University of Tehran Area: Intelligent Systems

University of Tehran Area: Software Engineering M.Sc., Computer Science December 2007

Graduate Coursework May 2006

B.S., Computer Engineering September 2005

HONORS & AWARDS

2020	Pruitt Family Endowed Faculty Fellowship, University of Florida
2019	Faculty Research Excellence Award, Biomedical Engineering Department (BME), University of Florida
2019	Mitchell Max Award Finalist, National Institute of Health (NIH)
2019	Excellence Award for Assistant Professors, University of Florida (UF Excellence Award)
2019	Excellence Award for Assistant Professors, Herbert Wertheim College of Engineering (HWCOE Excellence Award)
2019	National Institute of Health (NIH), Trailblazer Award
2019	Senior Member Grade, Institute of Electrical and Electronics Engineers (IEEE)
2018	University of Florida Term Professorship, Excellence in Research, Teaching, Service
2018	National Science Foundation Faculty Early Career Development Program (NSF CAREER)
2017	National Academy of Engineering (NAE), Frontiers of Engineering (FOE)
2015	Biomedical Engineering Society (BMES), Career Development Award
2015	Microsoft Faculty Summit Invited Participant
2014	National Science Foundation Travel Award, Computing Challenges in Future Mobile Health Systems and Applications Workshop
2011	The Outstanding Dissertation Award, Washington State University, WA
2006	Graduate Research Award, Washington State University, WA
2005	Max-Planck Summer School Travel award, Germany

PUBLICATIONS

Summary:

Total Citation Count	
h-index	
i10-index	

4700+ 25 42

Google Scholar Link

Journal Articles

- Alpert, Jordan, Todd Manini, Roberts, Megan Roberts, Naga Probhakar Kota, Tona Mendoza, Laurence Solberg, and <u>Parisa Rashidi</u>. "Secondary Care Provider Attitudes Towards Patient Generated Health Data from Smartwatches". *Nature (NPJ) Digital Medicine*, 3, no. 27 (2020): 1-7.
- Bandyopadhyay, Sabyasachi, Nicholas Lysak, Lasith Adhikari, Laura M. Velez, Larysa Sautina, Rajesh Mohandas, Maria-Cecilia Lopez Ungaro, Ricardo, Peng, Ying-Chih, Kadri, Ferdous, Efron, Philip, Brakenridge, Scott, Moldawer, Lyle, Moore, Frederick, Baker, Henry V., Segal, Mark S., Ozrazgat-Baslanti, Tezcan, **Rashidi, Parisa**, Bihorac, Azra. "Discovery and Validation of Urinary Molecular Signature of Early Sepsis." *Critical Care Explorations* 2, no. 10 (2020): e0195.
- 3. Loftus, Tyler J., Amanda C. Filiberto, Jeremy Balch, Alexander L. Ayzengart, Patrick J. Tighe, **Parisa Rashidi**, Azra Bihorac, and Gilbert R. Upchurch Jr. "Intelligent, Autonomous Machines in Surgery." *Journal of Surgical Research* 253 (2020): 92-99.
- 4. Datta, Shounak, Tyler J. Loftus, Matthew M. Ruppert, Chris Giordano, Gilbert R. Upchurch Jr, **Parisa Rashidi**, Tezcan Ozrazgat-Baslanti, and Azra Bihorac. "Added Value of Intraoperative Data for Predicting Postoperative Complications: The MySurgeryRisk PostOp Extension." *Journal of Surgical Research* 254 (2020): 350-363.
- Loftus, Tyler J., Amanda C. Filiberto, Yanjun Li, Jeremy Balch, Allyson C. Cook, Patrick J. Tighe, Philip A. Efron, Gilbert R. Upchurch, **Parisa Rashidi**, Xiaolin Li, Azra Bihorac. "Decision analysis and reinforcement learning in surgical decision-making." *Surgery* (2020).
- 6. Ong, Triton L., Matthew M. Ruppert, Maisha Akbar, **Parisa Rashidi**, Tezcan Ozrazgat-Baslanti, Azra Bihorac, and Marko Suvajdzic. "Improving the Intensive Care Patient Experience with Virtual Reality—A Feasibility Study." *Critical Care Explorations* 2, no. 6 (2020): e0122.
- 7. Loftus, Tyler J., Patrick J. Tighe, Amanda C. Filiberto, Jeremy Balch, Gilbert R. Upchurch Jr, **Parisa Rashidi**, and Azra Bihorac. "Opportunities for machine learning to improve surgical ward safety." *The American Journal of Surgery* (2020).
- 8. <u>Rashidi, Parisa</u>, and Azra Bihorac. "Artificial Intelligence Approaches to Improve Kidney Care." *Nature Reviews Nephrology*, (2019): 1-2.
- 9. Davoudi, Anis, Todd M. Manini, Azra Bihorac, and Parisa Rashidi. "Role of Wearable

Accelerometer Devices in Delirium Studies: A Systematic Review." Critical Care Explorations, 1, no. 9 (2019): e0027.

- Tighe, Patrick, David E. Edwards, and <u>Parisa Rashidi</u>. "Primer on Machine Learning: Utilization of Large Data Set Analyses to Individualize Pain Management Current Opinion in Anesthesiology." *Current Opinion in Anesthesiology*, 1, no. 9 (2019): e0027.
- Tighe, Patrick, Benjamin Shickel, Sannapaneni, Bharadwaj, Charles Doyle, Michael Kent, and <u>Parisa Rashidi</u>. "42 Million Ways to Describe Pain: Topic Modeling of 200,000 PubMed Pain-Related Abstracts Using Natural Language Processing and Deep-Learning–Based Text Generation." *Pain Medicine*, 10, no. 10, (2020): 1-28.
- 12. Loftus, Tyler John, Gilbert R. Upchurch, Daniel Delitto, **Parisa Rashidi**, and Azra Bihorac. "Mysteries, Epistemological Modesty, and Artificial Intelligence in Surgery." *Frontiers in Artificial Intelligence*, 2 (2019): 32.
- 13. Loftus, Tyler J., Patrick J. Tighe, Amanda C. Filiberto, Philip A. Efron, Scott C. Brakenridge, Alicia M. Mohr, **Parisa Rashidi**, Gilbert R. Upchurch, and Azra Bihorac. "Artificial Intelligence and Surgical Decision-Making." *JAMA surgery*, 155, no. 2 (2020): 148-158.
- 14. Lysak, Nicholas., Haleh Hashemighouchani, Anis Davoudi, Negin Pourafshar, Tyler J. Loftus, Matthew Ruppert, Phil A. Efron, Parisa Rashidi, Azra Bihorac, and Tezcan Ozrazgat-Baslanti. "Cardiovascular death and progression to end-stage renal disease after major surgery in elderly patients." *British Journal of Surgery Open*, 4, no. 1 (2020): 145-156.
- 15. Davoudi, Anis, Kumar Rohit Malhotra, Benjamin Shickel, Scott Siegel, Seth Williams, Matthew Ruppert, Emel Bihorac, Tezcan Ozrazgat-Baslanti, Patrick J. Tighe, Azra Bihorac, and <u>Parisa Rashidi</u>. "Intelligent ICU for Autonomous Patient Monitoring Using Pervasive Sensing and Deep Learning." *Scientific Reports*, 9, no. 1 (2019): 8020-8033.
- Shickel, Benjamin, Tyler J. Loftus, Lasith Adhikari, Tezcan Ozrazgat-Baslanti, Azra Bihorac, and <u>Parisa Rashidi</u>. "DeepSOFA: A Continuous Acuity Score for Critically Ill Patients using Clinically Interpretable Deep Learning." *Scientific Reports 9*, no. 1 (2019): 1879-1891.
 - ★ Top 5% of all research outputs scored by Altmetric. Featured in CBS, Fox, UF Health News, NPR Local News.
- Manini, Todd Matthew, Tonatiuh Mendoza, Manoj Battula, Anis Davoudi, Matin Kheirkhahan, Mary Ellen Young, Eric Weber, Roger Benton Fillingim, and <u>Parisa Rashidi</u>. "Perception of Older Adults Toward Smartwatch Technology for Assessing Pain and Related Patient-Reported Outcomes: Pilot Study." *JMIR mHealth and uHealth* 7, no. 3 (2019): e10044.

€ Impact Factor 4.5, #2 in Medical Informatics by Thomson Reuters.

- 19. Adhikari, Lasith, Tezcan Ozrazgat-Baslanti, Matthew Ruppert, RWMA Madushani, Srajan Paliwal, Haleh Hashemighouchani, Feng Zheng, Ming Tao, Juliano M Lopes, Xiaolin Li,

Parisa Rashidi, Azra Bihorac. "Improved predictive models for acute kidney injury with IDEA: Intraoperative Data Embedded Analytics." *PLOS One* 14, no. 4 (2019): e0214904.

- Ebadi, Ashkan, Patrick J. Tighe, Lei Zhang, and <u>Parisa Rashidi</u>. "A quest for the structure of intra-and postoperative surgical team networks: does the small-world property evolve over time?." *Social Network Analysis and Mining* 9, no. 1 (2019): 7.
- 21. Mollalo, Abolfazl, Liang Mao, Parisa Rashidi, and Gregory E. Glass. "A GIS-Based Artificial Neural Network Model for Spatial Distribution of Tuberculosis across the Continental United States." *International Journal of Environmental Research and Public Health* 16, no. 1 (2019): 157.
- 22. Kheirkhahan, Matin, Sanjay Nair, Anis Davoudi, Parisa Rashidi, Amal A. Wanigatunga, Duane B. Corbett, Tonatiuh Mendoza, Todd M. Manini, and Sanjay Ranka. "A Smartwatch-Based Framework for Real-Time and Online Assessment and Mobility Monitoring." *Journal of Biomedical Informatics* 89 (2019): 29-40.
- 23. Shickel, Benjamin, Patrick James Tighe, Azra Bihorac, and <u>Parisa Rashidi</u>. "Deep EHR: A Survey of Recent Advances in Deep Learning Techniques for Electronic Health Record (EHR) Analysis." *IEEE Journal of Biomedical and Health Informatics (IEEE JBHI)* 22, no. 5 (2018): 1589-1604.
 - ★ Among Top 3 IEEE JBHI Articles of All Time. 6000+ Downloads, Citation Count: 180+, In the top 5% of all research outputs scored by Altmetric.
- 24. Mollalo, Abolfazl, Ali Sadeghian, Glenn D. Israel, Parisa Rashidi, Aioub Sofizadeh, and Gregory E. Glass. "Machine Learning Approaches In GIS-Based Ecological Modeling of The Sand Fly Phlebotomus Papatasi, A Vector of Zoonotic Cutaneous Leishmaniasis In Golestan Province, Iran." Acta Tropica 188 (2018): 187-194.
- 25. Bihorac, Azra, Tezcan Ozrazgat-Baslanti, Ashkan Ebadi, Amir Motaei, Mohcine Madkour, Panagote Pardalos, Gloria Lipori, William Hogan, Philip Efron, Frederick Moore, Lyle Moldawer, Daisy Wang, Charles Hobson, **Parisa Rashidi**, Xiaolin Li, Petar Momcilovic. "MySurgeryRisk: Development and Validation of a Machine-Learning Risk Algorithm for Major Complications and Death After Surgery." *Annals of Surgery* 269, no. 4 (2019): 652-662.
- Nickerson, Paul V., Raheleh Baharloo, Amal A. Wanigatunga, Todd M. Manini, Patrick J. Tighe, and <u>Parisa Rashidi</u>. "Transition Icons for Time-Series Visualization and Exploratory Analysis." *IEEE Journal of Biomedical and Health Informatics (IEEE JBHI)* 22, no. 2 (2018): 623-630.
 - € Featured cover article, March 2018.
- Suvajdzic, Marko, Azra Bihorac, Parisa Rashidi, Triton Ong, and Joel Applebaum. "Virtual reality and human consciousness: The Use of Immersive Environments in Delirium Therapy." *Technoetic Arts* 16, no. 1 (2018): 75-83.
- 28. Ebadi, Ashkan, Josué L. Dalboni da Rocha, Dushyanth B. Nagaraju, Fernanda Tovar-Moll, Ivanei Bramati, Gabriel Coutinho, Ranganatha Sitaram, and <u>Parisa Rashidi</u>. "Ensemble Classification of Alzheimer's Disease and Mild Cognitive Impairment Based on Complex Graph Measures from Diffusion Tensor Images." *Frontiers in Neuroscience* 11 (2017): 56.

- Ebadi, Ashkan, Patrick J. Tighe, Lei Zhang, and <u>Parisa Rashidi</u>. "DisTeam: A Decision Support Tool for Surgical Team Selection." *Artificial Intelligence in Medicine* 76 (2017): 16-26.
 - ★ Selected as Best article by the International Medical Informatics Association (IMIA) in the 'Clinical Decision Support' category.
- 30. Ozrazgat-Baslanti, Tezcan, Paulette Blanc, Paul Thottakkara, Matthew Ruppert, Parisa Rashidi, Petar Momcilovic, Charles Hobson, Philip A. Efron, Frederick A. Moore, and Azra Bihorac. "Preoperative Assessment of The Risk for Multiple Complications After Surgery." Surgery 160, no. 2 (2016): 463-472.
- Tighe, Patrick J., Paul Nickerson, Roger B. Fillingim, and <u>Parisa Rashidi</u>. "Characterizations of Temporal Postoperative Pain Signatures with Symbolic Aggregate Approximations." *The Clinical Journal of Pain* 33, no. 1 (2017): 1.
- 32. Thottakkara, Paul, Tezcan Ozrazgat-Baslanti, Bradley B. Hupf, Parisa Rashidi, Panos Pardalos, Petar Momcilovic, and Azra Bihorac. "Application of Machine Learning Techniques to High-Dimensional Clinical Data to Forecast Postoperative Complications." PLOS One 11, no. 5 (2016): e0155705.

€ Among the top 10% most cited PLOS ONE authors of 2016.

- Tighe, Patrick J., Matthew Bzdega, Roger B. Fillingim, Parisa Rashidi, and Haldun Aytug. "Markov Chain Evaluation of Acute Postoperative Pain Transition States." *Pain* 157, no. 3 (2016): 717.
- Wanigatunga, Amal A., Paul V. Nickerson, Todd M. Manini, and <u>Parisa Rashidi</u>. "Using Symbolic Aggregate Approximation (SAX) to Visualize Activity Transitions Among Older Adults." *Physiological Measurement* 37, no. 11 (2016): 1981.
- 35. Stephen D Anton, Adam J Woods, Tetso Ashizawa, Diana Barb, Thomas W Buford, Christy S Carter, David J Clark, Ronald A Cohen, Duane B Corbett, Yenisel Cruz-Almeida, Vonetta Dotson, Natalie Ebner, Philip A Efron, Roger B Fillingim, Thomas C Foster, David M Gundermann, Anna-Maria Joseph, Christy Karabetian, Christiaan Leeuwenburgh, Todd M Manini, Michael Marsiske, Robert T Mankowski, Heather L Mutchie, Michael G Perri, Sanjay Ranka, **Parisa Rashidi**, Bhanuprasad Sandesara, Philip J Scarpace, Kimberly T Sibille, Laurence M Solberg, Shinichi Someya, Connie Uphold, Stephanie Wohlgemuth, Samuel Shangwu Wu, and Marco Pahor. "Successful Aging: Advancing the Science of Physical Independence in Older Adults." *Ageing Research Reviews* 24 (2015): 304-327.
- 36. Mohr, David C., Stephen M. Schueller, Enid Montague, Michelle Nicole Burns, and <u>Parisa</u> <u>Rashidi</u>. "The Behavioral Intervention Technology Model: An Integrated Conceptual and Technological Framework For eHealth and mHealth Interventions." *Journal of Medical Internet Research* 16, no. 6 (2014): e146.
 - ★ Impact Factor: 4.6, Citation Count: 190+, In the top 5% of all research outputs scored by Altmetric.
- 37. **<u>Rashidi, Parisa</u>**, and Alex Mihailidis. "A Survey on Ambient-Assisted Living Tools for Older Adults." *IEEE Journal of Biomedical Aand Health Informatics* 17, no. 3 (2013): 579-590.
 - ★ Citation Count: 660+, 6000+ Downloads, Among the Top 50 IEEE JBHI Papers of All Time, Cited by the European Union (EU) Policy Document on Ethical aspects of Cyber-Physical

Systems.

- <u>Rashidi, Parisa</u>, and Diane J. Cook. "COM: A Method for Mining and Monitoring Human Activity Patterns in Home-Based Health Monitoring Systems." *Association for Computing Machinery (ACM) Transactions on Intelligent Systems and Technology (TIST)* 4, no. 4 (2013): 64.
 - ★ 5-year Impact Factor: 10.4, Ranked No.1 in all ACM journals in terms of avg. citations per paper.
- 40. Cook, Diane J., Narayanan C. Krishnan, and <u>Parisa Rashidi</u>. "Activity Discovery and Activity Recognition: A New Partnership." *IEEE Transactions on Cybernetics* 43, no. 3 (2013): 820-828.
 - ★ Impact Factor: 8.8, Citation Count: 170+, 1600+ Downloads.
- 41. Chen, Liming, and <u>Parisa Rashidi</u>. "Situation, Activity and Goal Awareness in Ubiquitous Computing." *International Journal of Pervasive Computing and Communications* 8, no. 3 (2012): 216-224.
- 42. <u>Rashidi, Parisa</u>, Diane J. Cook, Lawrence B. Holder, and Maureen Schmitter-Edgecombe. "Discovering Activities to Recognize and Track in A Smart Environment." *IEEE Transactions on Knowledge and Data Engineering* 23, no. 4 (2011): 527-539.
 ★ Citation Count: 410+, 8 Patent Citations, 3300+ Downloads.
- 43. <u>Rashidi, Parisa</u>, and Diane J. Cook. "Activity Knowledge Transfer in Smart Environments." *Pervasive and Mobile Computing* 7, no. 3 (2011): 331-343.
- 44. **<u>Rashidi, Parisa</u>**, and Diane J. Cook. "Keeping the Resident in the Loop: Adapting the Smart Home to the User." *IEEE Trans. Systems, Man, and Cybernetics, Part A* 39, no. 5 (2009): 949-959.
 - ★ Citation Count: 370+, 11 Patent Citations, 2800+ Downloads, Top #50 Top IEEE TSMC Articles of All Time.

Preprint Manuscripts

- 1. Ong, Triton, Matthew Ruppert, **Parisa Rashidi**, Tezcan Ozrazgat-Baslanti, Marko Suvajdzic, and Azra Bihorac. "The DREAMS Project: Improving the Intensive Care Patient Experience with Virtual Reality." *arXiv preprint arXiv*:1906.11706 (2019).
- Shickel, Benjamin, Scott Siegel, Martin Heesacker, Sherry Benton, and <u>Parisa Rashidi</u>. "Automatic Detection and Classification of Cognitive Distortions in Mental Health Text." *arXiv* preprint arXiv:1909.07502 (2019).

- Ebadi, Ashkan, Patrick J. Tighe, Lei Zhang, and <u>Parisa Rashidi</u>. "Does the Position of Surgical Service Providers in Intra-Operative Networks Matter? Analyzing the Impact of Influencing Factors on Patients' Outcome." *arXiv preprint arXiv*:1812.07129 (2018).
- 4. Adhikari, Lasith, Tezcan Ozrazgat-Baslanti, Paul Thottakkara, Ashkan Ebadi, Amir Motaei, **Parisa Rashidi**, Xiaolin Li, and Azra Bihorac. "Improved Predictive Models for Acute Kidney Injury with IDEAs: Intraoperative Data Embedded Analytics." *arXiv preprint arXiv*:1805.05452 (2018).
- Davoudi, Anis, Kumar Rohit Malhotra, Benjamin Shickel, Scott Siegel, Seth Williams, Matthew Ruppert, Emel Bihorac, Tezcan Ozrazgat-Baslanti, Patrick J. Tighe, Azra Bihorac, and <u>Parisa</u> <u>Rashidi</u>. "The Intelligent ICU Pilot Study: Using Artificial Intelligence Technology for Autonomous Patient Monitoring." arXiv preprint arXiv:1804.10201 (2018).
 - ❀ In the top 5% of all research outputs scored by Altmetric, Highlighted in NVIDIA News. Published in Nature Scientific Reports in May 2019.

Conference Proceeding Papers

- 1. Shickel, Benjamin, Martin Heesacker, Sherry Benton, and <u>Parisa Rashidi</u>. "Automated Emotional Valence Prediction in Mental Health Text via Deep Transfer Learning." In the Proceedings of the 20th annual IEEE International Conference on Bioinformatics and Bioengineering (IEEE BIBE). Online, October 2020.
- 2. Shickel, Benjamin, Scott Siegel, Martin Heesacker, Sherry Benton, and Parisa Rashidi. "Automatic Detection and Classification of Cognitive Distortions in Mental Health Text." In the Proceedings of the 20th annual IEEE International Conference on Bioinformatics and Bioengineering (IEEE BIBE). Online, October 2020.
- Davoudi, Anis, Catherine Dion, Shawna Amini, David Libon, Patrick Tighe, Catherine Price, and <u>Parisa Rashidi</u>. "Phenotyping Cognitive Impairment using Graphomotor and Latency Features in Digital Clock Drawing Test". In Proceedings of the 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC). Montréal, Québec, Canada, July 2020.
- 4. Davoudi, Anis, Tezcan Ozrazgat-Baslanti, Patrick Tighe, Azra Bihorac, and <u>Parisa Rashidi</u>. "Pain and Physical Activity Association in Critically III Patients". In Proceedings of the 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Montréal, Québec, Canada, July 2020.
- Demrozi, Florenc, Graziano Pravadelli, Patrick Tighe, Azra Bihorac, and <u>Parisa Rashidi</u>. "Joint Distribution and Transitions of Pain and Activity in Critically III Patients". In Proceedings of the 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Montréal, Québec, Canada, July 2020.
- 6. Iyengar, Vasundhra, Azra Bihorac, and <u>Parisa Rashidi</u>. "Automated Detection of Rest Disruptions in Critically III Patients". In Proceedings of the 42nd Annual International

Conference of the IEEE Engineering in Medicine and Biology Society (EMBC). Montréal, Québec, Canada, July 2020.

- Alpert, Jordan, Satya Prabhaka Kota Naga, Tonati Mendoza Viramontes, Laurence Solberg, Todd Manini, and <u>Parisa Rashidi</u>. "Incorporating patient-generated smartwatch data into the EHR". In Proceedings of the *International Conference on Communication in Healthcare* (*ICCH*), 27-30. San Diego, CA, USA, 2019.
- 8. Suvajdzic, Marko, Azra Bihorac, **Parisa Rashidi**, Matthew Ruppert, Seth Williams, Triton Ong and Tezcan Ozrazgat-Baslanti. "Developing a Patient-Centered Virtual Reality Healthcare System to Prevent the Onset of Delirium in ICU Patients." In *Proceedings of the IEEE International Conference on Serious Games and Applications for Health (SeGAH)*, 150-156. Kyoto, Japan, 2019.
- 9. Malhotra, Rohit, Kumar, Anis Davoudi, Scott Siegel, Azra Bihorac, and <u>Parisa Rashidi</u>. "Autonomous Detection of Disruptions in the Intensive Care Unit Using Deep Mask R-CNN." In *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* Workshops, 1863-1865. Salt Lake City, UT, USA, 2018.
- 10. Nickerson, Paul, Raheleh Baharloo, Anis Davoudi, Azra Bihorac, and <u>Parisa Rashidi</u>. "Comparison of Gaussian Processes Methods to Linear methods for Imputation of Sparse Physiological Time Series". *In Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 4106-4109. Honolulu, HI, USA, 2018.
- 11. Davoudi, Anis, Duane B. Corbett, Tezcan Ozrazgat-Baslanti, Azra Bihorac, Scott C. Brakenridge, Todd M. Manini, and **Parisa Rashidi**. "Activity and Circadian Rhythm of Sepsis Patients in the Intensive Care Unit". *In Proceedings of the IEEE Biomedical and Health Informatics (BHI)*, 17-20. Las Vegas, NV, USA, 2018.
- 12. Shruthi Gopalswamy, Patrick J. Tighe, and **Parisa Rashidi**. "Deep Recurrent Neural Networks for Predicting Intraoperative and Postoperative Outcomes and Trends". *In Proceedings of the IEEE International Conference on Biomedical and Health Informatics (BHI)*, 568-573. Orlando, FL, USA, 2017.
- 13. Davoudi, Anis, Tezcan Ozrazgat-Baslanti, Ashkan Ebadi, Alberto C. Bursian, Azra Bihorac, and <u>Parisa Rashidi</u>. "Delirium Prediction using Machine Learning Models on Predictive Electronic Health Records Data". *In Proceedings of the IEEE International Conference on Bioinformatics and Bioengineering (BIBE)*, 568-573. Washington, DC, USA, 2017.
- Kheirkhahan, Matin, Hiranava Das, Manoj Battula, Anis Davoudi, Parisa Rashidi, Todd M. Manini, and Sanjay Ranka. "Power-Efficient Real-Time Wear and Non-Wear Time Detection Method for Smartwatches". In Proceedings of the IEEE International Conference on Biomedical and Health Informatics (BHI), 217-220. Orlando, FL, USA, 2017.
- 15. Suvajdzic, Marko, **Parisa Rashidi**, and Azra Bihorac. "D.R.E.A.M.S. (Digital Rehabilitation Environment-Altering Medical System)". *In Proceedings of the IEEE 5th International Conference on Serious Games and Applications for Health (SeGAH)*, 1-5. Perth, Western Australia, 2017.

- 16. Shickel, Benjamin, and <u>Parisa Rashidi</u>. "ART: An Availability-Aware Active Learning Framework for Data Streams". *In Proceedings of the International Florida Artificial Intelligence Research Society Conference (FLAIRS)*, 92-97. Key Largo, FL, USA, 2016.
- Nickerson, Paul, Patrick Tighe, Benjamin Shickel, and <u>Parisa Rashidi</u>. "Deep neural network architectures for forecasting analgesic response." *In Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2966-2969. Orlando, FL, USA, 2016.
- 18. Ebadi, Ashkan, Patrick Tighe, Lei Zheng, and <u>Parisa Rashidi</u>. "On the Scale-Free Characteristics of Surgical Team Networks". *In Proceedings of the International Conference on Collaboration Network (COLLNET)*, 1-11. Nancy, France. 2016.
- 19. Nair, Sanjay, Matin Kheirkhahan, Anis Davoudi, **Parisa Rashidi**, Amal A. Wanigatunga, Duane B. Corbett, Todd M. Manini, and Sanjay Ranka. "ROAMM: A software infrastructure for real-time monitoring of personal health." *In Proceedings of the IEEE International Conference on e-Health Networking, Applications and Services (Healthcom)*, 1-6. Munich, Germany, 2016.
- 20. Shickel, Benjamin, Martin Heesacker, Sherry Benton, Ashkan Ebadi, Paul Nickerson, and <u>Parisa Rashidi</u>. "Self-Reflective Sentiment Analysis." In Proceedings of the Computational Linguistics and Clinical Psychology Workshop (CLPsych), Conference of the North American Chapter of the Association for Computational Linguistics – Human Language Technologies (NAACL HLT), 23-32. San Diego, CA, USA, 2016.
- Shickel, Benjamin, and <u>Parisa Rashidi</u>. "Automatic Triage of Mental Health Forum Posts". In Proceedings of the Computational Linguistics and Clinical Psychology Workshop (CLPsych), Conference of the North American Chapter of the Association for Computational Linguistics – Human Language Technologies (NAACL HLT), Shared Task, 188-192. San Diego, CA, USA, 2016.
- 22. <u>Rashidi, Parisa</u>. "Assisted Living Technologies for Older Adults". *In Proceedings of the ACM International Health Informatics Symposium (IHI)*, 875–878. Miami, FL, USA, 2012.
- 23. <u>Rashidi, Parisa</u>, and Diane J. Cook. "Ask me better questions: active learning queries based on rule induction." *In Proceedings of the International Conference on Knowledge Discovery and Data Mining (KDD)*, 904-912. San Diego, CA, USA, 2011.
- 24. <u>Rashidi, Parisa</u>, and Diane J. Cook. "Domain selection and adaptation in smart homes." *In Proceedings of the International Conference on Smart Homes and Health Telematics (ICOST)*, 17-24. Montreal, Canada, 2011.
- 25. Nazerfard, Ehsan, **Parisa Rashidi**, and Diane J. Cook. "Using association rule mining to discover temporal relations of daily activities." *In Proceedings of the International Conference on Smart Homes and Health Telematics (ICOST)*, 49-56. Montreal, Canada, 2011.

- 26. **Rashidi, Parisa**, and Diane J. Cook. "Mining sensor streams for discovering human activity patterns over time." *In Proceedings of the IEEE International Conference on Data Mining (ICDM)*, 431-440. Sydney, Australia, 2010.
- 27. <u>Rashidi, Parisa</u>, and Diane J. Cook. "Mining and monitoring patterns of daily routines for assisted living in real world settings." *In Proceedings of the ACM International Health Informatics Symposium*, 336-345. Arlington, VA, USA, 2010.
- <u>Rashidi, Parisa</u>, and Diane J. Cook. "Multi home transfer learning for resident activity discovery and recognition." *In Proceedings of the International Conference on Knowledge Discovery and Data Mining (KDD) Workshop on Knowledge Discovery from Sensor Data*, 56-63. Washington, DC, USA, 2010.
- 29. **Rashidi, Parisa**, and Diane J. Cook. "Activity recognition based on home to home transfer learning." In *Proceedings of the Workshops at AAAI Conference on Artificial Intelligence*, 45-52. Atlanta, GA, USA, 2010.
- Nazerfard, Ehsan, Parisa Rashidi, and Diane J. Cook. "Discovering Temporal Features and Relations of Activity Patterns." In *Proceedings of the IEEE International Conference on Data Mining (ICDM) Workshops*, 1069-1075. Sydney, Australia, 2010.
- 31. <u>Rashidi, Parisa</u>, and Diane J. Cook. "Transferring Learned Activities in Smart Environments." In *Proceedings of the Intelligent Environments (IE)*, 185-192. Barcelona, Spain, 2009.
- <u>Rashidi, Parisa</u>, and Diane J. Cook. "Keeping the intelligent environment resident in the loop". In *Proceedings of the International Conference on Intelligent Environments (IE)*, 45– 54. Seattle, WA, USA, 2008.
- 33. Habib Karbasian and <u>Parisa Rashidi</u>. "PBT: Persian Part of Speech Brill Tagger". *In Proceedings of the International Conference Applied Computing (IADIS)*, 348–352. Amsterdam, the Netherlands, 2008.
- 34. <u>Rashidi, Parisa</u>, and Diane J. Cook. "An adaptive sensor mining framework for pervasive computing applications." In *Proceedings of the International Workshop on Knowledge Discovery from Sensor Data*, 154-174. Las Vegas, NV, USA, 2008.
- 35. <u>Rashidi, Parisa</u>, and Diane J. Cook. "Adapting to resident preferences in smart environments." In *Proceedings of the Conference on Artificial Intelligence (AAAI) Workshop on Preference Handling*, 78-84. Chicago, IL, USA, 2008.

Book Chapters

 Acampora, Giovanni, Diane J. Cook, <u>Parisa Rashidi</u>, and Athanasios V. Vasilakos, "Data Analytics for Pervasive Health". In *Healthcare Data Analytics*, edited by Chandan K. Reddy, Charu C. Aggarwal, 533-576. Boca Raton, FL: Chapman and Hall/CRC Press, 2015. *[authors equally*]

contributed, listed alphabetically]

- <u>Rashidi, Parisa</u>, "Stream sequence mining for human activity discovery". In *Plan, Activity, and Intent Recognition*, edited by Gita Sukthankar, Christopher Geib, Hung Hai Bui, David Pynadath, and Robert Goldman, 123-148. Burlington, MA: Morgan Kaufmann, 2014.
- <u>Rashidi, Parisa</u>, Narayanan C. Krishnan, and Diane J. Cook, "Discovering and Tracking Patterns of Interest in Security Sensor Streams". In *Securing Cyber-Physical Critical Infrastructure*, edited by Sajal Das, Krishna Kant, and Nan Zhang, 481-504. Burlington, MA: Morgan Kaufmann, 2012.
- <u>Rashidi, Parisa</u>, G. Michael Youngblood, Diane J. Cook, and Sajal K. Das, "Inhabitant Guidance of Smart Environments." In *Human-Computer Interaction. Interaction Platforms and Techniques*, edited by Julie A. Jacko, 910-919. Berlin, Heidelberg: Springer, 2007.
- <u>Rashidi, Parisa</u>, and Diane J. Cook. "An Adaptive Sensor Mining Framework for Pervasive Computing Applications." In *Knowledge Discovery from Sensor Data*, edited by Mohamed Medhat Gaber, Ranga Raju Vatsavai, Olufemi A. Omitaomu, João Gama, Nitesh V. Chawla, Auroop R. Ganguly, 154-174. Springer, Berlin, Heidelberg: Springer, 2008.

Editorial Report

- 1. Roy, Nirmalya, **Parisa Rashidi**, Lawrence Holder, and Liming Chen. "Special Issue on Data Mining in Pervasive Environments". *Pervasive and Mobile Computing*, 15, (2014): 151-152.
- Ghasemzadeh, Hassan, Diane Cook, Misha Pavel, Parisa Rashidi, Roozbeh Jafari, Marjorie Skubic, Michael Ong, and George Demiris. "SmartHealthSys 2014: ACM ubicomp international workshop on smart health systems and applications". *In Proceedings of the ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp)*, pp. 1179-1185. Budapest, Hungary, 2014.
- Dogan, Rezarta Islamaj, Yolanda Gil, Haym Hirsh, Narayanan C. Krishnan, Michael Lewis, Cetin Mericli, Parisa Rashidi, Victor Raskin, Samarth Swarup, Wei Sun, Julia M. Taylor, and Lana Yeganova. "Reports on the 2012 AAAI Fall Symposium Series". *AI Magazine*, 34, no. 1 (2012): 93-100.
- <u>Rashidi, Parisa</u>, Liming Chen, and William K. Cheung. "International Workshop on Situation, Activity and Goal Awareness (SAGAware 2012)". *In Proceedings of the 2012 ACM Conference on Ubiquitous Computing (UbiComp)*, pp. 1012-1015. Pittsburgh, PA, USA, 2012.
- Chen, Liming, Parisa Rashidi, Ismail Khalil, Zhiwen Yu, Christian Becker, and William K. Cheung. "Workshop overview for the international workshop on situation, activity and goal awareness". *In Proceedings of the International Conference on Ubiquitous Computing*, pp. 631-632. Beijing, China, 2011.

Conference Abstracts

- Shickel, Benjamin, Anis Davoudi, Tezcan Ozrazgat-Baslanti, Matthew Ruppert, Azra Bihorac, <u>Parisa Rashidi</u>. "Deep Multi-Modal Transfer Learning for Augmented Outcome Prediction In The Intelligent ICU." *Biomedical Engineering Society (BMES) Annual Meeting*. Online, October 2020.
- Bandyopadhyay, Sabyasachi, Tyler Loftus, Tezcan Ozrazgat-Baslanti, Ying-Chih Peng, Larysa Sautina, Maria-Cecilia Lopez, Henry Baker, Mark Segal, Azra Bihorac, <u>Parisa Rashidi</u>. "Machine Learning on Urinary Cellular Gene Expression Can Discriminate Sepsis From SIRS." *Biomedical Engineering Society (BMES) Annual Meeting*. Online, October 2020.
- 3. Davoudi, Anis, Catherine Dion, Erin Formanski, Shawna Amini, Patrick Tighe, **Parisa Rashidi**, Catherine Price. "Operationalizing Normal Appearing Digital Clock Drawing Among Older Adults." *Biomedical Engineering Society (BMES) Annual Meeting*. Online, October 2020.
- Loftus, Tyler, Shounak Datta, Matthew M Ruppert, Ziyuan Guan, Gloria Lipori, Chris Giordano, Gilbert R. Upchurch Jr., Parisa Rashidi, Tezcan Ozrazgat-Baslanti, and Azra Bihorac. "Artificial Intelligence for Predicting Complications with Live-Streaming Data: Prospective MySurgeryRisk Validation." *Clinical Congress*, Chicago, IL, October 2020.
- 5. Loftus, Tyler, Shounak Datta, Tezcan Ozrazgat-Baslanti, Matthew M Ruppert, Scott C Brakenridge, Alicia M Mohr, Philip Efron, Gilbert R. Upchurch Jr., Parisa Rashidi, and Azra Bihorac. "Added Value of Intraoperative Data for Predicting Postoperative Complications." 15th Annual Academic Surgical Congress, Orlando, FL, February 2020.
- Davoudi, Anis, Kumar Rohit Malhotra, Benjamin Shickel, Scott Siegel, Seth Williams, Matthew Ruppert, Emel Bihorac, Tezcan Ozrazgat-Baslanti, Patrick J. Tighe, Azra Bihorac, and <u>Parisa</u> <u>Rashidi</u>. "Intelligent ICU for Autonomous Patient Monitoring Using Pervasive Sensing and Deep Learning." *Frontiers of AI-Assisted Care Scientific Symposium*. Stanford, CA, September 2019.
- Shickel, Benjamin, Tyler J. Loftus, Lasith Adhikari, Tezcan Ozrazgat-Baslanti, Azra Bihorac, and <u>Parisa Rashidi</u>." DeepSOFA: Clinical Deep Learning for Real-Time Acuity Assessments of Critically III ICU Patients." *Frontiers of AI-Assisted Care Scientific Symposium*. Stanford, CA, September 2019.
- 8. Mardini, Mamoun T., Subhash Nerella, Dottington M. Fullwood, Duane B. Corbett, Sanjay Ranka, **Parisa Rashidi**, and Todd M. Manini. "Excursion from Home and Ecological Pain in Older Adults with Knee Pain." *Gerontological Society of America Annual Scientific Meeting (GSA)*. Austin, Texas, US, November 2019.
- Davoudi, Anis, Benjamin Shickel, Kumar Malhotra, Catharine Price, Patrick Tighe and <u>Parisa</u> <u>Rashidi</u>. "Deep Learning in Processing Clock Drawing Tests." *Biomedical Engineering Society* (*BMES*) Annual Meeting. Atlanta, GA, US, October 2018.
- Bandyopadhyay, Sabyasachi, Nicholas Lysak, Lasith Adhikari, Tezcan Baslanti, Larysa Sautina, Maria-Cecilia Lopez, Mark Segal, Henry Baker, Azra Bihorac and <u>Parisa Rashidi</u>. "Machine Learning Based Discovery of Urinary Biomarkers of Sepsis." *Biomedical Engineering Society*
(BMES) Annual Meeting. Atlanta, GA, US, October 2018.

- 11. Evelev, Natalie, Kumar Rohit Malhotra, Anis Davoudi, Azra Bihorac, and <u>Parisa Rashidi</u>. Patient Recognition for Pervasive Monitoring of Patients in The Intensive Care Unit. *Biomedical Engineering Society (BMES) Annual Meeting*. Atlanta, GA, US, October 2018.
- 12. Jackson, Nicholas, Anis Davoudi, Azra Bihorac and <u>Parisa Rashidi</u>. "Analysis of Actigraphy Data for Classifying Delirium in the ICU." *Biomedical Engineering Society (BMES) Annual Meeting*. Atlanta, GA, US, October 2018.
- 13. York, Jacob, Anis Davoudi, Azra Bihorac and <u>Parisa Rashidi</u>. "Comparing Machine Learning Models for Diagnosis of Patient Delirium in The ICU Using Actigraphy Data." *Biomedical Engineering Society (BMES) Annual Meeting*. Atlanta, GA, USA, October 2018.
- 14. Manini, Todd M., Anis Davoudi, Matin Kheirkhahan, Duane Corbetta, Roger Fillingim, Sanjay Ranka, and <u>Parisa Rashidi</u>. "Connections between daily activity patterns and ecological momentary assessments of pain in older adults who report knee pain." *Gerontological Society of America (GSA)*, Boston, MA, US, November 2018.
- 15. Manini, Todd M., Anis Davoudi, Matin Kheirkhahan, Duane Corbetta, Roger Fillingim, Sanjay Ranka, and <u>Parisa Rashidi</u>. "Digging Deeper: Insights into Physical and Cognitive Health Using Novel Methods for Accelerometry and Function." *Gerontological Society of America (GSA)*, Boston, MA, US, November 2018.
- 16. Corbett, Duane, Anis Davoudi, Matin Kheirkhahan, Roger Fillingim, Sanjay Ranka, Parisa Rashidi, and Todd Manini. "Smartwatch-Based Ecological Momentary Assessment versus Questionnaire-Based Recall of Knee Pain among Older Adults." World Congress on Pain, Boston, MA, US, September 2018.
- Davoudi, Anis, Duane B. Corbett, Tezcan Ozrazgat-Baslanti, Azra Bihorac, Scott C. Brakenridge, Todd M. Manini, and <u>Parisa Rashidi</u>. "Sepsis Recovery Subtyping using Actigraphy Methods." *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Honolulu, HI, US, July 2018.
- Shickel, Benjamin, Patrick Tighe, and <u>Parisa Rashidi</u>. "What Would PubMed Write about Pain? Automated PubMed Abstract Text Generation using Seq2Seq-style Deep Learning Techniques Trained on 200k PubMed Pain Research Abstracts." *American Academy of Pain Medicine Annual Meeting*, Vancouver, BC, Canada, April 2018.
- Baharloo, Raheleh, Patrick Tighe, and <u>Parisa Rashidi</u>. "Postoperative Acute Pain as a Dynamical System: Lessons from Infinite Impulse Response Filter Modeling." *American Academy of Pain Medicine Annual Meeting*. Vancouver, BC, Canada, April 2018.
- Raheleh Baharloo, Patrick Tighe, and Parisa Rashidi. Making Waves for Postoperative Pain: Wavelet-Based Clustering of Acute Postoperative Pain Intensity and Modeling to Forecast Average Pain Scores at Postoperative Day 30. American Academy of Pain Medicine's 34th Annual Meeting. Vancouver, BC, Canada, April 2018.

- Benjamin Shickel, Tyler Loftus, Tezcan Ozrazgat Baslanti, Azra Bihorac, and <u>Parisa Rashidi</u>. Increasing SOFA Score Granularity with Deep Learning. Society of Critical Care Medicine Congress (SCCM), San Antonio, TX, US, February 2018.
- 22. Tighe, Patrick J, Zach Quicksall, Shruthi Gopalswamy, and <u>Parisa Rashidi</u>. "Moving Beyond Dose and Demand Counts: Development of a Novel PCA Analytical Software Toolbox." *The International Anesthesia Research Society (IARS) Annual Meeting*. Washington, DC., US, May 2017.
- 23. Simpson, David, Andrew Jin, Mizuki Miyatake, Parisa Rashidi, and Patrick Tighe. "What Makes It This, and Not That? Deep Learning Neural Networks for Characterization of Ultrasound-Guided Peripheral Nerve Blocks: Elementary Hyper-parameter Explorations of Pilot Anatomical Windows." Annual Regional Anesthesiology and Acute Pain Medicine Meeting (ASRA), San Francisco, CA, US, April 2017.
- 24. Siegel, Scott, Agyeiwaa Agyei, Anis Davoudi, Patrick Tighe, and <u>Parisa Rashidi</u>. "Intelligent Surgical Instrument Recognition System." *American Medical Informatics Association Annual Symposium (AMIA)*, Washington, DC, US, November 2017.
- 25. Adams, Kaitlyn, Kumar Malhorta, Scott Siegel, Anis Davoudi, Azra Bihorac, and <u>Parisa Rashidi</u>. "Pervasive Monitoring of Patients Activity in The Intensive Care Unit." *Biomedical Engineering Society Annual Meeting (BMES)*, Phoenix, AZ, US, October 2017.
- 26. Ebadi, Ashkan, Paul Thottakkara, Tezcan Ozrazgat-Baslanti, **Parisa Rashidi**, and Azra Bihorac. "Reclassification Improvement for Acute Kidney Injury Using Intraoperative Data." *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Orlando, FL, US, August 2016.
- 27. Shickel, Benjamin, **Parisa Rashidi**, Haldun Aytug, and Patrick Tighe. "Markov Decision Processes for Postoperative Acute Pain Decision Support." *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Orlando, FL, US, August 2016.
- Davoudi, Anis, Jacob Rubin, Matthew Ruppert, Patrick Tighe, Azra Bihorac, and <u>Parisa Rashidi</u>. "Detection of Delirium using Kinect Sensor and Accelerometer Data." *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Orlando, FL, US, August 2016.
- Davoudi, Anis, Sanjay Nair, Matin Kheirkhahan, Sanjay Ranka, Todd M. Manini, and <u>Parisa</u> <u>Rashidi.</u> "Validation of Accelerometer Data from Samsung Gear S Smartwatch." *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Orlando, FL, US, August 2016.
- 30. Pourafshar, Negiin, Tezcan Ozrazgat-Baslanti, Anis Davoudi, **Parisa Rashidi**, Mark Segal, and Azra Bihorac. "Cardiovascular Mortality after Major Surgery in Elderly." *American Society of Nephrology Meeting*, Chicago, IL, US, November 2016.
- 31. Shickel, Benjamin, Matthew Bzdega, Roger Fillingim, **Parisa Rashidi**, Haldun Aytug, and Patrick Tighe. "Measuring Policy Sensitivity under Uncertain Conditions and Debatable Outcomes....

Painful MDP's for Acute Pain Decision Support?" International Annual Conference on Production and Operations Management Society (POMS), Orlando, FL, US, May 2016. [Invited Talk]

- 32. Shickel, Benjamin, Gokul Maddali, and <u>Parisa Rashidi</u>. "Extracting Type Relevancy of Conversational Entities for Building a Communication Assistant Tool." *International Florida Artificial Intelligence Research Society Conference (FLAIRS)*, Hollywood, FL, US, May 2015.
- 33. Shickel, Benjamin and <u>Parisa Rashidi</u>. "Time-Sensitive Online Active Learning for Multiple-Oracle Data Stream Classification." *International Florida Artificial Intelligence Research Society Conference (FLAIRS)*, Hollywood, FL, US, May 2015.
 - 36. Nagaraju, Dushyanth Bookanakere, Josue Luiz Dalboni da Rocha, Ranganatha Sitaram, and <u>Parisa Rashidi</u>. "Classifying Alzheimer's disease Based on Complex Graph Measures and Machine Learning Techniques." *Real-time Functional Imaging and Neurofeedback Conference (rtFIN)*, Gainesville, FL, US, February 2015.
 - <u>Parisa Rashidi</u>. "Vision Paper: Lifelong Monitoring and Intervention." National Workshop on Computing Challenges in Future Mobile Health (mHealth) Systems and Applications, Washington, D.C., US, October 2014.
 - Tighe, Patrick, Paul Nickerson, Roger Fillingim, and <u>Parisa Rashidi</u>. "Preliminary Definitions of TEMporal POstoperative pain Signatures via Symbolic Aggregate approximation." *National Institute of Health (NIH) Forum on Pain Research*, Washington, D.C., US, May 2014.

Internal Abstracts & Posters

- 1. Davoudi, Anis, Duane Corbett, Tezcan Ozrazgat-Baslanti, Azra Bihorac, Scott Brakenridge, Todd Manini, and <u>Parisa Rashidi</u>. "Activity and Circadian Rhythm of Sepsis Patients in the Intensive Care Unit." *Celebration of Research, University of Florida,* Gainesville, FL, US, 2018.
- 2. Bandyopadhyay, Sabyasachi, Azra Bihorac, and <u>Parisa Rashidi</u>. "Machine Learning on Urinary Gene Expression to predict Sepsis in Patients." *Pruitt Research Day Celebration, University of Florida,* Gainesville, FL, US, November 2017.
- 3. Shickel, Benjamin, Azra Bihorac, and <u>Parisa Rashidi</u>. "Deep SOFA: Development and Validation of a Novel Acuity Score Framework Using Deep Learning." *Pruitt Research Day Celebration*, *University of Florida*, Gainesville, FL, US, November 2017.
- 4. Davoudi, Anis, Azra Bihorac, and <u>Parisa Rashidi</u>. "Intelligent ICU for Autonomous Patient Assessment." *Pruitt Research Day Celebration, University of Florida,* Gainesville, FL, US, November 2017.
- Davoudi, Anis, Matin Kheirkhahan, Sanjay Nair, Sanjay Ranka, Todd Manini, and <u>Parisa Rashidi</u>.
 "Validation of Samsung Gear S Smartwatch in Actigraphy and Energy Expenditure Estimation." *College of Medicine Celebration of Research, University of Florida,* Gainesville, FL, US, 2017.

- 6. Liu, Weier, Ashkan Ebadi, Lei Zhang, **Parisa Rashidi**, and Patrick Tighe. "Social Network Analysis of Intraoperative Teams and Perioperative Outcomes." *College of Medicine Celebration of Research, University of Florida,* Gainesville, FL, US, 2017.
- 7. Simpson, David, Andrew Jin, Mizuki Miyatake, **Parisa Rashidi**, and Patrick Tighe. "Convolutional Neural Network Approaches to Preliminary Classification of Ultrasound-Guided Regional Anesthetic Target Regions." *College of Medicine Celebration of Research, University of Florida*, Gainesville, FL, US, 2017.
- 8. Khorram, Tina, Paul Thottakkara, Ashkan Ebadi, Tezcan Ozrazgat-Baslanti, Anis Davoudi, **Parisa Rashidi**, and Azra Bihorac. "Application of Machine Learning Techniques to High-Dimensional Clinical Data to Predict Risk for Postoperative Complications." *College of Medicine Celebration of Research, University of Florida,* Gainesville, FL, US, 2016.
- 9. Ebadi, Ashkan, Anis Davoudi, Paul Thottakkara, Tezcan Ozrazgat-Baslanti, **Parisa Rashidi**, and Azra Bihorac. "GATOR Kidney Risk Score." *College of Medicine Celebration of Research*, *University of Florida*, Gainesville, FL, US, 2016.
- 10. Manini, Todd, **Parisa Rashidi**, Sanjay Nair, and Sanjay Ranka. "Real-Time Online Activity and Mobility Monitoring (ROAMM) Through Wearable Technology." *Annual Pepper Center Conference, University of Florida,* Gainesville, FL, US, 2015.
- 11. Nickerson, Paul, Ben Shickel, Patrick Tighe, and <u>Parisa Rashidi</u>. "Deep Learning for Post-Operative Pain Management." *Pruitt Research Day Celebration, University of Florida,* Gainesville, FL, US, 2015.
- Shickel, Ben, and <u>Parisa Rashidi</u>. "Automatic Identification and Classification of Cognitive Distortions in Text." *Pruitt Research Day Celebration, University of Florida,* Gainesville, FL, US, 2015.
- 13. Kheirkhahan, Matin, **Parisa Rashidi**, Sanjay Ranka, and Todd M. Manini. "Finding Activity Patterns among Participants with Different Mobility Characteristic using Bag-of-Words Approach." *Spotlight on Aging, University of Florida,* Gainesville, FL, US, 2015.
- 14. Davoudi, Anis, Matin Kheirkhahan, Sanjay Ranka, Todd M. Manini, and <u>Parisa Rashidi</u>. "Validation of Accelerometer Data from Samsung Gear S Smart Watch." *Spotlight on Aging*, *University of Florida*, Gainesville, FL, US, 2015.
- Wanigatunga, Amal Asiri, Paul Nickerson, Todd M. Manini, and <u>Parisa Rashidi</u>. "Examining Symbolic Aggregate approXimation (SAX) Adaptive Accelerometry Cut-Points Among US Older Adults." *Spotlight on Aging, University of Florida,* Gainesville, FL, US, 2015.
- 16. Kheirkhahan, Matin, **Parisa Rashidi**, Sanjay Ranka, and Todd M. Manini. "Analysis of Mobility and Cognition Function in Older Adults from Actigraphy Data." *Aging Research Day, University of Florida,* Gainesville, FL, US, 2014.
- 17. Bhaskaran, Jagadeesh Radhakrishnan, Ishani Parikh, Matin Kheirkhahan, Sanjay Ranka, Adam Woods, Todd M. Manini, and **Parisa Rashidi**. "Identifying Older Adult Population Segments In

Terms Of Mobility And Cognitive Function Using Hierarchical Clustering." *Pruitt Research Day Celebration, University of Florida,* Gainesville, FL, US, 2014.

- Nickerson, Paul, Patrick Tighe, and <u>Parisa Rashidi</u>. "Mining Motifs in Vital Sign Time Series." BME Pruitt Research Day, *University of Florida*, Gainesville, FL, US, 2014. [Honorable Mention Poster Award]
- 19. Shickel, Benjamin, Gokul Maddali and <u>Parisa Rashidi</u>. "Extracting Type Relevancy of Conversational Entities for Building a Communication Assistant Tool." *Pruitt Research Day Celebration, University of Florida,* Gainesville, FL, US, 2014.

PATENTS

- Systems and Methods for Providing an Acuity Score for Critically III or Injured Patients. Azra Bihorac, Tyler J. Loftus, Tezcan Ozrazgat Baslanti, Parisa Rashidi, Benjamin P. Shickel. Pending Appl. No. 62/809,159, filed February 22, 2019 (*Pending*). The first real-time and continuous version of the commonly used Sequential Organ Failure Assessment (SOFA) score in the Intensive Care Unit (ICU).
- Rashidi, Parisa, Azra Bihorac, and Patrick J. Tighe. "Method and apparatus for pervasive patient monitoring." U.S. Patent Application 16/388,351, filed October 24, 2019. The first autonomous visual assessment system for monitoring critically ill patients in the Intensive Care Unit (ICU).
- Bihorac, Azra, Xiaolin Li, Parisa Rashidi, Panagote Pardalos, Tezcan Ozrazgat-baslanti, Wiliam Hogan, Daisy Zhe Wang, Petar Momcilovic, and Gloria Lipori. "Method and apparatus for prediction of complications after surgery." U.S. Patent Application 16/616,534, filed May 21, 2020. The first real-time system for predicting complications after surgery.
- Cook, Diane J., and Parisa Rashidi. "Systems and methods for adaptive smart environment automation." U.S. Patent Number. 8,880,378. 4, November 2014. First adaptive smart home system utilizing machine learning techniques to adapt to residents, cited 69 times.

AWARDED, SUMMARY	2013-2020	
Number of Grants/Awards Received:		17
Faculty Share:		\$3.05 M
Total Amount:		\$10.6M

GRANTS & AWARDS

AWARDED, DETAILS

---- Federal Grants ----

2019-2022 \$576,801 (Rashidi: \$576,801) National Institute of Health (NIH) TrailBlazer: Autonomous Pain Recognition in Non-Verbal and Critically Ill Patients The overall objective of this project is to build the foundation of an autonomous, clinicallyavailable pain assessment system by developing and validating pain recognition algorithms in a fully uncontrolled ICU setting. Rashidi (PI) Role: PI

2018-2023 \$595,029 (Rashidi: \$595,029) National Science Foundation (**NSF**) **CAREER:** Fundamental Intelligent Building Blocks of the Intensive Care Unit (ICU) of the Future

Project Goal: The major goals of this project are to develop machine learning models for patient monitoring in the critical care unit. Rashidi (PI) Role: PI

2015-2016\$225,000 (Rashidi: \$95,087)National Science Foundation (NSF)STTR Phase I: TAO: An Intelligent Mental Health Therapy Tool

Project Goal: The major goals of this project are to utilize the wealth of collected mental health data by online therapy tool TAO using novel natural language processing and machine learning techniques to provide highly personalized treatments to mental health patients. Rashidi (University PI), Benton (Private Partner PI) Role: PI

2016\$45,000 (Rashidi: \$32,010)National Science Foundation (NSF)BRIDGE Phase I to II: TAO: An Intelligent Mental Health Therapy ToolProject Goal: The major goals of this project are to further develop the natural language processing
techniques developed in Phase I using techniques such as word embedding and deep learning.
Rashidi (University PI), Benton (Private Partner PI)Role: PI

2016-2019\$750,000 (Rashidi: \$221,242)National Science Foundation (NSF)SBIR Phase II: An Intelligent Mental Health Therapy System

Project Goal: The major goals of this project are to further develop the natural language processing and machine learning techniques developed in Phase I.

Rashidi (University PI), Benton (Private Partner PI) Role: PI

2015-2020 \$3,231,529 (Rashidi: \$265,939) National Institute of Health (NIH) R01: Finding Good Temporal Postoperative Pain Signatures

Project Goal: This project examines how postoperative pain scores change with respect to time using machine learning and advanced data science techniques such as shapelets and deep learning techniques.

Rashidi (Co-I), Tighe (PI) Role: Co-I

2015-2018 \$665,000 (Rashidi: \$23,517)

National Institute of Health (NIH)

SBIR: PEAKS: Validation of Mobile Technologies for Clinical Assessment, Monitoring, and Intervention

This project examines how wearable accelerometers can be used for clinical assessment and monitoring.

Rashidi (Co-I), Albinali (PI) Role: Co-I

2016-2020\$2,286,618 (Rashidi: \$299,313)National Institute of Health (NIH)R01: Integrating data, algorithms and clinical reasoning for surgical risk assessmentProject Goal: This project examines how surgical risk can be assessed using machine learning and
advanced data analysis techniques.Rashidi (Co-I), Bihorac, Li (PI)Role: Co-I

2017-2022\$2,500,00 (Rashidi: \$750,000)National Institute of Health (NIH)R01: PRECEDE: PREsurgical Cognitive Evaluation via Digital clockfacE drawingProject Goal: This project examines how deep learning and digital technology can be used to assesscognitive function in hospitalized patients.Rashidi (Co-I), Tighe, Price (PI)Role: Co-I

2013-2018\$3,825,482 (Rashidi: \$127,985)National Institute of Health (NIH)R01: Artificial Intelligence in a Mobile Intervention Tool for DepressionProject Goal: This project aims to use machine learning techniques to provide just in timeintervention techniques for mental health patients.Rashidi (Co-I), Mohr (PI)Role: Co-I*Not transferred after moving to UF

----Workshop Grants ----

2013-2014\$15,000 (Rashidi: N/A)National Science Foundation (NSF)Workshop:Travel Fund for 2012 AAAI Fall Symposium on AI for GerontechnologyProject Goal:This workshop provided travel fund for approximately 10 early stage scholars,including graduate students and postdoctoral fellows.Rashidi (Co-PI), PI (Cook)Role:Co-PI

---- State Grants ----

 2015-2016
 \$124,556 (Rashidi: \$80,627)
 Florida High Tech Corridor Council

 FHTCC: Intelligent Mental Health Treatment Recommendation

Project Goal: The goal of this project is to automatically recommend treatments and interventions based on personalized patient profiles and their recovery trajectory. This is a matching grant on TAO Connect Inc. Industry support.

Rashidi (PI), Heesacker (co-I) Role: PI

---- Industry Support ----

2017 Deep Learning GPU Equipment (Rashidi) Industry: NVIDIA Corporation

Intelligent Health System Lab Support

Project Goal: The GPU equipment will be used to develop deep learning applications in the clinical domain.

Rashidi (PI)

Role: PI

2015-2016\$18,819 (Rashidi: \$7,269)Industry: TAO Connect, Inc.Matched: Intelligent Mental Health Treatment RecommendationProject Goal: The goal of this project is to automatically recommend treatments and interventionsbased on personalized patient profiles and their recovery trajectory.Rashidi (PI), Heesacker (co-I)Role: PI

---- Internal Grants ----

2015-2016\$30,777 (Rashidi: \$30,777)UF Informatics Institute (UFII)Automatic Real-Time Detection of Delirium in Intensive Care Units using Pattern RecognitionProject Goal: This project examines how delirium can be detected using machine learning andadvanced data analysis techniques.Rashidi (PI)Role: PI

2018-2019 \$56,247 (Rashidi: \$56,247) Clinical and Translational Science Institute (CTSI) Automated Integration of Patient-Generated Data with the Electronic Health Record Data Project Goal: This project aims to integrate electronic health record data with mHealth sensor data. Rashidi (PI) Role: PI

2016-2018\$24,109 (Rashidi: \$24,109)PRICE-CTSI-IOA PilotReal-Time Patient Reported Outcome of Pain in Community-dwelling Older AdultsProject Goal: This project aim is to provide an ecological momentary assessment (EMA) tool for
capturing patient reported outcome (PRO) in real time within daily life, using a smartwatch for
collecting pain intensity, fatigue level, and mood.
Rashidi (PI)Role: PI

2014-2015\$37,838 (Rashidi: no efforts allowed)UF Informatics Institute (UFII)Analysis of Actigraphy Patterns for Improved Physical Activity Intervention and PreventingMobility Incidents in Older AdultsProject Goal: The major goal of this project is to identify mobility impairment using high resolutionmovement data measured from accelerometer.Rashidi (Co-I), Manini (PI)Role: Co-I

TEACHING

Primary Instructor:

 Computer Applications For BME, BME 3053C Undergraduate Course, Department of Biomedical Engineering, Spring 2018, Fall 2019 (Co-teaching), Spring 2020 University of Florida

- Biomedical Data Science, BME4931/6938
 Graduate Course, Department of Biomedical Engineering, Spring 2017, Fall 2018, Fall 2019, Fall 2020
 University of Florida
- Machine Learning for Health and Biomedical Applications, BME4931/6938 Graduate Course, Department of Biomedical Engineering, Spring 2014, Fall 2015, Fall 2016 University of Florida
- Biomedical Informatics, BME4931/6938
 Undergraduate Course, Department of Biomedical Engineering, Spring 2016, Fall 2014
 University of Florida
- Programming Fundamentals for CIS Majors, COP 3502
 Undergraduate Course, Computer and Information Science and Engineering, Spring 2012
 University of Florida

Guest Lectures:

- Machine Learning Lecture Series Guest Lecture, CBITs, Spring 2013 Northwestern University
- Introduction to Biomedical Engineering, BME 1008 Guest Lecture, Department of Biomedical Engineering, Fall 2013, Spring 2014, Spring 2016, Spring 2018, Fall 2019 University of Florida
- Data Science: Large-scale Advanced Data Analysis, CIS 6930 / CIS4930 Guest Lecture, Computer and Information Science and Engineering, Spring 2012 University of Florida

PRESENTATIONS & INVITED TALKS

International, National, Regional

- Parisa Rashidi, Azra Bihorac. "Pervasive sensing in critical care." The 2020 International on Complex Acute Illness (ICCAI), September 2020. [Invited Talk, Panelist, Virtual due to COVID-19]
- Parisa Rashidi. "AI: Balancing Profit, Efficiency, and Patient Safety in the Operating Room and ICU." *The 2020 International Anesthesia Research Society Meeting*, San Francisco, CA, US, May 2020. [Invited Talk, Panelist, Canceled due to COVID-19]
- 3. **Parisa Rashidi**. "Machine Learning in Medicine: Where to Start, Were We Are Going." *The* 2020 International Anesthesia Research Society Meeting, San Francisco, CA, US, May 2020. [Invited Talk, Panelist, Canceled due to COVID-19]
- 4. **Parisa Rashidi**. "The dark Side of AI in Medicine." *Annual Meeting of the Society for Critical Care Medicine (SCCM)*, Orlando, FL, February 2020 [Invited Talk].
- 5. **Parisa Rashidi**. "Intelligent Patient Monitoring Systems in Critical Care Settings." *Mayo Clinic's Grand Informatics Rounds*, Rochester, MN, January 2020. [Invited Talk]
- 6. **Parisa Rashidi**. "Intelligent Critical Care Monitoring." *Symposium on Machine Learning in Science and Engineering*, Atlanta, GA, June 2019. [Invited Talk]
- 7. **Parisa Rashidi**. "Autonomous Pain Assessment in Critically Ill Patients." *Pain Symposium, National Institute of Health (NIH)*, Washington, DC, May 2019. [Invited Talk, Mitchel Max Award Finalist]
- 8. **Parisa Rashidi**. "Man vs. Machine or Man + Machine? Leveraging Machine Learning and AI to Improve Health Care." *The 2019 International Anesthesia Research Society Meeting.*, Montreal, Quebec, Canada, May 2019. [Invited Talk, Panelist]
- 9. **Parisa Rashidi**. "Intelligent Health Systems." *International Conference on Computational Biomedicine*, Gainesville, FL, US, February 2019. [Invited Talk]
- 10. Parisa Rashidi. "Autonomous Pain Recognition in Critically Ill Patients", Annual NIH Pain Consortium Symposium, Invited, Washington, DC, May 2019.
- 11. Parisa Rashidi. "Intelligent Patient Monitoring Systems. "*Rita Kobb Nursing Informatics Symposium*, Invited Talk, Gainesville, FL, February 2019. [Invited Talk]
- 12. **Parisa Rashidi**. "Deep Analysis of Messy Perioperative Data." *Annual Meeting of the Society for Technology in Anesthesia (STA)*, Invited Talk, Panelist, Miami, FL, US, January 2018. [Invited Talk, Panelist]
- 13. **Parisa Rashidi**. "Data Science for mHealth Technologies and Behavioral Measurement." 74th American Psychosomatic Society Annual Meeting, Denver, CO, US, March 2016. [Invited Talk]
- 14. Parisa Rashidi. Intelligent Health Systems, National Academy of Engineering, Frontiers of Engineering, Davis, CA, 2017.
- 15. Parisa Rashidi. "Intelligent Health Systems", *Daytona State University STEM Seminar Series*, Invited Talk, Daytona Beach, FL, February 2016.

- 16. Parisa Rashidi. "Lifelong Monitoring and Intervention." National Workshop on Computing Challenges in Future Mobile Health (mHealth) Systems and Applications, Washington, D.C., US, October 2014.
- 17. **Parisa Rashidi**. "Machine Learning for mHealth." *National Institute of Health (NIH)*, Washington, DC, December 2013. [Invited Lecture]
- 18. **Parisa Rashidi**. "Machine Learning for mHealth, mHealth Bootcamp." *National Collaborative on Childhood Obesity Research (NCCOR)*, Atlanta, GA, December 2013. [Invited Lecture]
- 19. **Parisa Rashidi**. "Machine Learning for mHealth." *National Institute of Health (NIH)*, Washington, DC, December 2012. [Invited Lecture]
- 20. **Parisa Rashidi**. "A Tutorial on Assisted Living Technologies for Older Adults." International Health Informatics Symposium (IHI), Miami, FL. January 2012.
- 21. Parisa Rashidi. "Machine Learning and Gerontechnology." Florida Institute for Human and Machine Cognition (IHMC), Pensacola, FL, July 2012.
- 22. Parisa Rashidi. "How Smart is Your Home?" University of Oregon, Department of Computer Science. Eugene, OR, March 2011.
- 23. **Parisa Rashidi**, and Diane J. Cook. "Mining and Monitoring Patterns of Daily Routines for Assisted Living in Real World Settings." *International Health Informatics Symposium (IHI)*, Washington, D.C., US, November 2010.
- 24. **Parisa Rashidi**, and Diane J. Cook. "Activity Recognition Based on Home to Home Transfer Learning." *Association for Artificial Intelligence (AAAI) Conference on Artificial Intelligence*, Atlanta, GA, US, July 2010.
- 25. Parisa Rashidi, and Diane J. Cook. "Multi Home Transfer Learning for Resident Activity Discovery and Recognition." *Conference on Knowledge Discovery and Data Mining (KDD)*, Washington, D.C., US, July 2010.
- 26. **Parisa Rashidi**, and Diane J. Cook. "An Adaptive Sensor Mining Model for Pervasive Computing Applications." *Conference on Knowledge Discovery and Data Mining (KDD)*, Las Vegas, NV, US, July 2010.

Local

- 1. **Parisa Rashidi**. "Artificial Intelligence & the Future of Work." Santa Fe College, Gainesville, FL, US, October 2020.
- 2. **Parisa Rashidi**. "A Smartwatch Framework for Assessing Patient Reported Outcomes." *Pain Research and Intervention Center of Excellence (PRICE), University of Florida*, Gainesville, FL, US, February 2018.

- 3. Parisa Rashidi. "Intelligent Health & Wellbeing Systems." Institute on Aging (IOA), University of Florida, Gainesville, FL, US, September 2014.
- 4. Parisa Rashidi. "Machine Learning for Smart Health." *Computer and Information Science and Engineering (CISE), University of Florid,* Gainesville, FL, US, February 2014.
- 5. **Parisa Rashidi**. "Intelligent Health & Wellbeing Systems." *Computational Neural Engineering Lab, Electrical and Computer Engineering (ECE), University of Florida,* Gainesville, FL, US, October 2013.
- 6. **Parisa Rashidi**. "Intelligent Health & Wellbeing Systems." *Clinical and Translational Science Institute (CTSI), University of Florida*, Gainesville, FL, US, October 2013.
- 7. Parisa Rashidi. "Intelligent Health & Wellbeing Systems." *Electrical and Computer Engineering (ECE), University of Florida*, Gainesville, FL, US, February 2014.
- 8. Parisa Rashidi. "Machine Learning for Assisted Living.", Cognitive Neurology and Alzheimer's Disease Center, Northwestern University, Chicago, IL December 2012.
- 9. Parisa Rashidi. "Ambient Assisted Living." Feinberg School of Medicine, Northwestern University, Chicago, IL, December 2011.

MENTORING

Junior Faculty

- Mamoun Mardini, Assistant Professor, Dept. of Aging and Geriatric Research
- Tyler J. Loftus, Assistant Professor, Department of Surgery

Postdoctoral Fellows

• Ashkan Ebadi, Ph.D., Machine Learning, 2015-2016

PhD Students

- 1. Ben Shickel, CISE, Physiological Time Series Analysis, 2014 Present
- 2. Anis Davoudi, BME, Intelligent ICU, 2015 Present
- 3. Raheleh Baharloo, ECE, Physiological Time Series Analysis, 2017 Present
- 4. Scott Siegel, BME, Quantum Machine Learning, 2017 Present
- 5. Sabyasachi Bandyopadhyay, BME, Integrated Data Analysis, 2017 Present
- 6. Subhash Nerella, BME, Critical Care Monitoring, 2018 Present

Master's Students (Alumni in Italics)

- 1. Rahul Radhakrishnan, Sketch Analysis, 2020
- 2. Parth Shah, Intelligent ICU, 2019
- 3. Anirudh Mukundan Raghavan, Intelligent ICU, 2019
- 4. Vasundhra Iyengar, CISE, Intelligent ICU, 2019
- 5. Suchak, Amish R, CISE, Intelligent ICU, 2018-2019
- 6. Ray, Swapnendu, ECE, Intelligent ICU, 2018-2019
- 7. Sannapaneni, Bharadwaj, CISE, Clinical Text Analysis, 2018-2019
- 8. Nitish Kumar Rath, CISE, Intelligent ICU, 2018-2019
- 9. Kumar R Malhotra, CISE, Activity Recognition in the ICU, 2017-2018
- 10. Subhash Nerella, Mech.E, Ultrasound Image Segmentation, 2018
- 11. Wan, Yongchen, CISE, Intelligent ICU, 2018
- 12. Mizuki Miyatake, BME, Deep Learning in Ultrasound Inference, 2016
- 13. Piyush Agade, CISE, Graph analysis, 2016
- 14. Karthik Maharajan Sankara Subramanian, CISE, Pain Recognition, 2016
- 15. Sritapa Dutta, CISE, Physiological Data Analysis, 2015
- 16. Dushyanth Bookanakere Nagaraju, CISE, Graph Analysis, 2014-2015
- 17. Jagadeesh Radhakrishnan Bhaskaran, mHealth, CISE, 2014-2015
- 18. Sudarsanan Janakiraman, Information System and Operation Management, 2014
- 19. Pankaj Narula, CISE, Machine Learning, 2013-2014
- 20. Sanchit Katdare, Mental Health Text Analysis, CISE, 2013-2014

Individual Study

- 1. Rahul Radhakrishnan, Sketch Analysis, 2020
- 2. Pulkit Tripathi, Clustering, 2019
- 3. Nitish Kumar Rath, Intelligent ICU, CISE, 2019
- 4. Aditya Nalluri, Deep Learning in Intraoperative Setting, CISE, 2018
- 5. Ajitesh Janaswamy, EHR DB, CISE, 2018
- 6. Srajan Paliwal, AKI Prediction Tool, CISE, 2018
- 7. Ghananeel S Rotithor, Assisted Communication Tool, BME, 2017
- 8. Venkata Trived, Pain Recognition Using Deep Learning, CISE, 2016
- 9. Rahul James Maliakkal, Anesthesia Equipment Recognition, CISE, 2016

- 10. Sunil Kumar, Mobile Facial Expression Recognition, CISE, 2016
- 11. Ambuj Kumar, Medical Literature Mining, Biology, 2016
- 12. Amal A. Wanigatunga, Epidemiology, Sensor Data Analysis, Health Sciences, 2015
- 13. Gokul Maddali, Named Entity Type Recognition, CISE, 2015
- 14. Siddardha Maddula, Mobile Facial Expression Recognition, CISE, 2015
- 15. Dushyanth Bookanakere Nagaraju, Graphs in Machine Learning, CISE, 2014
- 16. Jain Manish Geverchand, Audio Data Classification, CISE, 2014
- 17. Jagadeesh Radhakrishnan Bhaskaran, Sensor Data Analysis, CISE, 2014
- 18. Animita Roy, Sensor Data Analysis, ECE, 2014
- 19. Benjamine Shickel, Natural Language Processing in Mental Health, CISE, 2014
- 20. Namrata Bikhchandani, Natural language Features of Cognitive Distortions, CISE, 2014

Undergraduate Students (Alumni in Italics)

- 1. Kevin Miguel Vega Gonzalez, 2019-2020
- 2. Joseph Brooks, CISE, 2018-2019, University Scholar
- 3. Ria Bhaskar, BME, 2018-2020
- 4. Christie Nguyen, BME, 2017-2019, University Scholar
- 5. Natalie Evelev, BME, 2017-2019, University Scholar
- 6. Anthony Rodriguez, BME, 2018
- 7. Matthew Ruppert, BME, 2017-2018
- 8. Kaitlyn C Adams, BME, 2017
- 9. Gouthami Gadamsetty, BME, 2017
- 10. Alexander Hall, Senior, ECE, 2016
- 11. Paul Nickerson, BME, 2015
- 12. Zachary Quicksall, BME, Honorable mention, NSF Graduate fellowship Program, 2016

University Minority Mentor Program (UMMP)

- 1. Michele Wu, CISE, Freshman, 2016
- 2. Anthony Voong, CISE, Freshman, 2016
- 3. Abhisek Mishra, ECE, Freshman, 2015

Visiting Scholars

1. Sameh Triki, PhD Candidate, University of Toulous, France, Discovering Human Walking

Patterns, 2015

Student Science Training Program (SSTP)

- 1. Nicholas Jackson, Junior High school, Summer 2018
- 2. Jacob York, Junior High school, Summer 2018
- 3. Avaneesh R. Kunta, Junior High school, Summer 2016

THESIS & DISSERTATION COMMITTEES

Ph.D. Committee Chair

1.	Shickel,Benjamin P	CISE	Summer 2019
2.	Davoudi, Anis	BME	Spring 2020
3.	Raheleh Baharloo	ECE	Spring 2020
4.	Scott Siegel	BME	Spring 2020
5.	Sabyasachi Bandyopadhyay	BME	Spring 2020
6.	Subhash Nerella	BME	Spring 2023

Ph.D. Committee Member (Alumni in blue font)

1.	Kheirkhahan, Matin	CISE	Fall 2018
2.	Charbel,Marc W	BME	Spring 2018
3.	Liu, Fujun	ECE	Summer 2017
4.	Rajan, Abhijit	BME	Spring 2018
5.	Ravindran, Aniruddh	BME	Summer 2017
6.	Sapkota, Manish	ECE	Spring 2018
7.	Su, Hai	BME	Spring 2019
8.	Xie,Yuanpu Sr	BME	Spring 2018
9.	Shi, Xiaoshuang	BME	Fall 2019
10.	Chen, Pingjuin	ECE	Spring 2020
11.	Meyappan, Sreenivasan	BME	Spring 2019
12.	Xing,Fuyong	ECE	Spring 2018
13.	Abolfazl Mollalo	GEO	Spring 2019
14.	Sunil Kumar	CISE	Spring 2020
15.	Rozowsky, Jared M	BME	Spring 2021
16.	Peng Liu	BME	Spring 2021
17.	Farnaz Babaie Sarijaloo	ISE	Spring 2021
18.	Sarah Long	BME	TBD
19.	Ayse Demircan	BME	Spring 2022
20.	Kalyn Kearney	BME	TBD

International PhD Committee Member

1. Florenc Demrozi University of Verona, Italy S	Spring 2020
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MS Committee Chair

2.	Paul Nickerson	BME	Spring 2017
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MS Committee Member

1.	Wu,Shaoju	BME	Fall 2017
2.	Mcgough,Mason M	BME	Fall 2016

Honor thesis Committee

1.	Nicole Veit	BME, Fall 2020
2.	Brecca Miller	BME, Spring 2020
3.	Kyle B. See	BME, Spring 2019
4.	Skylar Stolte	BME, Spring 2019
5.	Anthony Calas	CISE Fall 2016

BME Supervisory Chair

- 1. Yangru Zhou
- 2. Megan Rahnama
- 3. Ibrahim Khaled Almuteb

Student & Fellow Awards

- 2019, Anis Davoudi, 2020 MCI Symposium Young Investigator Travel Scholarship
- 2019, Joseph Brooks, University Scholar
- 2018, Natalie Evelev, University Scholar
- 2018, Christie Nguyen, University Scholar
- 2018, Anis Davoudi, NSF Supported Women in Computer Vision Workshop, Conference on Computer Vision and Pattern Recognition (CVPR)
- 2018, Anis Davoudi, NSF Supported IEEE Biomedical and Health Informatics and Wearable and Implantable Body Sensor Networks Conference Student Travel Award
- 2017, Best Poster, College of Medicine Celebration of Research, Sabyasachi Bandyopadhyay
- 2016, Anis Davoudi, UF Informatics Institute Fellowship
- 2016, Zachary Quicksall, NSF Graduate Fellowship Honorable Mention
- 2016, Mizuki Miyatake, third place at BME photography contest, using deep learning
- 2014, Paul Nickerson, Honorable Mention Poster Award, BME Pruitt Research Day

WORKSHOP & SYMPOSIUM ORGANIZATION

2020	Sub-track Chair, The Annual Meeting of the Biomedical Engineering Society (BMES), Machine Learning in Biomedical Applications, San Diego, CA, US, 2020.
2017	Co-Chair, "Workshop on Machine Learning & Knowledge Extraction for Ambient Assisted Living", <i>International Cross-Domain Conference for Machine Learning and Knowledge Extraction</i> . Reggio Calabria, Italy, August 2017.
2015	Co-Chair, "Workshop on Data Mining and Decision Analytics for Public Health and Wellness", <i>IEEE International Conference on Data Mining (ICDM)</i> . Atlantic City, New Jersey, November 2015.
2014	Co-Chair, "Workshop on Smart Health Systems", ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp). Seattle, WA, September 2014.
2013	Co-Chair, "Symposium on Gerontechnology and AI", Association for the Advancement of Artificial Intelligence (AAAI). Washington, D.C., November 2012.
2012	Chair, "Workshop on Situation, Activity, Goal Awareness", ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp). Pittsburgh, PA, September 2012.
2011	Co-Chair, "Workshop on Situation, Activity, Goal Awareness", ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp). Beijing, China, September 2011.

GRANT PROPOSAL REVIEW

National Science Foundation (NSF)	
2020	ENG/IIP, SBIR/STTR, Ad-hoc Reviewer
2019	CISE, Division of Information & Intelligent Systems (IIS), Panelist
2018	CISE, Division of Information & Intelligent Systems (IIS), Panelist
2017	CISE, Division of Information & Intelligent Systems (IIS), Panelist
2016	CISE, Division of Information & Intelligent Systems (IIS), Panelist
2014	CISE, Division of Information & Intelligent Systems (IIS), Panelist
2012	CISE, Division of Information & Intelligent Systems (IIS), Panelist
2011	CISE, Division of Information & Intelligent Systems (IIS), Panelist

• National Institute of Health (NIH)

2020 Reviewer

- Patient-Centered Outcomes Research Institute (PCORI)
 - 2016 Improving Methods, Scientist Reviewer
- Swiss National Science Foundation (NSF), Swiss
 2017 Sinergia Funding Instrument, Reviewer
- The Dutch Cancer Society (KWF Kankerbestrijding), Netherlands
 2019 External Reviewer
- Freiburg Institute for Advanced Studies (FRIAS), Germany 2020 External Reviewer

JOURNAL REVIEWER & EDITORIAL ROLES

<u>Editor</u>

- Editor, PLOS ONE, 2019 (5)
- Guest Editor: Special Issue on Data Mining and Mobile Sensing in Pervasive Environments, Elsevier's Pervasive and Mobile Computing, 2014 (15+)

b. Editorial Advisory Boards

- Editorial Review Board: Journal of Ambient Intelligence and Smart Environments (JAISE) 2014-2017 (15+)
- a. <u>Reviewer for Scholarly Journals</u>
- 1. Nature, Digital Medicine, 2019 (2), 2020 (1)
- 2. Nature, Medicine, 2019 (1)
- 3. Nature, Communications, 2019 (1), 2020 (2)
- 4. Nature, Machine Intelligence, 2019 (1)
- 5. Journal of Medical Internet Research (JMIR), 2019 (1)
- 6. Intensive Care Medicine Experimental, 2019 (1)
- 7. IEEE Transaction on Mobile Computing, 2019 (1)
- 8. IEEE Access, 2019 (1), 2020 (3)
- 9. IEEE Transactions on Neural Systems & Rehabilitation Engineering (IEEE TNSRE), 2019

(1)

- 10. IEEE Transactions on Knowledge and Data Engineering (IEEE TKDE), 2018 (2), 2019 (1)
- 11. IEEE Journal of Biomedical and Health Informatics (IEEE JBHI), 2014 (1), 2015 (1), 2018 (2), 2020 (2)
- 12. Elsevier Current Opinion in Biomedical Engineering, 2018 (1)
- 13. JAMA Neurology, 2018 (1)
- 14. IEEE Transactions on Industrial Informatics (IEEE TII), 2018 (1)
- 15. IEEE Transactions on Human-Machine Systems (IEEE THMS), 2013 (1), 2014 (1), 2018 (1)
- 16. IEEE Transactions on Emerging Topics in Computing (IEEE TETC), 2013 (1), 2017 (1)
- 17. IEEE Transactions on Mobile Computing (IEEE TMC), 2017 (1)
- 18. PLOS ONE, PLOS Computational Biology, 2017 (1)
- 19. Statistical Analysis and Data Mining (SDM), 2014 (1)
- 20. ACM Transactions on Interactive Intelligent Systems (ACM TIIS), 2014 (1)
- 21. IBM Journal of Research and Development, 2014 (1)
- 22. ACM Transaction on Intelligent System and Technology (ACM TIST), 2012 (1)

CONFERENCE TECHNICAL PROGRAM COMMITTEES

- 1. Machine Learning in Biomedical Applications, Annual Meeting of the Biomedical Engineering Society (BMES), 2020
- 2. International Conference on Pervasive Health 2020
- 3. IEEE International Conference on Computers, Software and Applications (IEEE COMPSAC), 2019.
- 4. ACM International Conference on Information and Knowledge Management (CIKM), 2013, 2015, 2016.
- 5. IEEE International Conference on Data Mining (ICDM), 2012, 2015.
- 6. IEEE International Conference on Tools with Artificial Intelligence (IEEE ICTAI), 2009-2015.
- 7. IEEE International Conference on Big Data (Big Data 2015), Workshop on Deriving Value from BigData in HealthCare, 2015.
- 8. ACM International Conference on Knowledge Discovery and Data Mining (ACM KDD), 2012, 2015.

- 9. International Conference of the Association for the Advancement of Artificial Intelligence (AAAI), 2013, 2014.
- 10. ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM BCB), Workshop on Big Data in Life Sciences (BigLS), 2014.
- 11. International Conference on Data Mining (IEEE ICDM), Workshop on Data Mining and Decision Analytics for Public Health and Wellness, 2014.
- 12. International Conference on Ubiquitous Computing & Ambient Intelligence (UCAmI), 2014.
- 13. International Work Conference on Ambient Assisted Living (IWAAL), 2014.

Reviewer

- Annual Meeting of the Biomedical Engineering Society (BMES), 2020 (main conference, undergraduate session, 20+)
- IEEE Engineering in Medicine and Biology Society (EMBC), 2020.
- American Medical Informatics Association (AMIA) Annual Symposium, 2016-2019

OUTREACH & INCLUSION

2019	Artificial Intelligence in Medicine, Institute for Learning in Retirement at Oak Hammock
2019	Join detection demo, BME Outreach Event at Cade Museum
2019	Sponsoring the Madelyn Lockhart Dissertation Award, Association for Academic Women's (AAW), Emerging STEM Scholar Award
2015-2016	University Minority Mentor Program (UMMP), University of Florida
2015-2017	Iranian Student Association Advisor, University of Florida
2016-2018	UF Student Science Training Program (SSTP), University of Florida

MEDIA MENTIONS & INTERVIEWS

 CrossLink Magazine, Artificial Intelligence adds detail to health assessments in hospital intensive care units, November 2019, <u>Link</u>

- Herbert Wertheim College of Engineering, University of Florida, "UF Engineer Uses AI to Enhance Health Assessments In ICU", July 31, 2019, <u>Link</u>.
- News Story, Fox 13, "Artificial Intelligence in the ICU", February 2019, Link
- News Story, CBS, "UF researchers develop new artificial intelligence system to help ICU patients", February 2019, <u>Link</u>
- News Story, UF Health Newsroom, "University of Florida researchers develop artificial intelligence system for fast, accurate patient care", February 2019, <u>Link</u>
- News Story, The Independent Florida Alligator, "UF researchers develop stronger, better, faster powered medical technology", February 2019
- Featured Alumni, the National Academy of Engineering (NAE) Frontiers of Engineering (FOE), December 2018.
- News Story, NVIDIA Blog, "AI Assists Doctors Monitor ICU Patients", May 2018, Link
- News Story, The Benzinga Financial Media, "TAO Connect Launches Mind Elevator Tool to Alter Thinking Habits Using Machine Learning Technology", August 2017, <u>Link</u>
- News Story, The Gainesville Sun, "UF receives \$2.5 million grant to study postsurgical pain", July 2015. <u>Link</u>
- Quotes and Interview, BME Cross Link Magazine, "Computing a Healthier Future", July 2015. Link
- Quotes and Video, UF Promotional Video, "Enabling Technologies", October 2014. Link
- Quotes and Interview, New Scientist, "Smart Home Knows Just How You Like Your Breakfast", September 2009. Link

Summer 2020 – Present	Research Computing Advisory Committee (RCAC) to represent the Wertheim College of Engineering
Fall 2020 – Present	Committee Member, AI, Master's Program
Spring 2020 - Present	College of Engineering, AI Task Force

UNIVERSITY & DEPARTMENT SERVICE

Fall 2019- Present	Co-Chair, master's in applied data science Program
Fall 2019	Aging Faculty Search Committee
Fall 2015, Spring 2016, Spring 2017	BME Undergraduate Program Committee
Spring 2018, Fall 2018, Spring 2019, Fall 2019	BME Graduate Program Committee
Fall 2014, Spring 2015	BME Faculty Search Committee
Fall 2019	CISE Faculty Search Committee
Fall 2018, Spring 2019, Fall 2019	BME Executive Committee
Spring 2014 – Spring 2018 Foll 2018, Spring 2018, Spring 2010	BME Seminar Committee
Fall 2019, Spring 2018, Spring 2019, Fall 2019	BME Research Committee
Spring 2014, Spring 2016, Fall 2018	Commencement Marshal

PROFESSIONAL MEMBERSHIP

Association for computing Machinery (ACM) Professional Member	2011 - Present
Institute of Electrical and Electronics Engineers (IEEE) Senior Member	2008 - Present
IEEE Computer Society	2008 - Present
IEEE Engineering in Medicine and Biology Society (EMBS)	2015 - Present
Biomedical Engineering Society (BMES)	2013 - Present
Association for Academic Women (AAW) at the University of Florida	2014 - Present
American Association of University Women (AAUW)	2017- Present
Society of Women Engineers (SWE)	2015 - Present

Society for Imaging Informatics in Medicine (SiiM)	2019- Present
American Association for Advancement of Science (AAAS)	2020 - Present

EMPLOYMENT

August 2019-Present: Assistant Professor, Department of Industrial and Systems Engineering, University of Florida, Gainesville, FL June 2019-August 2019, Research Intern, ProcessMiner, Atlanta, GA May 2018-August 2018, Research Intern, Xtal, San Jose, CA

EARNED DEGREES

 Ph.D. in Industrial and Systems Engineering Georgia Institute of Technology, Atlanta, GA Specialization: System Informatics and Control <u>Minor:</u> Machine Learning <u>Dissertation title:</u> Modeling processes with heterogeneous high-dimensional data <u>Academic advisors:</u> Dr. Jianjun (Jan) Shi and Dr. Kamran Paynabar 	2019
M.S. in Computational Science and Engineering Georgia Institute of Technology, Atlanta, GA	2018
M.S. in Applied Mathematics Southern Illinois University Edwardsville <u>Academic advisor</u> : Dr. Urszula Ledzewicz	2012
M.S. in Civil and Environmental Engineering Southern Illinois University Edwardsville Specialization: Transportation Systems	2012
B.S. in Civil and Environmental Engineering Isfahan University of Technology, Isfahan, Iran	

TEACHING

A. INDIVIDUAL STUDENT GUIDANCE

Independent study with grads/undergraduate

<u>Jieying Zhu</u>, Ph.D. student, Fall 2019, Monitoring approaches for dynamic networks <u>James Whitehurst</u>, undergraduate, Spring 2020, data analytics for yield prediction in the agriculture industry.

B. OTHER TEACHING ACTIVITIES

1. Curriculum development – Graduate education:

High-Dimensional Data Analytics: Designed and developed a course on high dimensional data analytics with applications in healthcare and manufacturing.

2. Teaching

Instructor in ISE at the University of Florida ESI4313: Two sections of Operations Research II, Spring 2020

Instructor in ISyE at Georgia Institute of Technology ISyE3039: Methods for Quality Improvement, Spring 2019 (COA: 4.7/5) ISyE2028: *Basic Statistical Methods* (3 sessions), ISyE, Spring 2018 ISyE6739: *Statistical Methods* (3 sessions), ISyE, Spring 2018 ISyE3039: *Methods for Quality Improvement* (4 sessions), ISyE, Fall 2017 and Fall 2018

Instructor in Math department in Southern Illinois University Edwardsville College Algebra, Department of Mathematics and Statistics, Spring 2012 Differential Equations Lab, Department of Mathematics and Statistics, Fall 2011

<u>Graduate Teaching Assistant, Georgia Institute of Technology</u> ISyE3038: *Methods for Quality Improvement* (4.63/5.0), ISyE, Fall 2017 *Six Sigma*, ISyE, Spring 2017 ISyE6404: *Nonparametric Statistics* (4.31/5.0), ISyE, Fall 2015

PUBLICATIONS

Refereed Journal Papers (accepted or published)

- 1. Ebrahimi, S., Reisi Gahrooei, M., Mankad, S., Paynabar, K. (2020), Monitoring financial networks with online Hurdle models, Accepted in *IISE Transactions*.
- 2. Reisi Gahrooei, M., Yan, H., Paynabar K., Shi, J. (2020), Multiple tensor-on-tensor regression: An approach for modeling processes with heterogeneous sources of data. Accepted for publication in *Technometrics*.

(This paper is the winner of the SAS Data Mining Best Paper Award, INFORMS, 2018)

- 3. Reisi Gahrooei, M., Paynabar, K., Yan, H. (2020). Discussion on active learning methods for manifold data, accepted in *Journal of the Spanish Society of Statistics and Operations Research* (invited)
- 4. Reis Gahrooei, M., Paynabar K., Pacella, M., Colosimo, B. (2019), An adaptive fused sampling approach of high-accuracy data in the presence of low-accuracy data. *IISE* Transactions: 7:1-14.

(*This paper was a finalist for Best Student Paper Award in the Industrial and Systems Engineering Conference in the Quality Control and Reliability Engineering (QCRE) division, 2018*)

5. Reisi Gahrooei, M., Paynabar, K. (2018). Change detection in a dynamic stream of attributed networks. *Journal of Quality* Technology: 50(4):418-30

(Selected for presentation in the JQT session at 2017 INFORMS Annual Meeting)

- 6. Reisi Gahrooei, M., Paynabar K., Pacella, M., Shi, J. (2018) Process modeling and prediction with large number of high-dimensional variables using functional regression. *In press, IEEE Transactions on Automation Science and Engineering.*
- 7. Gorgannejad S, Reisi Gahrooei M, Paynabar K, Neu RW (2019). Quantitative prediction of the aged state of Ni-base superalloys using PCA and tensor regression. Acta Materialia:165:259-69.

(*This paper is the recipient of the best poster award at the Career, Research, and Innovation Development Conference (CRIDC) at Georgia Tech, 2018*)

- 8. Reisi Gahrooei, M., Zhang, Y., Ashuri, B., Augenbroe, G. (2016). Timing residential photovoltaic investments in the presence of demand uncertainties. *Journal of Sustainable Cities and Society* 20:109-123.
- 9. Reisi Gahrooei, M, Work, D. (2015). Inferring traffic signal phases from turning movement counters using hidden Markov models. *Journal of IEEE Transactions on Intelligent Transportation Systems*, 16(1):91-101.

Other Published Refereed Journal Papers (papers before joining the Ph.D. program)

- 10. Ledzewicz, U., Schättler, H., Reisi Gahrooi, M., Dehkordi SM. (2013). On the MTD paradigm and optimal control for multi-drug cancer chemotherapy. *Journal of Mathematical Biosciences and Engineering*, 10(3):803-819.
- 11. Fries, R., Reisi Gahrooei, M., Chowdhury, M., Conway, A. (2012). Meeting privacy challenges while advancing intelligent transportation systems, *Journal of Transportation Research Part C*, 25:34-45.
- 12. Fries, R., Chowdhury, M., Dunning, A., Reisi Gahrooei, M (2010). Evaluating real time parking information: Case study of a university campus. *Transportation Research Record, Journal of Transportation Research Board*.

Refereed Journal Papers (under review/revision)

13. Wang, F., Reisi Gahrooei, M, Zhong, Z, Shi, J (2020), An Augmented regression model for tensors with missing values, to be submitted to *Journal of Quality Technology*.

Refereed Conference Papers (published in proceeding)

- C1. Reisi Gahrooei, M., Mahmoudi, B., Paynabar, K. Seizure prediction in epileptic rats using multiresolution analysis, Accepted for presentation in 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, July 2018.
- C2. Reisi Gahrooei, M., Work, D. Estimating traffic signal phases from turning movement counters. *IEEE Conference on Intelligent Transportation Systems*, April 2013
- C3. Schättler, H., Ledzewicz, U., Reisi Gahrooei, M., Mahmoudian, S. A geometric analysis of bangbang extremals in optimal control problems for combination cancer chemotherapy. Proceeding to the *51st IEEE Conference on Decision and Control*, Hawaii, 2012.

INVITED PRESENTATIONS

- 1. From data fusion to computer design of experiment: Adaptive approach for sampling high accuracy data. *INFORMS 2018 Annual Meeting*, Phoenix, AZ.
- 2. When are markets out of control? Monitoring financial networks with online Hurdle models, *INFORMS 2018 Annual Meeting*, Phoenix, AZ.
- 3. Multiple tensor-on-tensor approach for modeling of a process with heterogeneous data. *INFORMS* 2018 Annual Meeting, Phoenix, AZ.
- 4. An adaptive approach for fusion of high-accuracy with low-accuracy data, QCRE best student paper session, *IISE 2018 Annual Meeting*, Orlando, FL.
- 5. Modeling and monitoring of dynamic networks with abrupt changes. *IISE 2018 Annual meeting*, Orlando, FL.
- 6. Change detection in a dynamic stream of attributed networks, *INFORMS 2017 Annual Meeting*, Houston, TX.
- 7. Process modeling and prediction with high-dimensional variables using functional regression, *INFORMS 2017 Annual Meeting*, Houston, TX.
- 8. Monitoring of dynamic sequence of networks, INFORMS 2016 Annual Meeting, Nashville, TN.

SERVICE

A. PROFESSIONAL CONTRIBUTIONS

Conference session organization

• Chair and organizer of a session on "data analytics for systems improvement" *IISE Annual conference*, New Orleans, LA, May 2020

- Chair and organizer of a session on "High-dimensional data analytics and its application in system informatics" *INFORMS 2019 Annual Meeting*, Seattle. WA, Oct. 2019.
- Chair and organizer of a session on "High-dimensional data analytics and its application in system informatics" *INFORMS 2018 Annual Meeting*, Phoenix, AZ. Nov. 2018.

Refereeing for Journals:

• Journal of Applied Statistics, Technometrics, IEEE T-ASE, Journal of Quality Technology, IIE Transactions, IEEE Sensors Letters, Quality Engineering, Data Mining and Knowledge Discovery

<u>Membership</u>: Member of Institute for Operations Research and the Management Sciences (INFORMS), Quality, Statistics, and Reliability and Data mining section of INFORMS, Institute of Industrial and Systems Engineers (IISE).

B. CAMPUS CONTRIBUTIONS

- 1- Committee member of masters of data analytics for college of engineering, Fall 2019-present
- 2- Applied OR/ data analytics search committee for ISE, Fall 2019-present
- 3- Graduate committee, ISE, Fall 2019-present
- 4- PhD Thesis committee:
 - A. Yanan Yu (ISE, Fall 2019)
 - B. Bijan Taslimi (ISE, Fall 2019)
 - C. Seonho Park (ISE, Fall 2019)

GRANTS AND CONTRACTS

- 1. Collaborative Research: A Dynamic Disruption Prediction System for Transportation Networks. Source: NSF; PI: Reisi Gahrooei; Amount: 243,016; Date: Oct 2020-Sep 2023.
- Multimodal-data Fusion-based Predictive Models for Agricultural Applications. Source: UF Informatics Institute Seed Award; PI: Reisi Gahrooei. Amount: 29,979; Date: June 2020-June 2021.
- 3. Real-time Data-driven Analysis of Economic Impacts of COVID-19 in Florida. Source: UF Informatics Institute; PI: Reisi Gahrooei. Date: June 2020-Nov 2020.
- 4. Phase-change detection through dynamic subspace learning in heterogeneous time-series, Source: ISE CRSF seed fund; PI: Reisi Gahrooei; Amount: 9,990; Date: 01/16/2020 10/15/2020
- Human trafficking demand reduction strategies through network analytics and simulation modeling; Source: ISE CRSF seed fund; PI: Alvarado (50%), Co-PI: Reisi Gahrooei (50%); Amount: 10,000; Date: 01/16/2020 – 10/15/2020

SELECTED HONORS AND AWARDS

- <u>Winner of the best paper award in SAS Data Mining Best Paper competition, INFORMS (2018).</u>
- <u>Finalist for best student paper award</u> in the Industrial and Systems Engineering Conference in the Quality Control and Reliability Engineering (QCRE) division (2018).
- <u>Best poster award at The Career, Research, and Innovation Development Conference (CRIDC) at</u> Georgia Tech (2018) for the paper: Characterizing the aged state of Ni-based Superalloys based on process variables using PCA and tensor regression.
- <u>Recipient of the high impact project</u> from Illinois department of transportation for project ICT-R27-90 (2013).
- <u>Outstanding student award</u>, Department of Mathematics and Statistics, Southern Illinois University (2011).
- <u>Recipient of the Research Grants for Graduate Students</u> (RGGS), Southern Illinois University (2011).

Catia S. Silva

Lecturer · Electrical and Computer Engineering · University of Florida · (352) 727-0657 · catiaspsilva@ece.ufl.edu

A. PROFESSIONAL PREPARATION

<u>University</u>	Location	<u>Major</u>	<u>Degree</u> & <u>Year</u>
University of Porto	Porto, Portugal	Mathematics	B.S. 2010
University of Porto	Porto, Portugal	Biomedical Engineering	M.S. 2012
University of Florida	Gainesville, FL	Electrical and Computer Engineering	M.S. 2015
University of Florida	Gainesville, FL	Electrical and Computer Engineering	Ph.D. 2018

B. APPOINTMENTS

Jul. 2019 - Present	Lecturer, Electrical and Computer Engineering, University of Florida, Gainesville, FL
Jun. 2018 – Jul. 2019	Research Scientist, Aventusoft LLC, Boca Raton, FL
Jan. 2018 – May 2018	Instructor, University of Florida, Gainesville, FL
Aug. 2013 – May 2018	Graduate Research Assistant, Computational NeuroEngineering Laboratory, University of Florida, Gainesville, FL
Jan. 2012 – June 2013	Research Scientist, Power and Energy Unit, INESC TEC, Porto, Portugal
Sep. 2010 – Jan. 2012	Graduate Research Assistant, Automatic computer-based Diagnosis system for Dermoscopy Images Laboratory, University of Porto, Porto, Portugal

C. RELEVANT PUBLICATIONS

- C.S. Silva, A. Keil & J. C. Principe, "A novel methodology to quantify dense EEG in cognitive tasks" IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Mar. 2017. DOI: <u>10.1109/ICASSP.2017.7952595</u>
- C. S. Silva, M. K. Hazrati, A. Keil & J. C. Principe, "Quantification of neural functional connectivity during an active avoidance task" IEEE International Conference on Engineering in Medicine and Biology Society (EMBC), Aug. 2016. DOI: <u>10.1109/EMBC.2016.7590800</u>

- R. J. Bessa, A. Trindade, C. S. Silva & V. Miranda, "Probabilistic solar power forecasting in smart grids using distributed information. International Journal of Electrical Power & Energy Systems, vol. 72, pp. 16-23, Nov. 2015. DOI: <u>10.1016/j.ijepes.2015.02.006</u>
- R. J. Bessa, A. Trindade, A. Monteiro, C. S. Silva & V. Miranda, "Solar power forecasting in smart grids using distributed information". Power Systems Computation Conference, Feb. 2015. DOI: <u>10.1109/PSCC.2014.7038462</u>
- C. S. Silva, A. R. S. Marçal, T. Mendonça & J. Rozeira, "Evaluation of the Menzies Method potential for automatic dermoscopic image analysis". Conference on Computational Modeling of Objects Presented in Images: Fundamentals, Methods and Applications, 3rd edition, Sep. 2012. DOI: 10.1201/b12753-19

D. SYNERGISTIC ACTIVITIES

- 1. Educational Service: Currently teaching undergraduate and graduate level courses for introductory and fundamental concepts in Machine Learning, and undergraduate level data science course. These courses include in-class participation activities as well as group activities, promoting student leadership skills and student learning styles.
- 2. Educational Outreach: Aided in the design and coursework material development of a new undergraduate course "Data Science for ECE". This course will become the foundational required course for Electrical Engineers willing to pursue a wide range of EE studies including a potential Machine Learning track. This course is completely offered in IPython environment, providing the data science material but also Python programming experience.
- 3. Professional Development supported by the CITT institute at the University of Florida.

Certificates: (1) Great Online Teaching Certificate, (2) Great Teaching Certificate, (3) Great Teaching for New Faculty Certificate, (4) Utilizing Active Learning to Enhance Student Success

Other Activities: (1) Creating Online Experiential Learning, (2) Great Teaching with Vulnerable Storytelling, (3) Asynchronous Discussions for Remote Learning.

4. Service: Serving as a Faculty mentor for the University Multicultural Mentor Program (UMMP) at the University of Florida, 2020-present.

Michael R Tonks, Ph.D.

Associate Professor Department of Materials Science and Engineering University of Florida 158 Rhines Hall Gainesville, FL 32611 Phone: (352) 846-3779; Email: michael.tonks@ufl.edu

Education and Training:

Institution	Major/Area	Degree	Year
Brigham Young University	Mechanical Engineering	B.S.	2001
Brigham Young University	Mechanical Engineering	M.S.	2002
University of Illinois in Urbana/Champaign	Mechanical Engineering	Ph.D.	2008

Research and Professional Experience:

2017-present Associate Professor, University of Florida

- Modeling fuel and cladding performance using MARMOT and BISON.
- Applying modeling and simulation to assist in the evaluation of accident tolerant reactor fuel concepts, including UO₂ with additives, U₃Si₂ and SiC cladding.
- Investigating the performance thermal protection systems for reentry vehicles

2015-2017 Assistant Professor, Pennsylvania State University

- Used BISON and MARMOT to model nuclear material performance
- Simulated the impact of surface roughness on wetting behavior
- Modeled the thermal behavior of CERMET fuels for nuclear thermal protection

2014-2015 Group lead, Idaho National Laboratory

- Led seven full time staff in the microstructure science and engineering group
- Led MARMOT development
- Simulated the coevolution of microstructure and properties of nuclear materials

2009-2014 Staff Scientist, Idaho National Laboratory

- Created the mesoscale MARMOT nuclear materials tool
- Created the phase field module and developed the tensor mechanics module in the MOOSE
- Simulated the coevolution of microstructure and properties of nuclear materials framework

2008-2009 Postdoctoral researcher, Idaho National Laboratory

- Simulated the impact of fission gas bubble formation on macroscale fuel performance using concurrent multiscale modeling
- Developed a model of the impact of elastic deformation on grain growth

Ten relevant publications:

- [1] Greenquist, M.R. Tonks, Y. Zhang, Analysis of the impact of fuel microstructure on irradiationenhanced densification using grand potential simulations, Annals of Nuclear Energy. (2020) *In press*.
- [2] K. Shrestha, T. Yao, J. Lian, D. Antonio, M. Sessim, M.R. Tonks, K. Gofryk, The grain-size effect on thermal conductivity of uranium dioxide, Journal of Applied Physics. 126 (2019) 125116. <u>https://doi.org/10.1063/1.5116372</u>.
- [3] Aitkaliyeva, C.A. Adkins, J. Hirschhorn, C. McKinney, M.R. Tonks, F.G. Di Lemma, Microstructural characterization of the as-cast and annealed Pu-10Zr alloy, Journal of Nuclear Materials. 523 (2019) 80–90. <u>https://doi.org/10.1016/j.jnucmat.2019.05.051</u>.

- [4] A.T. Motta, L. Capolungo, L.-Q. Chen, M.N. Cinbiz, M.R. Daymond, D.A. Koss, E. Lacroix, G. Pastore, P.-C.A. Simon, M.R. Tonks, B.D. Wirth, M.A. Zikry, Hydrogen in zirconium alloys: A review, Journal of Nuclear Materials. 518 (2019) 440–460. https://doi.org/10.1016/j.jnucmat.2019.02.042.
- [5] M.R. Tonks, D. Andersson, S.R. Phillpot, Y. Zhang, R. Williamson, C.R. Stanek, B.P. Uberuaga, S.L. Hayes, Mechanistic materials modeling for nuclear fuel performance, Annals of Nuclear Energy. 105 (2017) 11–24. <u>https://doi.org/10.1016/j.anucene.2017.03.005</u>.
- [6] L. Zhao, P. Chakraborty, M.R. Tonks, I. Szlufarska, On the plastic driving force of grain boundary migration: A fully coupled phase field and crystal plasticity model, Computational Materials Science. 128 (2017) 320–330. <u>https://doi.org/10.1016/j.commatsci.2016.11.044</u>.
- [7] M.R. Tonks, X.-Y. Liu, D. Andersson, D. Perez, A. Chernatynskiy, G. Pastore, C.R. Stanek, R. Williamson, Development of a multiscale thermal conductivity model for fission gas in UO2, Journal of Nuclear Materials. 469 (2016) 89–98. <u>https://doi.org/10.1016/j.jnucmat.2015.11.042</u>.
- [8] J.D. Hales, M.R. Tonks, K. Chockalingam, D.M. Perez, S.R. Novascone, B.W. Spencer, R.L. Williamson, Asymptotic expansion homogenization for multiscale nuclear fuel analysis, Computational Materials Science. 99 (2015) 290–297. https://doi.org/10.1016/j.commatsci.2014.12.039.
- [9] R.L. Williamson, J.D. Hales, S.R. Novascone, M.R. Tonks, D.R. Gaston, C.J. Permann, D. Andrs, R.C. Martineau, Multidimensional multiphysics simulation of nuclear fuel behavior, Journal of Nuclear Materials. 423 (2012) 149–163. <u>https://doi.org/10.1016/j.jnucmat.2012.01.012</u>.
- [10] M.R. Tonks, D. Gaston, P.C. Millett, D. Andrs, P. Talbot, An object-oriented finite element framework for multiphysics phase field simulations, Computational Materials Science. 51 (2012) 20–29. <u>https://doi.org/10.1016/j.commatsci.2011.07.028</u>.

Patents, Copyrights, and Software Systems

• Original creator of the MARMOT tool in August, 2009.

Synergistic Activities:

- MARMOT Development Team Leader, Aug 2009 to Aug 2015, lead development of the MARMOT mesoscale computational nuclear material tool as part of the Nuclear Energy Advanced Modeling and Simulation Program's Fuels Product Line.
- NEAMS Work Package Manager, Aug 2013 to Aug 2015, managed INL's lower length-scale model development package in the DOE Nuclear Energy Advanced Modeling and Simulation Program's Fuels Product Line.
- PI of INL Laboratory Directed R&D (LDRD) project, June 2013 to Aug 2015, lead team of experimentalists and modelers to develop a fundamental model of hydride formation and reorientation in pure zirconium and zirconium alloys.
- Chair of the TMS Nuclear Materials Committee, 2019 Present
- Honors and awards:
 - o 2017: Presidential Early Career Award for Scientists and Engineers
 - o 2015: ANS Materials Science and Technology Division Special Achievement Award
 - 2014: Idaho National Laboratory Early Career Exceptional Achievement Award, US DOE Nuclear Energy Advanced Modeling and Simulation Program Excellence Award, TMS SMD Young Leader Professional Development Award.

NSF BIOGRAPHICAL SKETCH

NAME: Zare, Alina

ORCID: 0000-0002-4847-7604

POSITION TITLE & INSTITUTION: Professor, University of Florida

(a) **PROFESSIONAL PREPARATION**

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
University of Florida	Gainesville, FL	Computer Engineering	BENG	2003
University of Florida	Gainesville, FL	Computer Engineering	MS	2008
University of Florida	Gainesville, Fl	Computer & Information Science & Engineering	Ph.D.	2008

(b) APPOINTMENTS

2020 - present	Professor, University of Florida, Electrical and Computer Engineering, Gainesville, FL
2016 - 2020	Associate Professor, University of Florida, Electrical and Computer Engineering, Gainesville, FL
2016 - 2016	Associate Professor, University of Missouri, Electrical and Computer Engineering, Columbia, Missouri
2010 - 2016	Assistant Professor, University of Missouri, Electrical and Computer Engineering, Columbia, Missouri

(c) PRODUCTS

Products Most Closely Related to the Proposed Project

- Weinstein B, Marconi S, Bohlman S, Zare A, White E. Individual Tree-Crown Detection in RGB Imagery Using Semi-Supervised Deep Learning Neural Networks. Remote Sensing. 2019 June 01; 11(11):1309-. Available from: https://www.mdpi.com/2072-4292/11/11/1309 DOI: 10.3390/rs11111309
- 2. Zou S, Gader P, Zare A. Hyperspectral tree crown classification using the multiple instance adaptive cosine estimator. [Preprint]. 2018 July 26. DOI: 10.7287/peerj.preprints.27052
- Xiaoxiao Du, Alina Zare. Multiresolution Multimodal Sensor Fusion for Remote Sensing Data With Label Uncertainty. IEEE Transactions on Geoscience and Remote Sensing. 2020 April; 58(4):2755--2769. Available from: https://doi.org/10.1109/TGRS.2019.2955320 DOI: 10.1109/TGRS.2019.2955320
- Xiaoxiao Du, Alina Zare. Multiple Instance Choquet Integral Classifier Fusion and Regression for Remote Sensing Applications. IEEE Transactions on Geoscience and Remote Sensing. 2019 May; 57(5):2741--2753. Available from: https://doi.org/10.1109/TGRS.2018.2876687 DOI: 10.1109/TGRS.2018.2876687

 Jiao C, Chen C, McGarvey R, Bohlman S, Jiao L, Zare A. Multiple instance hybrid estimator for hyperspectral target characterization and sub-pixel target detection. ISPRS Journal of Photogrammetry and Remote Sensing. 2018 December; 146:235-250. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0924271618302314 DOI: 10.1016/j.isprsjprs.2018.08.012

Other Significant Products, Whether or Not Related to the Proposed Project

- Zare A, Gader Senior P. Sparsity promoting iterated constrained endmember detection with integrated band selection. 2007 IEEE International Geoscience and Remote Sensing Symposium. 2007 IEEE International Geoscience and Remote Sensing Symposium; ; Barcelona, Spain. IEEE; c2007. Available from: http://ieeexplore.ieee.org/document/4423737/ DOI: 10.1109/IGARSS.2007.4423737
- Jiao C, Su B, Lyons P, Zare A, Ho K, Skubic M. Multiple Instance Dictionary Learning for Beat-to-Beat Heart Rate Monitoring From Ballistocardiograms. IEEE Transactions on Biomedical Engineering. 2018 November; 65(11):2634-2648. Available from: https://ieeexplore.ieee.org/document/8307229/ DOI: 10.1109/TBME.2018.2812602
- Zare A, Bolton J, Gader P, Schatten M. Vegetation Mapping for Landmine Detection Using Long-Wave Hyperspectral Imagery. IEEE Transactions on Geoscience and Remote Sensing. 2008 January; 46(1):172-178. Available from: http://ieeexplore.ieee.org/document/4389068/ DOI: 10.1109/TGRS.2007.906438
- Zare A, Gader P, Casella G. Sampling Piecewise Convex Unmixing and Endmember Extraction. IEEE Transactions on Geoscience and Remote Sensing. 2013 March; 51(3):1655-1665. Available from: http://ieeexplore.ieee.org/document/6297456/ DOI: 10.1109/TGRS.2012.2207905
- Zare A, Jiao C, Glenn T. Discriminative Multiple Instance Hyperspectral Target Characterization. IEEE Transactions on Pattern Analysis and Machine Intelligence. 2018 October 1; 40(10):2342-2354. Available from: https://ieeexplore.ieee.org/document/8051065/ DOI: 10.1109/TPAMI.2017.2756632

(d) SYNERGISTIC ACTIVITIES

- 1. Program Chair for Phenome 2020 (as well as other relevant workshops and conferences).
- 2. Revised undergraduate and graduate level Supervised Machine Learning and Unsupervised Machine Learning courses to be student-centered active learning courses which include in-class individual and group activities.
- 3. Developed a set of outreach activities for incoming college freshman and high school students to teach remote sensing and spectroscopy concepts. These outreach activities will be implemented at the University of Florida through the STEPUP and Freshman Bridge programs.
- 4. Participated in technology transfer to multiple government defense agencies by providing programs, papers, and presentations.

XILEI ZHAO

Department of Civil and Coastal Engineering, University of Florida 504 Weil Hall, 1949 Stadium Rd, Gainesville, FL 32611

o Phone: +01 (352) 294-7159 o Email: xilei.zhao@essie.ufl.edu

o Webpage: https://faculty.eng.ufl.edu/sermos-lab

EDUCATION

Johns Hopkins University	Baltimore, Maryland
 Ph.D. in Civil Engineering (Concentration: Systems Engineering) M.S.E. in Applied Mathematics and Statistics M.S.E. in Civil Engineering 	2017 2017 2016
Southeast University	Nanjing, China
· B.E. in Civil Engineering	2013
PROFESSIONAL EXPERIENCE	
University of Florida (UF)	2019-
 Assistant Professor, Department of Civil and Coastal Engineering Affiliate Assistant Professor, Department of Industrial and System Engineering Affiliate Faculty, University of Florida Transportation Institute 	
Georgia Institute of Technology (GT)	2018-2019
\cdot Postdoctoral Fellow, H. Milton Stewart School of Industrial and Systems Engineeri	ng
University of Michigan (UM)	2017-2018
· Research Fellow, Department of Industrial and Operations Engineering	
Johns Hopkins University (JHU) · Research Assistant & Teaching Assistant, Department of Civil Engineering	2014-2017

PUBLICATIONS & PATENT

(Note: The student supervised by me is underlined.)

Work in Progress

[5] <u>Xu, Y.</u>, Yan, X., Sisiopiku, V. P., Merlin, L. A., Xing, F., & **Zhao, X.** Micromobility trip origin and destination inference using General Bikeshare Feed Specification (GBFS) data. (Under review)

[4] Yuan, F., **Zhao, X.**, Liu, R., & Li, M. Supporting crisis response with Internet of Things (IoT) based systems. (Under review)

[3] Merlin, L., Yan, X., Xu, Y., & **Zhao, X.** A segment-level model of shared scooter origins and destinations. (Under revision) [2] <u>Xu, Y.</u>, Yan, X., Liu, X., & **Zhao**, **X.** Identifying key factors associated with ride-splitting adoption rate and modeling their nonlinear relationships. (Under revision)

[1] Yan, X., **Zhao, X.**, Han, Y., Van Hentenryck, P., & Dillahunt, T. Mobility-on-demand versus fixed-route transit systems: An evaluation of traveler preferences in low-income communities. (Under review)

Published/In Press

[23] Zhang, X., & **Zhao**, X. (2021). A clustering-aided ensemble method for predicting ridesourcing demand in Chicago. Proceedings of Transportation Research Board 100th Annual Meeting. (Accepted)

[22] <u>Xu, Y.</u>, Yan, X., Sisiopiku, V. P., Merlin, L. A., Xing, F., & **Zhao**, X. (2021). Micromobility trip origin and destination inference using General Bikeshare Feed Specification (GBFS) data. Proceedings of Transportation Research Board 100th Annual Meeting. (Accepted)

[21] <u>Noei, S.</u>, & **Zhao, X.** (2021). Longitudinal dynamics in traffic microsimulation. Proceedings of Transportation Research Board 100th Annual Meeting. (Accepted)

[20] **Zhao, X.**, Wang, X., Yan, X., & <u>Cao, Z.</u> (2021). Assessing preference heterogeneity for Mobility-on-Demand transit service in low-income communities: A latent segmentation based decision tree method. Proceedings of Transportation Research Board 100th Annual Meeting. (Accepted)

[19] Wang, X., Yan, X., **Zhao, X.**, & <u>Cao, Z.</u> (2021). Identifying latent shared mobility preference segments in low-resourced communities: Ride-hailing, fixed-route bus, and mobility-on-demand transit. Proceedings of Transportation Research Board 100th Annual Meeting. (Accepted)

[18] **Zhao, X.**, Lovreglio, R., Kuligowski, E., & Nilsson, D. (2020). Using Artificial Intelligence for safe and effective wildfire evacuations. Fire Technology.

[17] **Zhao, X.**, Yan, X., <u>Yu, A.</u>, & Van Hentenryck, P. (2020). Prediction and behavioral analysis of travel mode choice: A comparison of machine learning and logit models. Travel Behaviour and Society, 20, 22-35.

[16] Yan, X., <u>Liu, X.</u>, & **Zhao, X.** (2020). Using machine learning for direct demand modeling of ridesourcing services in Chicago. Journal of Transport Geography, 83, 102661.

[15] **Zhao, X.**, Lovreglio, R., & Nilsson, D. (2020). Modelling and interpreting pre-evacuation decisionmaking using machine learning. Automation in Construction, 113, 103140.

[14] **Zhao, X.**, Zhou, Z., Yan, X., & Van Hentenryck, P. (2020). Distilling black-box travel mode choice model for behavioral interpretation. Proceedings of Transportation Research Board 99th Annual Meeting, Washington, DC.

[13] **Zhao, X.**, <u>Liu, X.</u>, & Yan, X. (2020). Modeling demand for ridesourcing services in the City of Chicago: A direct demand machine learning approach. Proceedings of Transportation Research Board 99th Annual Meeting, Washington, DC.

[12] <u>Liu, X.</u>, Van Hentenryck, P., & **Zhao, X.** (2020). Optimization models for estimating transit network origin-destination flows with AVL/APC data. Proceedings of Transportation Research Board 99th Annual Meeting, Washington, DC.

[11] Yan, X., Levine, J., & **Zhao, X.** (2019). Integrating ridesourcing services with public transit: An evaluation of traveler responses combining revealed and stated preference data. Transportation Research Part C: Emerging Technologies, 105, 683-696.

[10] **Zhao, X.**, Miers, I., Green, M., & Mitrani-Reiser, J. (2019). Modeling the cybersecurity of hospitals in natural and man-made hazards. Sustainable and Resilient Infrastructure, 4(1), 36-49.

[9] **Zhao, X.**, & Spall, J. C. (2019). An integrated model for transportation networks and travel time reliability. Proceedings of Transportation Research Board 98th Annual Meeting, Washington, DC.

[8] **Zhao, X.**, & Spall, J. C. (2018). A Markovian framework for modeling dynamic network traffic. Proceedings of American Control Conference (ACC), 6616-6621, Milwaukee, WI.

[7] **Zhao, X.**, Chodur, G., Biehl, E., Neff, R., & Mitrani-Reiser, J. (2018). Food security in the aftermath of a seismic event. Proceedings of 11th National Conference on Earthquake Engineering (11NCEE), Los Angeles, CA.

[6] Chodur, G., **Zhao, X.**, Biehl, E., Mitrani-Reiser, J., & Neff, R. (2018). Assessing food system vulnerabilities: A fault tree modeling approach. BMC Public Health, 18(1), 817.

[5] Links, J. M., Schwartz, B. S., Lin, S., Kanarek, N., Mitrani-Reiser, J., Sell, T. K., Boddie, C. R., Ward, D., Slemp, C., Burhans, R., Gill, K., Igusa, T., **Zhao, X.**, Aguirre, B., Trainor, J., Nigg, J., Inglesby, T., Carbone, E., & Kendra, J. M. (2017). COPEWELL: A conceptual framework and system dynamics model for predicting community functioning and resilience after disasters. Disaster Medicine and Public Health Preparedness, 12(1), 127-137.

[4] **Zhao, X.**, & Mitrani-Reiser, J. (2017). Developing a multi-hazard weighting scheme for community resilience indicators. Proceedings of the 16th World Conference on Earthquake Engineering (16WCEE), Santiago, Chile.

[3] Lu, J., Dong, X., **Zhao, X.**, Wu, X., & Shu, G. (2017). Form-finding analysis of a new type of cablestrut tensile structures generated by semi-regular tensegrity. Advances in Structural Engineering, 20(5), 772–783.

[2] **Zhao, X.**, & Spall, J. C. (2016). Estimating travel time in urban traffic by modeling transportation network systems with binary subsystems. Proceedings of American Control Conference (ACC), 803–808, Boston, MA.

[1] Lu, J., Wu, X., **Zhao, X.**, & Shu, G. (2015). Form finding analysis of cable-strut tensile dome based on tensegrity torus. Engineering Mechanics, 32(6), 66–71. (in Chinese)

Patent

[1] Lu, J., **Zhao, X.**, Shu, G., Qiang, H., Cao, X., & Wang, Z., "A new type of cable-strut tensile roof system and its construction method." China Patent No.201310237601.X, issued October 23, 2013.

TEACHING

Instructor for CGN 4905/6905 Transportation Data Analytics at UF	Fall 2020
Instructor for CGN 6905 Machine Learning Applications in Civil Engineering at UF Enrollment: 29; Course evaluation: 4.47/5.00	Spring 2020
Lecturer for Two-Day Workshop of Applying Statistical Methods in Traffic Modeli University	ing at Morgan State Apr 2018
Teaching Assistant for EN.560.220 Civil Engineering Analysis at JHU Fa	all 2014 & Fall 2015

MENTORSHIP
Yiming Xu, UF Ph.D. Student in Civil and Coastal Engineering	2019-
Mudit Paliwal, UF M.S. Student in Industrial and Systems Engineering	2020-
Zhuoxuan Cao, UF M.S. Student in Civil and Coastal Engineering	2020-
Ningzhe Xu, UF M.S. Student in Civil and Coastal Engineering	2020-
Kaitai Yang, UF M.S. Student in Civil and Coastal Engineering	2020-
Shirin Noei, UF Ph.D. Student in Civil and Coastal Engineering · Current position: Research Assistant Professor at Tennessee Tech University	2019-2020
Xinyu Liu, GT Ph.D. Student in Industrial and Systems Engineering	2018-2019
Alan Yu, UM BS'20 in Computer Science	2018-2018
Jacob Ketterer, UM BS'18 in Computer Science	2017-2018

GRANTS

Pending Support

Scalable charging and rebalancing solutions for shared connected and automated vehicles

- · X. Zhao (Co-PI), X. Sun (PI)
- · NSF S&CC Planning Grant; May, 2020 May, 2021; \$150,000

Real-time management of micromobility services for smart cities

- · X. Zhao (PI), X. Sun (Co-PI), Y. Yang (Co-PI)
- · UF Research Artificial Intelligence Research Catalyst Fund; Jan, 2021 Dec, 2021; \$50,000

Smart multimodal mobility options for the town of Miami Lakes to link housing, jobs, and activity centers

- · X. Zhao (Co-PI), S. Srinivasan (PI), L. Elefteriadou (Co-PI), L. Du (Co-PI), R. Steiner (Co-PI)
- · NSF Civic Innovation Challenge Track A; Dec, 2020 Mar, 2021; \$49,965

Current Support

Analyzing wildfire evacuation behavior with GPS data

- · X. Zhao (PI), R. Lovreglio (Co-PI), D. Nilsson (Co-PI), K. Nguyen (Co-PI), E. Kuligowski (Senior Personnel)
- · NIST; Sept, 2020 Aug, 2021; \$99,999

Mobility-on-Demand transit for smart and sustainable cities

- X. Zhao (PI), N. Kaza (Co-PI), N. Kittner (Co-PI), N., McDonald (Co-PI), V. Sisiopiku (Co-PI), X. Jin (Co-PI), J. LaMondia (Co-PI), X. Yan (Co-PI), A. Broaddus (Co-PI)
 USDOT STRIDE UTC; Sept, 2019 Aug, 2020; \$413,430
- Modeling of evacuation behavior in the 2019 Kincade Fire, Sonoma County, California
- · X. Zhao (PI), R. Lovreglio (Senior Personnel), E. Kuligowski (Senior Personnel), D. Nilsson (Senior Personnel)

· Natural Hazards Center Quick Response Research Grant Program; Feb, 2020 - Dec, 2020; \$3,000

Community-driven evacuation planning and scheduling

- · X. Zhao (PI), R. Liu (Co-PI)
- · Florida Sea Grant Program Development Funding; Feb, 2020 Feb, 2021; \$10,000

An IoT-enabled critical infrastructure information network for a future resilient city

- · X. Zhao (Co-PI), R. Liu (PI), X. Yu (Co-PI)
- The Florida Institute for Built Environment Resilience (FIBER) Florida Resilient Cities Program; Jan, 2020 Jun, 2020; \$6,667

Micro-mobility as a solution to reduce urban traffic congestion

- · X. Zhao (PI), V. Sisiopiku (Co-PI), R. Steiner (Co-PI)
- · USDOT STRIDE UTC; Nov, 2019 Apr, 2020; \$134,759

Previous Support

Mobilizing accessibility in Detroit and Ypsilanti

- · X. Zhao (Co-PI), P. Van Hentenryck (PI), X. Yan (Co-PI)
- · Total award: \$50,000
- · The UM Poverty Solutions' Project Development Funding Program

Modeling and estimation in urban transportation networks Sept, 2017 - Aug, 2018

- · X. Zhao (UM Sponsor PI), J. Spall (APL PI), E. Kemajou-Brown (MSU PI)
- · UM subcontract: \$6,000; Total award: \$100,000
- · The Johns Hopkins University Applied Physics Laboratory (APL) IRAD Program

INVITED TALKS

[19] Introduction to data analytics for transportation. UFTI Webinar, 2020. (Co-presented with Xiang Yan and Sanjay Ranka)

[18] Stakeholder engagement: Experience with industry partners. The STRIDE webinar on stakeholder engagement, 2020.

[17] Autonomous vehicles and micromobility in a disruptive society and transportation system. The 5th Conference on Sustainable Urban Mobility, 2020. (Co-presented with Lily Elefteriadou and Lili Du)

[16] The need for transportation resilience in the era of climate change. The 10th Annual WTS Symposium, Gainesville, FL, 2020.

[15] Data science applications in transportation. Seminar hosted by WTS UF Student Chapter and ITE UF Student Chapter, Gainesville, FL, 2019.

[14] Data science applications in transportation. The Industrial and Systems Engineering (ISE) Seminar Series, Gainesville, FL, 2019.

[13] Data-driven resilience modeling for critical infrastructure systems. The 3rd Civil Engineering Overseas Chinese Scholars Forum, Nanjing, China, 2019.

Jan, 2018 - Dec, 2018

[12] Extracting behavioral insights from black-box models. The 2nd Workshop on Machine Learning Methods to Calibrate Integrated Land Use-Transport Models, Atlanta, GA, 2019.

[11] Travel behavior modeling using machine learning. Department of Civil and Environmental Engineering, Princeton University, 2019.

[10] Travel behavior modeling using machine learning. Department of Civil and Environmental Engineering, University of California, Los Angeles (UCLA), 2019.

[9] Travel behavior modeling using machine learning. Department of Civil and Coastal Engineering, University of Florida, 2019.

[8] Travel behavior modeling using machine learning. School of Environmental, Civil, Agricultural and Mechanical Engineering, University of Georgia, 2019.

[7] Travel behavior modeling using machine learning. Department of Civil Engineering, University of Texas, Arlington, 2019.

[6] Travel behavior modeling using machine learning. Department of Civil and Environmental Engineering, Temple University, 2019.

[5] Travel behavior modeling using machine learning. Department of Civil and Environmental Engineering and Construction, University of Nevada, Las Vegas, 2019.

[4] Travel behavior modeling using machine learning. Algorithms, Combinatorics and Optimization (ACO) Student Seminar, Georgia Institute of Technology, 2019.

[3] Multi-scale community resilience modeling for hazards. Department of Civil and Environmental Engineering, University of Maryland, College Park, 2017.

[2] Simulation as tool for urban traffic dynamics under hazards. Student Seminar of Applied Mathematics and Statistics, Johns Hopkins University, 2016.

[1] Estimating travel time in urban traffic by modeling transportation network systems with binary subsystems. Research Expo of Civil Engineering, Johns Hopkins University, 2015.

CONFERENCE PRESENTATIONS

[14] Can micromobility reduce urban traffic congestion? The 2020 ITE Annual Meeting, 2020. (Copresented with Virginia Sisiopiku)

[13] Applying machine learning to investigate human behavior in disasters. The 2020 Natural Hazards Center Researchers Meeting, 2020.

[12] Distilling black-box travel mode choice model for behavioral interpretation. The Transportation Research Board (TRB) 99th Annual Meeting, Washington, DC, 2019.

[11] Mobility-on-demand v.s. fixed-route transit systems: An evaluation of traveler preferences in low-income communities. The 2019 INFORMS Annual Meeting, Seattle, WA, 2019.

[10] Community-driven evacuation planning, scheduling, and recovery. Georgia Sea Grant Research Symposium, Brunswick, GA, 2019.

[9] An integrated model for transportation networks and travel time reliability. Transportation Research Board 98th Annual Meeting, Washington, DC, 2019.

[8] A Markovian framework for modeling dynamic network traffic. The American Control Conference, Milwaukee, WI, 2018.

[7] Food security in the aftermath of a seismic event. The 11th National Conference on Earthquake Engineering, Los Angeles, CA, 2018.

[6] A case study for redesigning public transit with shared mobility. Data Science for Transportation Research Challenge Symposium, Michigan Institute for Data Science, University of Michigan, 2018.

[5] Identification of dynamic traffic network: A statistical approach. The Joint Statistical Meetings 2017, Baltimore, MD, 2017.

[4] Developing a multi-hazard weighting scheme for community resilience indicators. The 16th World Conference on Earthquake Engineering, Santiago, Chile, 2017.

[3] Estimating travel time in urban traffic by modeling transportation network systems with binary subsystems. The American Control Conference 2016, Boston, MA, 2016.

[2] Modeling the interactions between cyber capabilities and critical infrastructure-based societal system functioning in disasters. The Probabilistic Mechanics and Reliability Conference 2016, Nashville, TN, 2016.

[1] Agent-based modeling and simulation for urban search and rescue after earthquakes. The 67th Annual Meeting of the Earthquake Engineering Research Institute: Old Cities, New Earthquakes, San Fransisco, CA, 2015.

HONORS & AWARDS

The 11th National Conference on Earthquake Engineering Registration Grant • Earthquake Engineering Research Institute	Jun 2018
Applied Mathematics and Statistics Award for Outstanding Master's Research \cdot Johns Hopkins University	May 2017
Duncan Fund for the Advancement of Research in Statistics Travel Award \cdot Johns Hopkins University	Jul 2016 & Jul 2017
Whiting School of Engineering Centennial Fellowship · Johns Hopkins University	2013 - 2014
First Prize • The 2013 National Civil Engineering Innovation Award for Undergraduate Students	Nov 2013 s (China)
Best Creativity Award & My Favorite Program • The 6th National College Innovation and Entrepreneurship Annual Meeting (China)	Nov 2013
Second Prize of Teaching Competition · New Oriental Education and Technology Group Inc. (Nanjing Division of China)	Dec 2012
Excellent Paper Award & Second Prize of Mutual Support Structure Contest · The 2nd National Civil Engineering Student Forum (China)	Aug 2012
Excellence Award of Structure Innovation Competition · Southeast University	Apr 2012

Model Student of Academic Records \cdot Maintained ranking of top 5% in the first two academic years at the Southeast University	Nov 2011
Jin Baozhen Alumni Scholarship · Southeast University	Apr 2011

SERVICE AND PROFESSIONAL AFFILIATIONS

Journal/Conference Referee

- Transportation Research Part A: Policy and Practice
- · Transportation Research Part C: Emerging Technologies
- · Transportation Research Part D: Transport and Environment
- · Transportation Research Part E: Logistics and Transportation Review
- · Natural Hazards Review
- · Fire Technology
- · Safety Science
- · Journal of Building Engineering
- · IEEE Transactions on Automatic Control
- · IEEE Transactions on Intelligent Transportation Systems
- · IEEE Conference on Decision and Control
- · American Control Conference
- · TRB Annual Meetings and Transportation Research Record
- · International Journal of Sustainable Transportation

Steering Committee Member of the Interstate Transit Research Symposium (2020-)

Organizer of the 6th Annual Resiliency Simulation and Workshop at TRB 2021 (2020-)

Committee Member of new M.S. degree in AI Systems, UF (2020-)

Organizer of 2020 UN International Women and Girls in Science Day at UF (2020)

Committee Member of new M.S. degree in Applied Data Science, UF (2019-2020)

Supervisor, Undergraduate Senior Design (Project: Redesigning Public Transit Systems for Atlanta), GT (2018-2019)

Poster Judge, Undergraduate Research Opportunity Program Symposium, UM (2018)

Mentor, Undergraduate Research Opportunity Program, UM (2018-2018)

President (2016-2017) and **Vice President** (2015-2016), Earthquake Engineering Research Institute's Student Chapter at JHU

Academic Coordinator, Civil Engineering Graduate Board, JHU (2016-2017)

Organizer, Emergency Preparedness Patch Program for Girl Scouts, JHU (2016)