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Curriculum Vitae

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1 BIOGRAPHICAL DATA

1.1 NAME

Ivan I. Garibay

1.2 EDUCATION

Ph.D. in Computer Science, 2000-2004

School of Computer Science, University of Central Florida

Dissertation title: The Proteomics Approach to Evolutionary Computation: An Analysis of Proteome-based Location Independent Representations Based on the Proportional Genetic Algorithm.

M.Sc. in Computer Science, 1997-2000

Computer Science Department, University of Central Florida

Thesis title: Automatic Generation of Natural Language Documentation from Statecharts.

P.E. in Electronic Engineering (Professional Engineering license), 1995

Electronic Engineering Department, Ricardo Palma University.

B.Sc. in Electronic Engineering, Highest Honors, 1990-1994

Electronic Engineering Department, Ricardo Palma University.

Languages: Fluent in English and Spanish

1.3 IMPACT OF RECENT ACTIVITIES

1.3.1 RESEARCH

My research impact can be measured by productivity in terms of publications and grants, scholarly stewardship via the development of interdisciplinary research teams and programs, and real-world impact via patents and press coverage that my research has received.

First, since starting my appointment at the University of Central Florida in Fall 2016, I have contributed 129 scholarly publications. Among these publications are 31 peer-reviewed journal articles, including publications in high-impact venues like the *Journal of Cleaner Production* (impact factor 11.1¹, 6th most cited venue in Engineering and Computer Science²), the *International Journal of Human-Computer Interaction* (impact factor 4.7), and *Nature Scientific Reports* (impact factor 4.6). I also contributed 61 peer-reviewed conference proceedings papers, including publications at top venues such as the Conference on Neural Information Processing Systems (NeurIPS). NeurIPS is the premier venue in Arti-

¹The source for all journal impact factors on this document is the *Clarivate Journal Citations Report 2022*. This report can be accessed here: <https://jcr.clarivate.com/jcr/home?Init=Yes&SrcApp=IC2LS>

²Google Scholar metrics: https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=eng

cial Intelligence (rated #1 in Google Scholar ³ and with impact factor 23.27 ⁴.) I gave 98 peer-reviewed conference presentations, including the *best paper award* at the Computational Social Science Society of the Americas annual meeting in 2019. As evidence of my research impact, since 2016, I have given 51 invited presentations (7 international), including 5 invited keynote addresses, one invited to talk to the *Google-Alphabet Scholar Speaker Series*, and one congressional testimony to the *Artificial Intelligence–Opportunities and Challenges Forum*, invited by US Congressman Darren Soto. In addition, according to Google Scholar⁵, my publications have been cited over 3019 times, and I currently have an H-index of 27, in the top 76th-89th percentile among full professors at top-ranked universities in engineering disciplines.^{6,7} My work has been recognized internally, winning a UCF Research Incentive Award in 2022 and a *UCF Luminary Award* in 2026 (for notable accomplishments in research demonstrating significant national or international impact), and externally by the Industrial Engineering and Operations Management (IEOM) Society International’s *Outstanding Professor Award* in 2023 and *Outstanding Educator Award* in 2025. In 2026, I was elected Associate Member of the *Academy of Science, Engineering and Medicine of Florida* (ASEMFL), the state’s counterpart to the National Academies, for pioneering work in artificial intelligence for modeling complex human behavior.

Second, concerning grant funding, since 2016, I have helped to secure and manage over \$36.8 million in funding awarded to UCF. This funding includes \$32.6 million as principal investigator (PI), \$3.6 million as Co-PI of federal funding, and \$1.0 million as PI of industry funding. These awards come from a variety of sources, including National Science Foundation (NSF) (6), Defense Advance Project Agency (DARPA) (3), Disney (2), Microsoft (2), etc. My largest award to date is the \$20 million NSF *National Commercialization and Translation Institute (NCTI) Pilot Program* Cooperative Agreement (PI, 2026–2028), a national pilot that conducts evaluative research on reliably translating publicly funded deep-technology R&D into commercial success. Because of this, I have been continually ranked as one of the top UCF faculty for research funding.

Third, as evidence of scholarly stewardship, in this period, I have mentored 23 undergraduate researchers, 16 doctoral students (major academic advisor), 8 postdoctoral students (including a student from a Nobel Prize-winning economist), and 4 research faculty. Of the 16 doctoral students, 3 are under my supervision, and 13 have already graduated. One has been recognized as a *DARPA Riser 2022*. A group of the 30 most promising young scientists nationally recognized by the DARPA director. Another of my graduates won the *2023 R&D 100 Award (Oscars of Innovation)*. My doctoral graduates are currently employed by various academic and research institutions, including the Massachusetts Institute of Technology (MIT), Argon National Laboratory, the University of Northern Colorado, and the University of Illinois Urbana-Champaign. I have also built a network of collaborators, approximately

³https://scholar.google.es/citations?view_op=top_venues&hl=en&vq=eng_artificialintelligence

⁴https://health-nlp.com/posts/2022_journal_impact_factors_for_CS_conferences.html

⁵<https://scholar.google.com/citations?user=rPuLfoMAAAAJ&hl=en&oi=ao>

⁶Eva Lillquist and Sheldon Green, The discipline dependence of citation statistics, *Scientometrics* (2010), 84:749–762. DOI: <https://doi.org/10.1007/s11192-010-0162-3>

⁷L. Czarnecki, M.P. Kazmierkowski, and A. Rogalski, Doing Hirsch proud; shaping H-index in engineering sciences, *Bulletin of the Polish Academy of Sciences* (2013), 61:1, DOI: <https://doi.org/10.2478/bpasts-2013-0001>

53 UCF faculty and 14 external faculty, with whom I have written interdisciplinary grants, coauthored papers, or both. My external collaborators come from a variety of research-intensive institutions, including MIT, New York University, University of Chicago, Argonne National Laboratory, University of North Carolina at Chapel Hill, North Carolina State University, Florida Institute of Technology, University of South Florida, University of Michigan, University of Maryland and the Santa Fe Institute. Regarding federal funding stewardship, I have served as a panelist or proposal reviewer eight times in this period for federal funding agencies, including the National Science Foundation and the Department of Energy.

Finally, as evidence of real-world impact, my research has received one patent (US12210833B2, 2025) for a deep learning architecture designed to finetune large language models to detect sarcasm in social media and we have filed for a patent on a novel mRNA foundation model. As further evidence of impact, my research has been featured in multiple national and international press outlets, including NBC's The Tonight Show Starring Jimmy Fallon, the Los Angeles Times, Defense One, IEEE Spectrum, Tech News (Taiwan), and The Tribune (India).

1.3.2 TEACHING

I aim to impact my student's educational experience by creating and delivering high-quality programs and courses that respond to scientific developments and industry workforce needs. My commitment to teaching has been recognized by UCF in 2026 with the *Teaching Incentive Program (TIP) Award*, presented by the Vice Provost for Faculty Excellence in recognition of outstanding contributions in teaching and learning.

First, I started and am currently directing a graduate program in data sciences at UCF—the Master of Science in Data Analytics (MSDA)⁸. This program is a collaboration between the College of Engineering and Computer Science and the College of Science. I started it in 2016 and now employ an assistant director, an associate director, and several lecturers full-time, in addition to the multiple tenured faculty teaching part-time. This program has sustained growth of 30% each year (except during the pandemic) in applications, has graduated over 240 students, and has brought to UCF more than \$8.4M in revenue. So far, this program has 100% placement. All our graduates either find employment in the data science industry or are admitted to a doctoral program 6-months after graduation. I have recently added an Artificial Intelligence (AI) track to the MSDA in response to our industry partners' growing focus on artificial intelligence.

Second, I have created five courses. I developed a course on *Artificial Intelligence for Industrial Engineers* for undergraduate students. For graduate students, I developed four courses: *Introduction to Artificial Intelligence for Industrial Engineers*, *Advanced Artificial Intelligence for Industrial Engineers*, *Agent-Based Modeling for Social Systems*, and *Advanced Agent-Based Modeling*. These courses contribute to artificial intelligence and modeling & simulation, two strategic focus areas at UCF. I have also updated an undergraduate course on *Decision Support Systems* to include Python notebooks on data analytics and machine learning⁹.

⁸For more information on Master of Science in Data Analytics see: <https://www.ce.ucf.edu/credit/master-data-analytics/>

⁹The developed Jupyter notebooks are available at GitHub: <https://github.com/igaribay/DSSwithPyt>

Finally, I have co-designed the *capstone* course for the MSDA program. By closely listening to the advice of our industry advisory board and by leveraging 6 years of continuous NSF funding for the UCF I-Corps program (Co-PI), we designed an experiential learning capstone course focused on entrepreneurship for data analytics, where the students are challenged to solve a real-world problem by creating a "startup" in the data science space.

1.3.3 SERVICE and LEADERSHIP

I have served for over 15 years (2001-2016) as a higher education administrator working for the UCF Associate Vice-president for Research and Commercialization. In that role, I have managed more than \$2M of the annual operation budget and managed over 20 direct reports. In this capacity, I was part of the team that designed and implemented the growth strategy that resulted in the growth of extramural UCF research funding from \$30 million per year to \$150 million per year over 10 years and achieved the Carnegie Foundation designation of UCF as a Research I institution (very high research activity) in 2011. Part of this strategy was our focus on obtaining federal funding for research translation, innovation ecosystem building, and entrepreneurship. Another aspect of our strategy was the focused investment in research areas of strategic importance for UCF via the creation of centers of excellence. These centers of excellence support included the development and acceleration of existing centers and the creation of new centers and institutes dedicated to achieving excellence in areas of strategic importance.

I currently serve as the director of the Complex Adaptive System Laboratory ¹⁰. This laboratory attracts approximately \$2.0 million per year in research funding. During the last 8 years, it has employed approximately 35 researchers, including 4 assistant research professors, 8 postdoctoral fellows, 21 doctoral graduate students, and various faculty collaborators from UCF and other research institutions. I started this research laboratory in 2016 without startup funds. In addition, I serve on the faculty senate as a senator and on the editorial board of the Journal on Policy and Complex Systems.

I also serve as Co-Director of the *School of Technology, Leadership and Innovation* (STLI) ¹¹, a new UCF initiative launched in 2026 and coordinated by the College of Business in collaboration with the College of Engineering and Computer Science, under strategic oversight of the Provost's Office. STLI is designed to help technology-driven organizations convert technology investments into leadership capability, organizational performance, and innovation through custom executive education, professional credentials, applied research collaborations, data-driven solutions, and consulting engagements. The school draws faculty expertise from engineering, computer science, business, psychology, and related disciplines across UCF, with founding corporate partners including Addition Financial Credit Union and Siemens Energy.

I have demonstrated leadership and strategic planning in several national and university settings.

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¹⁰For more information on the Complex Adaptive Systems Laboratory see: <https://complexity.cecs.ucf.edu>

¹¹For more information on STLI see: <https://www.ucf.edu/news/ucf-launches-school-of-technology-leadership-and-innovation-to-help-organizations-turn-technology-into-performance/>

(a) Provide national leadership via congressional testimony to US Congress on the *Artificial Intelligence – Opportunities and Challenges Forum* organized by *The New Economy Task Force part of Jobs for America Task Forces*, invited by US Congressman Darren Soto. I represented institutions of higher education in a panel including industry leaders like Microsoft and others ¹².

(b) Providing national leadership on university engagement via NSF-funded research conducted in collaboration with the Association of Public and Land-grant Universities (APLU) on the project *Defining, Measuring, and Advancing University Economic Engagement: A Research Initiative for moving forward Science and Innovation Policy*.

(c) Contributed to the 2022 - 2027 UCF's Strategic Plan in national security, artificial intelligence, and quantum computing by direct request of Ron Piccolo, Professor of Management and Special Assistant to the President for Strategic Planning and the Strategic Planning Working Group lead.

(d) Leading the *UCF Big Data and Artificial Intelligence Initiative* ¹³, a precursor of the current UCF AI initiative, formed by the Vice-President for Research in 2020 to provide strategic leadership in these emerging areas in collaboration with industry partners. Among this initiative's activities, I created the *UCF COVID-19 Artificial Intelligence and Big Data (AI & BD) Initiative Seed Funding Program 2020-2021*. For this program, I secured \$175,000 of internal funding awarded to multiple internal projects across campus via a competition. ¹⁴.

(e) Co-chair of the Ad-hoc Committee on *UCF Strategic Investments on the Nexus of Artificial Intelligence and Quantum Computing* created by the Vice-President for Research's office). Together with my co-chair, Eduardo Mucciolo, Professor of Physics, we produced a report after meeting with UCF faculty and industry partners. Our recommendations included the creation of a faculty cluster on quantum information sciences and artificial intelligence that will develop into an Institute for Advanced Studies in Quantum Computing and Artificial Intelligence at UCF.

(f) Director of the Master of Science in Data Analytics ¹⁵. Created an industry advisory board of over 37 companies, including Amazon, Disney, Lockheed Martin, Duke, Nielsen, KPMG, IBM, Deloitte, Leidos, Siemens, and many others actively engaged in the strategic direction of this program, providing internships and a few research grants.

(g) Contributing to UCF's governance and planning as a UCF faculty senate senator and a voting member of the UCF Research Council.

(h) Contributing to Florida leadership in research translation as the founding director and Co-PI of the NSF-funded Innovation-Corps Sites program. Funded in 2014, it is the first I-Corps program in Florida and catalyzed the entire university to adopt evidence-based entrepreneurial education. UCF I-Corps has provided support to over 120 startup teams so far.

(i) Continued leadership in national research translation as the PI of the NSF-funded Accelerating Research Translation (ART) grant at UCF. This grant aims to expand UCF's capacity to generate technology startups and other vehicles to move technology from our

¹²<https://www.cs.ucf.edu/~garibay/PDFs/Congress-Garibay-Remarks-Artificial-Intelligence-Opportunities-and-Challenges%20.pdf>

¹³<https://www.ucf.edu/news/ucf-launches-new-artificial-intelligence-and-big-data-initiative/>

¹⁴<https://www.cecs.ucf.edu/grants-available-for-covid-19-research-that-uses-ai-and-big-data/>

¹⁵<https://www.ce.ucf.edu/Credit/Master-Data-Analytics/>

federally funded laboratories into the marketplace to maximize their societal impact. As part of this grant, I plan to create a new organization to support faculty startups: the *UCF Venture Lab*.

(j) Leading a national research-translation initiative as PI of the NSF-funded *National Commercialization and Translation Institute (NCTI) Pilot Program*, a \$20 million Cooperative Agreement (2026–2028) awarded by NSF’s Directorate for Technology, Innovation and Partnerships. NCTI conducts evaluative research on how to reliably move deep-technology R&D to commercial success: through a scored national open competition it selects six to eight NSF SBIR/STTR Phase II companies and funds them against verified milestones across five stages (SUPPORT, EDUCATE, ORIENT, CONNECT, and MODEL), with an external evaluator assessing impact. Co-PIs are Michael Georgiopoulos (Dean, College of Engineering and Computer Science), Thomas O’Neal, and Ronald Piccolo.

(k) Co-Director of the *School of Technology, Leadership and Innovation (STLI)* at the College of Business, since September 2025¹⁶. In this role, I have organized and led faculty idea sprints, solicited proposals, and conducted initial evaluations of over sixty submissions. Working closely with my co-director and program lead, I have shaped the first set of one-day and three-day workshops to ensure academic quality, cross-college alignment, and corporate relevance. I also provide ongoing strategic counsel as we define STLI’s direction, scope, and governance.

(l) Elected Associate Member of the *Academy of Science, Engineering and Medicine of Florida (ASEMFL)* in 2026¹⁷, the state of Florida’s counterpart to the National Academies. As a member, I contribute to academy committees, governance, and the organization of the Annual Meeting that convenes Florida’s leading scientists, engineers, and medical researchers. The election recognizes pioneering work in artificial intelligence for modeling complex human behavior, including the development of inverse generative social science, evolutionary model discovery, green technological innovation, and AI for social resilience against disinformation and polarization.

1.4 PROFESSIONAL EXPERIENCE

1.4.1 ACADEMIA

- **Professor**, August 2025-present, Industrial Engineering and Management Systems, University of Central Florida
- **Associate Professor**, August 2021 - 2025, Industrial Engineering and Management Systems, University of Central Florida
- **Assistant Professor**, August 2016 - August 2021, Industrial Engineering and Management Systems, University of Central Florida
- **Co-Director, School of Technology, Leadership and Innovation**, September 2025 - present, College of Business, University of Central Florida

¹⁶<https://www.ucf.edu/news/ucf-launches-school-of-technology-leadership-and-innovation-to-help-organizations-turn-technology-into-performance/>

¹⁷<https://www.asemfl.org/>

- **Director of Complex Adaptive Systems Laboratory**, November 2015 - present, Industrial Engineering and Management Systems, University of Central Florida
- **Director, Master of Science in Data Analytics**, October 2016 - present, College of Engineering and Computer Science, University of Central Florida
- **Joint Faculty, Computer Science**, January 2017 - present, Computer Science Department, University of Central Florida
- **Joint Faculty, Learning Sciences Cluster**, January 2018 - present, Learning Sciences Cluster Initiative, University of Central Florida
- **Assistant Research Professor**, June 2013 - October 2015, Institute for Simulation and Training, University of Central Florida
- **Joint Faculty**, 2012-2013, Institute for Simulation and Training, University of Central Florida
- **Joint Faculty**, 2006-2013, School (now Department) of Electrical Engineering and Computer Science, University of Central Florida.
- **Lecturer**, 1995-1997, Electronic Engineering Department, Ricardo Palma University.

1.4.2 INDUSTRY: HIGHER EDUCATION ADMINISTRATION

- **Director, Technology & Innovation and Chief Information Officer** Research & Commercialization Division, 2015-2016, University of Central Florida.
- **Director, Research Information Systems** and Chief Information Officer for the Research Division, 2009-2015, University of Central Florida.
- **Associate Director & Chief Information Officer**, 2006-2009, Office of Research and Commercialization, University of Central Florida.
- **Assistant Director**, 1996-1997, Computer Services and Informatics Office (Oficina Central de Informatica y Computo), Universidad Ricardo Palma.

2 TEACHING

2.1 COURSES

Course	Course Title	Cred.	Class	Semester	Stud.	SPI ¹⁸
CAI4823	Artificial Intelligence for IE	3	Senior	Fall 2025	109	4.80
ESI6535	Advanced Agent-Based Modeling	3	Grad	Spring 2025	4	TBD
CAI4823	Artificial Ingelligence for IE	3	Senior	Fall 2024	68	4.31

¹⁸Student Perception of Instruction (SPI), in a scale from 0 to 5 with 5 being the best.

ESI6535	Advanced Agent-Based Modeling	3	Grad	Spring 2024	7	4.67
ESI4628	Decisions Support Syst. for IE	3	Senior	Fall 2023	82	3.62
ESI6535	Advanced Agent-Based Modeling	3	Grad	Spring 23	9	4.33
ESI4628	Decision Support Systems (Data Science, AI/ML)	3	Senior	Fall 22	111	3.84
ESI6535	Advanced Agent-Based Modeling	3	Grad	Spring 22	5	4.56
ESI6535	Advanced Agent-Based Modeling	3	Grad	Spring 21	13	4.56
ESI6534	Advanced Agent-Based Modeling	3	Grad	Spring 20	17	4.46
ESI6938	Special Topics (Agent-Based Models, Artificial Intelligence and Machine Learning)	3	Senior	Spring 19	14	4.14
ESI4628	Decision Support Systems (Data Science, AI/ML)	3	Senior	Fall 18	111	3.70
ESI5531	Discrete Systems Simulation	3	Grad	Spring 17	12	3.88
ESI5531	Discrete Systems Simulation	3	Grad	Spring 17	5	3.33
ESI4628	Decision Support Systems	3	Senior	Fall 16	124	3.33
CAP6675	Complex Adaptive Systems	3	Grad	Fall 2012	12	N/A
CAP6675	Complex Adaptive Systems	3	Grad	Fall 2011	14	N/A
CAP5512	Evolutionary Computation	3	Grad	Spring 2007	15	N/A

2.2 RESEARCH AND DISSERTATION COURSES

Course	Course Title	Credits	Class	Semester	Students
EIN 7919-0003	RESEARCH	3	Grad	Spring 2026	1
EIN 7980-0003	DISSERTATION	3	Grad	Spring 2026	1
ESI 3933-0005	IE CAREER ADVISING	1	Senior	Spring 2026	5
EIN 7919-0003	RESEARCH	3	Grad	Fall 2025	2
CAP 7980-0027	DISSERTATION	3	Grad	Fall 2025	1
ESI 3933-0005	IE CAREER ADVISING	1	Senior	Fall 2025	6
EIN 7919-C003	RESEARCH	3	Grad	Summer 2025	1
CAP 7980-C027	DISSERTATION	3	Grad	Summer 2025	1
ESI 3933-0005	IE CAREER ADVISING	1	Senior	Spring 2025	4
EIN 7980-0003	DISSERTATION	3	Grad	Spring 2025	1
EIN 7919-0003	RESEARCH	3	Grad	Spring 2025	1
CAP 7980-0022	DISSERTATION	3	Grad	Spring 2025	1
ESI 3933-0005	IE CAREER ADVISING	1	Senior	Fall 2024	3
EIN 7980-0003	DISSERTATION	3	Grad	Fall 2024	1
EIN 7919-0003	RESEARCH	3	Grad	Fall 2024	1
EIN 6918-0057	DIRECTED RESEARCH	3	Grad	Fall 2024	1
EIN 7919 C003	RESEARCH	3	Grad	Summer 2024	1
EIN 7980-C003	DISSERTATION	3	Grad	Summer 2024	2
EIN 7919 0003	RESEARCH	3	Grad	Spring 2024	1

EIN 7980 0003	DISSERTATION	9	Grad	Spring 2024	3
CAP 7919 0023	RESEARCH	6	Grad	Fall 2023	1
EIN 6918 0057	DIRECTED RESEARCH	3	Grad	Fall 2023	2
EIN 7919 0003	RESEARCH	9	Grad	Fall 2023	3
EIN 7980 0003	DISSERTATION	12	Grad	Fall 2023	2
CAP 7919 0031	RESEARCH	3	Grad	Spring 2023	1
CAP 7980 0022	DISSERTATION	3	Grad	Spring 2023	1
EIN 7919 0003	RESEARCH	9	Grad	Spring 2023	3
EIN 7980 0003	DISSERTATION	3	Grad	Spring 2023	1
CAP 7919 C023	RESEARCH	6	Grad	Summer 2023	2
EIN 7919 C003	RESEARCH	6	Grad	Summer 2023	4
EIN 7980 C003	DISSERTATION	6	Grad	Summer 2023	1
CAP 7980 0027	DISSERTATION	3	Grad	Fall 2022	2
EIN 7919 0003	RESEARCH	9	Grad	Fall 2022	4
EIN 7980 0003	DISSERTATION	9	Grad	Fall 2022	1
CAP 6908 0022	INDEPENDENT STUDY	3	Grad	Spring 2022	1
CAP 7919 0030	RESEARCH	9	Grad	Spring 2022	1
CAP 7980 0025	DISSERTATION	9	Grad	Spring 2022	2
EIN 7919 0003	RESEARCH	9	Grad	Spring 2022	4
EIN 7980 0003	DISSERTATION	6	Grad	Spring 2022	3
CAP 6908 C020	INDEPENDENT STUDY	3	Grad	Summer 2022	1
CAP 7980 C027	DISSERTATION	3	Grad	Summer 2022	1
EIN 7919 C003	RESEARCH	6	Grad	Summer 2022	4
CAP 6908 0022	INDEPENDENT STUDY	3	Grad	Fall 2021	1
CAP 7919 0023	RESEARCH	6	Grad	Fall 2021	3
CAP 7980 0027	DISSERTATION	6	Grad	Fall 2021	1
EIN 7919 0003	RESEARCH	9	Grad	Fall 2021	3
EIN 7980 0003	DISSERTATION	9	Grad	Fall 2021	5
CAP 7919 0023	RESEARCH	9	Grad	Spring 2021	4
EIN 6971 0003	THESIS	3	Grad	Spring 2021	1
EIN 7919 0003	RESEARCH	9	Grad	Spring 2021	9
EIN 7980 0003	DISSERTATION	9	Grad	Spring 2021	1
CAP 6908 C020	INDEPENDENT STUDY	6	Grad	Summer 2021	1
CAP 7919 C023	RESEARCH	6	Grad	Summer 2021	3
EIN 7919 C003	RESEARCH	6	Grad	Summer 2021	5
EIN 7980 C003	DISSERTATION	6	Grad	Summer 2021	4
CAP 4912 0006	RESEARCH	1	Grad	Fall 2020	4
CAP 7919 0023	RESEARCH	9	Grad	Fall 2020	3
EIN 7919 0003	RESEARCH	9	Grad	Fall 2020	9
CAP 7919 0024	RESEARCH	6	Grad	Spring 2020	2
CNT 7919 0007	DOCTORAL RESEARCH	3	Grad	Spring 2020	1
EIN 6918 0057	DIRECTED RESEARCH	3	Grad	Spring 2020	6
EIN 7919 0003	RESEARCH	6	Grad	Spring 2020	6
EIN 7980 0003	DISSERTATION	6	Grad	Spring 2020	1
STA 6918 0057	DIRECTED RESEARCH	3	Grad	Spring 2020	1

CAP 7919 C023	RESEARCH	6	Grad	Summer 2020	3
EIN 7919 C003	RESEARCH	6	Grad	Summer 2020	10
CAP 6908 0003	INDEPENDENT STUDY	3	Grad	Fall 2019	1
CAP 7919 0023	RESEARCH	6	Grad	Fall 2019	2
EIN 6918 0057	DIRECTED RESEARCH	3	Grad	Fall 2019	6
EIN 7919 0003	RESEARCH	9	Grad	Fall 2019	10
EIN 7980 0003	DISSERTATION	9	Grad	Fall 2019	2
STA 6918 0057	DIRECTED RESEARCH	3	Grad	Fall 2019	3
CAP 6918 0023	DIRECTED RESEARCH	3	Grad	Spring 2019	1
CAP 7919 0025	RESEARCH	6	Grad	Spring 2019	3
EIN 6918 0057	DIRECTED RESEARCH	3	Grad	Spring 2019	3
EIN 7919 0003	RESEARCH	6	Grad	Spring 2019	11
EIN 7980 0003	DISSERTATION	3	Grad	Spring 2019	1
CAP 6908 C020	INDEPENDENT STUDY	6	Grad	Summer 2019	3
CAP 7919 C023	RESEARCH	6	Grad	Summer 2019	1
EIN 7919 C003	RESEARCH	6	Grad	Summer 2019	10
EIN 7980 C003	DISSERTATION	3	Grad	Summer 2019	1
STA 6918 C057	DIRECTED RESEARCH	3	Grad	Summer 2019	5
CAP 7919 0023	RESEARCH	3	Grad	Fall 2018	4
EIN 6918 0057	DIRECTED RESEARCH	3	Grad	Fall 2018	3
EIN 7919 0003	RESEARCH	9	Grad	Fall 2018	10
EIN 7980 0003	DISSERTATION	3	Grad	Fall 2018	1
EIN 6918 0001	DIRECTED RESEARCH	3	Grad	Spring 2018	2
EIN 7919 0003	RESEARCH	9	Grad	Spring 2018	7
EIN 7980 0003	DISSERTATION	9	Grad	Spring 2018	1
CAP 7919 C023	RESEARCH	6	Grad	Summer 2018	1
EIN 6918 C001	DIRECTED RESEARCH	3	Grad	Summer 2018	1
EIN 7919 C003	RESEARCH	6	Grad	Summer 2018	6
EIN 7980 C003	DISSERTATION	6	Grad	Summer 2018	1
EIN 4912 0001	RESEARCH	0	Grad	Fall 2017	1
EIN 6918 0001	DIRECTED RESEARCH	3	Grad	Fall 2017	2
EIN 7919 0003	RESEARCH	9	Grad	Fall 2017	6
MCB 4912 0102	RESEARCH	3	Grad	Fall 2017	1
EIN 6918 0059	DIRECTED RESEARCH	3	Grad	Spring 2017	2
EIN 7919 0018	RESEARCH	9	Grad	Spring 2017	3
EIN 7919 C003	RESEARCH	6	Grad	Summer 2017	2
MCB 4912 C049	RESEARCH	3	Grad	Summer 2017	2
EIN 6918 0001	DIRECTED RESEARCH	3	Grad	Fall 2016	1
EIN 7919 0019	RESEARCH	9	Grad	Fall 2016	3
IDS 6908 0001	INDEPENDENT STUDY	3	Grad	Spring 2016	1
IDS 7919 0022	DOCTORAL RESEARCH	3	Grad	Spring 2016	1
IDS 7919 C018	DOCTORAL RESEARCH	6	Grad	Summer 2016	1
IDS 6908 0005	INDEPENDENT STUDY	3	Grad	Fall 2015	1
IDS 6908 C004	INDEPENDENT STUDY	3	Grad	Summer 2015	2

2.3 MAJOR ADVISOR FOR Ph.D. DISSERTATIONS

2.3.1 COMPLETED

1. **Chathika Gunaratne, Ph.D. in Modeling and Simulation, Fall 2019.** I served as his major academic advisor for his dissertation work.
 - Source of support: federal grant (DARPA).
 - Dissertation title: “EVOLUTIONARY MODEL DISCOVERY: AUTOMATING CAUSAL INFERENCE FOR GENERATIVE MODELS OF HUMAN SOCIAL BEHAVIOR”
 - Present position: META.
 - Previous positions: Research Scientist, Learning Systems Group at Oak Ridge National Laboratory; Visiting Scholar at Massachusetts Institute of Technology (MIT), Computer Science and Artificial Intelligence Lab (CSAIL).
2. **Prateek Basavaraj, Ph.D. in Industrial Engineering, Spring 2020.** I served as his major academic advisor for his dissertation work.
 - Source of support: state grant (Florida University System, Board of Governors)
 - Dissertation title: “UTILIZING INSTITUTIONAL DATA FOR CURRICULUM ENHANCEMENT TO IMPROVE STUDENT SUCCESS IN UNDERGRADUATE COMPUTING PROGRAMS”
 - Present position: Data Scientist at the American Association of State Colleges and Universities, Washington DC.
3. **Milad Talebzadehhosseini, Ph.D. Industrial Engineering, Fall 2021.** I served as his major academic advisor for his dissertation work.
 - Source of support: National Science Foundation and Industry grant (DISNEY).
 - Dissertation title: “INVESTIGATING THE INTERACTION EFFECTS OF GREEN PRODUCT DEVELOPMENT AND COUNTRIES GREEN GROWTH PERFORMANCE: ECONOMIC COMPLEXITY PERSPECTIVE”
 - Present position: Assistant Professor, University of Northern Colorado
4. **Marie Alaghband, Ph.D. in Industrial Engineering, Fall 2021.** I served as his major academic advisor for his dissertation work.
 - Source of support: TA.
 - Dissertation title: “ANALYSIS OF SIGN LANGUAGE FACIAL EXPRESSIONS AND DEAF STUDENTS’ RETENTION USING MACHINE LEARNING AND AGENT-BASED MODELING”

- Present position: Artificial Intelligence Researcher, VaxCare Corporation, Orlando FL.
5. **NISHA BARAL, Ph.D. in Industrial Engineering and Management Systems, Spring 2022.** I served as his major academic advisor for his dissertation work.
 - Source of support: federal grant (DARPA).
 - Dissertation title: “INVESTIGATING THE EFFECTS OF NEGATIVE INFLUENCE GRADIENTS AND EMOTION CONTAGION ON THE INFORMATION PROCESSING CAPACITY OF SOCIAL MEDIA USERS: INFORMATION DIFFUSION MODELING APPROACH”
 - Present position: Researcher at the University of Illinois Urbana-Champaign.
 6. **CHATHURANI SENEVIRATHNA, Ph.D. in Industrial Engineering and Management Systems, Spring 2022.** I served as his major academic advisor for his dissertation work.
 - Source of support: federal grant (DARPA).
 - Dissertation title: “NOT ALL INFLUENCE IS BORN EQUAL: ON THE EFFECTS OF VARIOUS TYPES OF BEHAVIORAL INFLUENCE RELATIONSHIPS ON SOCIAL MEDIA”
 - Present position: Post-Doctoral CASL.
 7. **Ramya Akula, Ph.D. in Computer Science, Fall 2022.** I served as his major academic advisor for his dissertation work.
 - Source of support: federal grant (DARPA).
 - Dissertation title: “Toxic & Figurative Language Detection and Evaluation Metric for Abstractive and Extractive Summarization in Social Media Content”
 - Present position: Researcher at Ohio State University.
 - Previous position: Machine Learning Lecturer, MS in FinTech, UCF.
 8. **Toktam Oghaz, Ph.D. in Computer Science, Fall 2023.** I served as his major academic advisor for his dissertation work.
 - Source of support: federal grant (DARPA).
 - Dissertation title: “Low-Resource Machine Learning Techniques for the Analysis of Online Social Media Textual Data ”
 - Present position: AI Startup.
 9. **Jasser Jasser, Ph.D. in Computer Science, Spring 2023.** I served as his major academic advisor for his dissertation work.
 - Source of support: federal grant (DARPA).

- Dissertation title: “Identification and Modeling Social Media Influence Pathways: a Characterization of a Disinformation Campaign Using the Flooding-the-zone Strategy via Transfer Entropy”
 - Present position: Assistant Professor in Data Science, Rollings College.
10. **Bruce Miller, Ph.D. in Industrial Engineering, Fall 2023.** I served as his major academic advisor for his dissertation work.
- Source of support: industry grant (DISNEY) and a federal grant (DARPA).
 - Dissertation title: “UNDERSTANDING OUTGROUP AVERSION EFFECTS ON INNOVATION ADOPTION AND POLARIZATION IN NETWORK ENVIRONMENTS”
 - Present position: Manager, Disney.
11. **Chathura Jayalath, Ph.D. in Industrial Engineering, Spring 2024.** I served as his major academic advisor for his dissertation work.
- Source of support: federal grant (DARPA).
 - Dissertation title: “MODELS OF INFORMATION DIFFUSION AND THE ROLE OF INFLUENCE”
 - Present position: Post-Doctoral CASL.
12. **Hanin Alhaddad, Ph.D. in Industrial Engineering, Summer 2024.** I served as his major academic advisor for his dissertation work.
- Source of support: UCF Office of Sponsored Research .
 - Dissertation title: “INVESTIGATING THE EFFECT OF TECHNOLOGICAL INNOVATION ON DEVELOPING COUNTRIES’ GREEN PRODUCTION CAPABILITIES EVOLUTION AND SPILLOVER”
 - Present position: Research Developer, UCF Office of Sponsored Research.
13. **Clayton Barham, Ph.D. in Industrial Engineering, Fall 2025.** I served as his major academic advisor for his dissertation work.
- Source of support: federal grant (DARPA) and MSDA TA.
 - Dissertation title: “EXAMINING INFORMATION FLOWS WITHIN TRANSFORMER MODELS USING TRANSFER ENTROPY”
 - Present position: Volunteer Researcher, Complex Adaptive Systems Laboratory, UCF.

2.3.2 IN PROGRESS

1. **Sina Abdidizaji, Ph.D. in Industrial Engineering, expected graduation Fall 2026.** Ph.D. dissertation major advisor. Source of support: federal grant (DARPA) and MSDA TA. Dissertation title: “Disinformation dynamics using agent-based models and large language models”.
2. **Michael Brown, Ph.D. in Modeling and Simulation, expected graduation Fall 2029.** Ph.D. dissertation major advisor. Source of support: federal grant (NSF ART) and MSDA TA. Dissertation title: “TBD”.
3. **Siddhi Kanta Mishra, Ph.D. in Industrial Engineering, expected graduation Fall 2029.** Ph.D. dissertation major advisor. Source of support: MSDA TA. Dissertation title: “TBD”.

2.4 MAJOR ADVISOR FOR POST-DOCTORAL SCHOLARS

1. **Spencer Lyon, Ph.D. in Economics, NYU, 2016-2022.** I was the main mentor of this postdoctoral student. Previous advisor at New York University: **Thomas J. Sargent, Nobel Memorial Prize in Economics, 2011.**
 - Source of support: industry grant (Disney).
 - Area of research: Macroeconomics, Big Data, Deep Learning, Complexity Economics
 - Present position: Lecturer at the Master of Science in Data Analytics program at UCF and Scientist at DataValorum (Data Science Startup)
2. **Niloofer Yousefi, Ph.D. in Industrial Engineering, UCF, 2016-2022.** I was the main mentor of this postdoctoral student.
 - Source of support: industry grant (Royal Bank of Canada), federal grant (DARPA).
 - Area of research: Machine Learning, Transfer Learning, Excess Risk Bounds, Deep Learning, Cyber Security.
 - Present position: Tenure-earning Assistant Professor on Industrial Engineering and Management Systems at UCF.
3. **Kuldip, Ph.D. in Computer Science, UCF, 2018-2021.** I am the main mentor of this postdoctoral student.
 - Source of support: federal grant (DARPA).
 - Area of research: information diffusion models, network science for social media networks, agent-based models with REPAST-HPC.
 - Present position: Postdoctoral Fellow at the Complex Adaptive Systems Laboratory at UCF.
4. **Chathika Gunaratne, Ph.D. in Modeling and Simulation, UCF, 2019-2020.** I am the main mentor of this postdoctoral student.

- Source of support: federal grant (DARPA).
 - Area of research: information diffusion models, agent-based models, inverse generative social science.
 - Present position: Researcher, Oak Ridge National Laboratory.
5. **Milad Talebzadehhosseini, Ph.D. Industrial Engineering, UCF, 2020-2021.** I am the main mentor of this postdoctoral student.
- Source of support: National Science Foundation and Industry grant (DISNEY).
 - Area of research: green economy, innovation, network science.
 - Present position: Tenure-earning Assistant Professor, University of Northern Colorado
6. **CHATHURANI SENEVIRATHNA, Ph.D. in Industrial Engineering and Management Systems, UCF , 2022-2023.** I am the main mentor of this postdoctoral student.
- Source of support: federal grant (DARPA).
 - Area of research: influence networks in social media.
 - Present position: Post-Doctoral CASL.
7. **Jasser Jasser, Ph.D. in Computer Science, UCF, 2023-2024.** I am the main mentor of this postdoctoral student.
- Source of support: federal grant (DARPA).
 - Area of research: disinformation and influence networks in social media
 - Present position: Assistant Professor at Rollings College, Data Science Department.
8. **Chathura Jayalath, Ph.D. in Computer Science, UCF, 2024-present.** I am the main mentor of this postdoctoral student.
- Source of support: Master of Science in Data Analytics fellows program.
 - Area of research: machine learning, disinformation, and influence networks in social media.
 - Present position: Post-Doctoral CASL.

2.5 MENTOR FOR GRADUATE RESEARCHERS (MASTERS)

1. **Gehan Velivitiya, 2023 - present, *Graduate Researcher*** at the Complex Adaptive Systems Laboratory. Major: Data Analytics. Projects:
- Agent-based models and foundational deep learning models for social media information spread.

2.6 MENTOR FOR UNDERGRADUATE RESEARCHERS

1. **Courtney Astore**, 2017 - 2018, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Biotechnology and Biomedical Sciences. Projects:
 - A computational and genomic analysis of the epidemiological challenges associated with developing Influenza vaccines using system dynamics, presented at the UCF 2017 Undergraduate Research Showcase.
 - An agent-based model to study the effects of epidemiological factors on three common influenza strain's virulence, presented at In the Computational Social Sciences conference (CSS). Poster Session, Santa Fe, NM.
2. **Lydia Borah**, 2017 - 2018, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Biotechnology and Biomedical Sciences. Projects:
 - A computational and genomic analysis of the epidemiological challenges associated with developing Influenza vaccines using system dynamics, presented at the UCF 2017 Undergraduate Research Showcase.
 - An agent-based model to study the effects of epidemiological factors on three common influenza strain's virulence, presented at In the Computational Social Sciences conference (CSS). Poster Session, Santa Fe, NM.
3. **Kevin Torres**, 2017 - 2018, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Biotechnology and Biomedical Sciences. Projects:
 - A computational and genomic analysis of the epidemiological challenges associated with developing Influenza vaccines using system dynamics, presented at the UCF 2017 Undergraduate Research Showcase.
 - An agent-based model to study the effects of epidemiological factors on three common influenza strain's virulence, presented at In the Computational Social Sciences conference (CSS). Poster Session, Santa Fe, NM.
4. **Killian Muollo**, 2017 - 2018, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Mathematics. Projects:
 - Pegasus: Big data analytics for improving higher education outcomes
 - Understanding students' online reviews to improve college experience and graduation rates of stem programs. Presented at 2018 IEEE Frontiers in Education Conference.
5. **Madeira Mas**, 2017 - 2018, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Statistics. Projects:
 - Big Data for Zika Epidemic Computational Modeling
6. **Ashley Voglewede**, 2019 - 2022, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:

- Amazon AWS Robot Internship Program
 - DARPA - Artificial Social Intelligence for Successful Teams, data collection and analysis.
7. **Jose Johnson**, 2020 - 2022, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
 - DARPA - Artificial Social Intelligence for Successful Teams, data collection and analysis.
 8. **Dianneth Murillo**, 2020 - 2022, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
 - DARPA - Artificial Social Intelligence for Successful Teams, data collection and analysis.
 9. **Jeremy Bensusan**, 2020 - 2022, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
 - DARPA - Artificial Social Intelligence for Successful Teams, design of experiments for UCF data collection.
 10. **Jackson Trudel**, 2020 - 2022, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
 - DARPA - Artificial Social Intelligence for Successful Teams, language understanding for human-AI teamwork.
 11. **Liam Kenney**, 2020 - 2022, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
 - DARPA - Artificial Social Intelligence for Successful Teams, design of experiments for UCF data collection.
 12. **Kirsten Wright**, 2020 - 2022, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
 - DARPA - Artificial Social Intelligence for Successful Teams, literature review.
 13. **Weiyi Chen**, 2020 - 2022, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
 - DARPA - Artificial Social Intelligence for Successful Teams, literature review.
 14. **Sarah Whitfield**, 2023, *Undergraduate Teaching Assistant* at the Complex Adaptive Systems Laboratory. Major: Industrial Engineering. Projects:
 - Artificial Intelligence for Industrial Engineers course development.

15. **Grace Trout Murillo**, 2023, *Undergraduate Teaching Assistant* at the Complex Adaptive Systems Laboratory. Major: Industrial Engineering. Projects:
 - Artificial Intelligence for Industrial Engineers course development.
16. **Francisco Canova**, 2025, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Industrial Engineering. Projects:
 - NSF’s National Deep Inference Fabric: crack open the mysteries inside large-scale Artificial Intelligence systems (Large Language Models).
17. **Jayson Srouji**, 2025, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Industrial Engineering. Projects:
 - NSF’s National Deep Inference Fabric: crack open the mysteries inside large-scale Artificial Intelligence systems (Large Language Models).
18. **Connor Whitenton**, 2025, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Industrial Engineering. Projects:
 - NSF’s National Deep Inference Fabric: crack open the mysteries inside large-scale Artificial Intelligence systems (Large Language Models).
19. **Misael Castellanos Valido**, 2025, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Industrial Engineering. Projects:
 - NSF’s National Deep Inference Fabric: crack open the mysteries inside large-scale Artificial Intelligence systems (Large Language Models).
20. **Timothy Mcallister**, 2025 - 2026, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
 - “Smarter Saboteurs, Better Fixers,” paper draft for ICML 2026 Workshop.
 - “Judgment Under the Influence: How Location and Sociodemographic Signals in Prompts Alter LLM Decisions in Offensive and Figurative Language Detection,” AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES).
21. **Selin Yilmaz**, 2025 - present, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Industrial Engineering. Projects:
 - Supported nanobubble (gas-filled bubbles under 1,000 nm used in cancer treatment, stroke patients, and lake restoration) literature review by screening 100+ research papers for relevance and methodology.
22. **Jacob Salman**, 2025 - present, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:

- Physics-Informed Neural Networks (PINN) and Convolutional Neural Networks (CNN) for inverse generative social science. Initially explored PINNs but switched to CNNs because PINNs required more domain theory while CNNs were significantly easier to apply in this context.
 - Reviewing Large Language Model (LLM) literature.
23. **Yihan Wang**, 2025 - present, *Undergraduate Researcher* at the Complex Adaptive Systems Laboratory. Major: Computer Science. Projects:
- Learning to use Convolutional Neural Networks (CNN), supporting Large Language Model (LLM) fine-tuning, and data processing pipelines. Provided technical support to multiple MSDA capstone groups using this knowledge.
 - Reviewing literature on classical complex systems, including agent-based models (ABMs).

2.7 EDUCATIONAL CONTRIBUTIONS

2.7.1 NEW DEGREE PROGRAM DEVELOPMENT: MASTER OF SCIENCE IN DATA ANALYTICS, 2016-present

- Master of Science in Data Analytics (MSDA)
 - Approximately \$1.2M/year in income to College of Engineering and Computer Science
 - Graduated 240 students so far
 - 8 MSDA Graduate Classes, years 2018-2025
- MSDA Accreditation and Assessment Work. In collaboration with Associate Director Dr. Dan Eilen, leading the state-mandated Academic Program Review scheduled for 2026–2027 (conducted every four years), covering both undergraduate and graduate programs, with support from the Computer Science Chair and UCF's Academic Program Quality (APQ) Office. Annually, prepare the MSDA assessment reports and prior-year performance reviews required by the UCF Academic Affairs Office and the Graduate Performance and Assessment Committee (GPAC).
- Master of Science in Data Analytics (MSDA) curriculum development. As the program director, I have created the initial offering and substantially and continuously revised the courses in collaboration with the faculty teaching them and the industry advisory board for the program to maintain the program current and focus on meeting industry needs.
- Curriculum developed includes the following courses:
 - Network Science
 - Statistical Analysis
 - Parallel and Cloud Computation

- Text Mining I
 - Data Preparation
 - Computational Analysis of Social Complexity
 - Machine Learning
 - Data Mining Methodology I & II
 - Social Media and Network Analysis Interactive Data Visualization
 - Machine Learning Methods for Bioinformatics Data
 - Parallel and Distributed Databases
 - Project in Data Analytics
- MSDA program capstone course development. In collaboration with the MSDA industry advisory board, I have developed the capstone course: “Lean Big: Using Lean Methods in Entrepreneurship and Intrapreneurship on Big Data Analytics”. This capstone course has been taught twice a year (Fall and Spring) since the Spring of 2018.
 - MSDA internship and co-op program development. In collaboration with the MSDA industry advisory board subcommittee on internships and co-ops, I have developed a comprehensive and innovative internship program for all MSDA students.
 - Co-Taught MSDA Capstone: Spring 2018, Fall 2018, and Spring 2019.

2.7.2 NEW GRADUATE PROGRAM DEVELOPMENT: MSDA’s Artificial Intelligence (AI) Track, 2024-present

New track to be introduced in Fall 2024. This track adds 3 AI courses to the MSDA program for graduate students with a concentration on AI and machine learning skills.

- I am leading a team that is currently co-developing the curriculum for the AI-track courses, including:
 - Current Topics in Machine Learning (Machine Learning 2)
 - CAP 6640 Computer Understanding of Natural Language
 - CAP 5636 Advanced Artificial Intelligence
 - ESI 6942 Human-Centered AI - Capstone

2.7.3 NEW GRADUATE PROGRAM DEVELOPMENT: DEEP LEARNING FOR LASTING INNOVATION, 2018-2020.

This program was developed under Disney’s sponsorship. It educated two cohorts of Disney technical employees in deep learning and innovation concepts, resulting in deep learning innovations adopted by Disney corporate.

- As the PI of this effort, I have co-developed the curriculum for the following courses:

- Introduction to Machine Learning
- Deep Learning I
- Deep Learning II
- Capstone on Deep Learning: Lean Launchpad (I-Corps)

2.7.4 CURRICULA DEVELOPMENT: ENTREPRENEURSHIP COURSES, 2014-2020

Under the National Science Foundation Innovation-Corps (I-Corps) Program:

As part of the NSF-funded grant: “University of Central Florida I-Corps Sites Program: Enhancing Technology Commercialization to Develop a World-Class Innovation Ecosystem (ID: 1055907)”, co-developed and co-taught various specialized versions of the “UCF I-Corp: Evidence-Based Entrepreneurship” class:

1. MSDA Capstone I-Corps: The Lean Big - Evidence-Based Entrepreneurship for Big Data Applications (co-taught with Ozlem Garibay, Oscar Rodriguez, and Thomas O’Neal) Spring 2019
2. MSDA Capstone I-Corps: The Lean Big - Evidence-Based Entrepreneurship for Big Data Applications (co-taught with Ozlem Garibay and Edwin Nassiff) Fall 2018
3. UCF I-Corps: The Lean LaunchPad - Evidence-Based Entrepreneurship (co-taught with Oscar Rodriguez, Thomas O’Neal) Spring 2018
4. MSDA Capstone I-Corps: The Lean Big - Evidence-Based Entrepreneurship for Big Data Applications (co-taught with Ozlem Garibay, Oscar Rodriguez, Thomas O’Neal) Spring 2018
5. UCF I-Corps: The Lean LaunchPad - Evidence-Based Entrepreneurship (co-taught with Oscar Rodriguez, Michael O’Donnell , Thomas O’Neal, David Metcalf) Fall 2016
6. UCF I-Corps: The Lean LaunchPad - Incubator workshop (co-taught with Oscar Rodriguez) Summer 2016
7. UCF I-Corps: The Lean LaunchPad - Evidence-Based Entrepreneurship (co-taught with Oscar Rodriguez, Thomas O’Neal, David Metcalf) Spring 2016
8. UCF I-Corps: The Lean LaunchPad - Evidence-Based Entrepreneurship (co-taught with Thomas O’Neal, Oscar Rodriguez, Michael O’Donnell, David Metcalf, Cameron Ford) Fall 2015
 - revised the curriculum , developed “Talking to Humans” module based on *Talking to Humans: Success Starts with Understanding Your Customers* by Giff Constable, et.al.
9. UCF I-Corps: The Lean LaunchPad - Evidence Based Entrepreneurship (co-taught with Jerry Engel (Berkeley), Thomas O’Neal, Oscar Rodriguez, Michael O’Donnell, David Metcalf, Cameron Ford) Spring 2015

- Secured Jerry Engel, co-creator of the methodology and NSF National Faculty Director for the I-Corps program, to inaugurate and to co-teach the inaugural UCF I-Corps class
- Secured National Science Foundation I-Corps Faculty accreditation for the entire UCF teaching team
- Adapted curriculum from *Lean LaunchPad: Evidence Based Entrepreneurship Educators Guide* by Steve Blank (Stanford), Jerry Engel (Berkeley) and Jim Hornthal (Princeton)
- Course offered to selected teams of Florida faculty, students, and mentors
- Textbooks: *Startup Owner's Manual* by Blanks and Dorf, *Business Model Generation* by Osterwalder, et.al.

I-Corps classes are taught as part of the NSF Funded Effort: "UCF I-Corps Site: enhancing technology commercialization to develop a world-class innovation ecosystem"

2.7.5 CURRICULA DEVELOPMENT: GRADUATE COURSES

Developed new curricula for the following courses:

- **ESI 5000: Introduction to Artificial Intelligence for Industrial Engineers (2024)**, a new course created. This course teaches introductory topics on artificial intelligence, including Python and machine learning for engineering applications. Industrial Engineering and Management Systems, UCF, Fall 2024.
 - Textbook: Christopher M. Bishop and Hugh Bishop (2023). *Deep Learning: Foundations and Concepts*, Springer Nature, Switzerland, ISBN 978-3031454677
 - Support textbook: Andriy Burkov (2020). *Machine Learning Engineering*, True Positive Inc., USA. ISBN 978-1-9995795-7-9
- **ESI 6000: Advanced Artificial Intelligence for Industrial Engineers (2024)**, a new course created. This course teaches advanced topics on artificial intelligence, including Python and machine learning for engineering applications. Industrial Engineering and Management Systems, UCF, Fall 2024.
 - Textbook: Kevin P. Murphy (2023). *Probabilistic Machine Learning: Advanced Topics*, MIT Press, USA. ISBN 978-0262048439
 - Support textbook: Osvaldo Simeone (2022). *Machine Learning for Engineers*, Cambridge University Press, UK. ISBN 978-1-316-51282-1
- **ESI6938: Special Topics (2019)**, convergence of agent-based modeling, artificial intelligence, data science, and social networks analytics. Industrial Engineering and Management Systems, UCF, Spring 2019.
 - Created new curricula to teach graduate students how to successfully conduct research in Agent-Based Modeling, Artificial Intelligence, Machine Learning, Big Data, and Complex Systems to publish their work.

- Created original educational methodology to teach students to conduct publishable research: *The Research Canvas*
- **ESI6534: Agent-Based Modeling of Social Systems (2018-present)**, using machine learning and data science for modeling and simulation of social systems. Industrial Engineering and Management Systems, UCF, Fall 2018.
 - Created a new course.
- **ESI6535: Advanced Agent-Based Modeling (2018-present)**, advance topics and research project. Industrial Engineering and Management Systems, UCF, Fall 2018
 - Created a new course.
- **Agent-Based Simulation for Innovation Ecosystems (2015)**, modeling and simulation of economic systems with an emphasis on technological innovation and economic growth, UCF, Fall 2015
 - IDS6908. Directed Independent Study.
- **Simulating Innovation (2015)**, Modeling and Simulation, UCF, Summer 2015
 - IDS6908. Directed Independent Study. Textbooks: *Simulating Innovation: Computer-based Tools for Rethinking Innovation* by Christopher Watts and Nigel Gilbert.
- **Complex Adaptive Systems (2012)**, Computer Science, UCF, Fall 2012
 - CAP6675. Adjusted curriculum.
- **Complex Adaptive Systems (2011)**, Computer Science, UCF, Fall 2011
 - CAP6675. Developed a new curriculum. Textbooks: *Complexity: A guided Tour* by Melanie Mitchell, *Complex and Adaptive Dynamical Systems* by Claudius Gros, and *The Computational Beauty of Nature: Computer Explorations of Fractals, Chaos, Complex Systems, and Adaptation* by Gary William Flake.
- **Evolutionary Computation (2007)**, Computer Science, UCF, Spring 2007
 - CAP5512. Developed a new curriculum. Textbook: *Evolutionary Computation: A Unified Approach* by K. De Jong.

2.7.6 CURRICULA DEVELOPMENT: UNDERGRADUATE INSTRUCTION

- **ESI 4628: Artificial Intelligence for Industrial Engineers (2024)**, a new course was created. It introduces artificial intelligence and machine learning topics with Python's hands-on programming of solutions to engineering problems. Industrial Engineering and Management Systems, UCF, Fall 2024.
 - Github page with course material: <https://github.com/igaribay/DSSwithPython>.

- Textbook: Aurélien Géron (2019). Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 2nd Edition, O'Reilly Media Inc, USA. ISBN: 978-1-492-03264-9.
- **ESI 4628: Introduction to Data Science (Decision Support Systems) (2018-2023)**, Industrial Engineering and Management Systems, UCF, Fall 2018
 - Created a completely new curriculum to teach introduction to data science using Python
 - Created instructional materials (Jupyter Notebooks) publicly available on GitHub at <https://github.com/igaribay/DSSwithPython>
 - Main textbook: Laura Igual and Santi Seguí, (2017). Introduction to Data Science: A Python Approach to Concepts, Techniques and Applications, Undergraduate Topics in Computer Science, Springer International Publishing, Switzerland. ISBN: 978-3-319-50016-4.

3 RESEARCH INTEREST

3.1 KEY WORDS

Artificial Intelligence, Molecular Machine Learning, Large Language Model Architectures, AI Co-Scientists, Multiagent LLMs, mRNA Foundation Models, Biological Foundation Models, computational social sciences, deep learning, foundation models, large language models, complex systems, agent-based modeling and simulation, information diffusion, information and misinformation dynamics in social media, cognitive cybersecurity, data analytics, complexity economics, network science, social network analysis, evolutionary computation, multi-agent systems, self-organizing systems, innovation ecosystems, innovation-driven economic growth, entrepreneurship support organizations, entrepreneurship education, and STEM education.

3.2 RESEARCH AREA

My primary research area is the application of artificial intelligence to advance the cure and eradication of human disease. This vision spans the development of biomolecular foundation models for DNA, RNA, mRNA, and proteins; the design of AI co-scientists that partner with human researchers to accelerate hypothesis generation, experimental design, and discovery; the application of multi-agent large language model systems to drug discovery, target identification, and clinical decision support; and the de-novo design of therapeutic proteins. The unifying objective is to leverage recent state-of-the-art advances in generative and equivariant AI to translate biological complexity into clinical impact at unprecedented speed.

To realize this vision, my Complex Adaptive Systems Laboratory is developing a family of genomic and biomolecular foundation models. Our current flagship effort, *AltmanRNA*, is a state-of-the-art codon-level foundation model for mRNA and genomic sequences that integrates three innovations developed in parallel within our group: *OIL* (Omics Integrated Library), the largest codon-level pre-training corpus assembled to date (approximately 150–500 million sequences drawn from the OpenMetaGenome collection); *LAMP*, a multi-scale

selective state-space architecture with learned hierarchical routing tailored to the multi-scale structure of genomic data; and *Equi-mRNA*, the first codon-symmetry-respecting embedding that maps the 64-codon vocabulary onto $SO(2)$ so that synonymous-codon substitutions act as rotations of the embedding. This program is complemented by a filed patent on *Protein Translation Equivariant Encoding for mRNA Language Models* and by submissions to NSF and NIH to fund the broader research program (*Equi-mRNA: A Genetic-Code-Equivariant Foundation Model and AI Co-Scientist for mRNA Therapeutic Design*).

My secondary research area is human behavioral modeling using complex systems with an inherent interdisciplinary emphasis. I have taken a leadership role in developing the field of inverse generative social sciences, a synthesis of artificial intelligence, complex systems, data science, and agent-based modeling of human social behavior; the goal is to leverage vast computational power and large human-behavior data sets to create cognitive-theory-guided models of social behavior, developing cognitive and behavioral theories at various scales alongside the computational models, methods, and algorithms that realize them. This program is complemented by research on the design and implementation of models of information spread and evolution on social media, drawing from network science (polarization, influence), information theory (entropy metrics of social influence), cognitive psychology (human factors that modulate information spread), and epistemology (truth as a social construct). To analyze misinformation, we have developed novel models of conversation and narratives that capture amplification and dampening by organic users and malicious actors (bots and trolls), and we use these models to analyze and counter misinformation, polarization, and radicalization.

3.3 PUBLICATIONS

I publish with a network of collaborators and with all my student advisees:

- (*) indicates postdoctoral, graduate, or undergraduate student conducting research under my direct supervision
- (**) indicates a collaborator working on a funded project for which I am the principal investigator or research faculty employed by the laboratory I direct
- (++) indicates a graduate student working under the direct supervision of a collaborator funded by a grant for which I am the principal investigator on topics in support of the grant's main idea.
- (+) indicates the corresponding author

3.3.1 REFEREED CHAPTERS AND EDITED BOOKS

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3. Hossain, E., Ibna Basher, M. J., **Garibay, I.**, Garibay, O., and Yousefi(*), N. (2026a). When policies cannot be retrained: A unified closed-form view of post-training steering in offline reinforcement learning. In *Advances in Neural Information Processing Systems 39 (NeurIPS 2026), Main Track*. Accepted (Poster), NeurIPS 2026 Main Track. Preprint arXiv:2604.22873. <https://arxiv.org/abs/2604.22873>
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3.3.4 REFEREED ARTICLES AND ABSTRACTS PRESENTED IN CONFERENCES WITH NON-ARCHIVAL PROCEEDINGS

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22. Mutlu(*), E. and **Garibay, I.** (2020). Effects of assortativity on consensus formation with heterogeneous agents. In *International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS), Working paper proceedings*
 23. Bidoki(++), N. H., Schiappa(*), M., Sukthankar(**), G., and **Garibay(+), I.** (2019). Predicting social network evolution from community data partitions. In *International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS), Working paper proceedings*
 24. **Garibay(+), I.**, Schiappa(*), M., Anagnostopoulos(**), G., Berea(**), A., Bouwens(**), C., Fiore(**), S., Gunaratne(*), C., Mantzaris(**), A., Rand(**), W., Salter(**), A., Scheinert(**), S., Stanfill(**), M., Senevirathna(*), C., Jayalath(*), C., Baral(*), N., Murphy(**), J., Fair(++), G., Bidoki(++), N. H., Saadat(++), S., and Sukthankar(**), G. (2019). Deep agent: Computational social science centered simulation of online information environments. In *Proceedings of the International Conference on Computational Social Science (IC2S2-2019)*
 25. Gunaratne(*), C., Senevirathna(*), C., Jayalath(*), C., Baral(*), N., Rand(**), W., and **Garibay(+), I.** (2019). A multi-action cascade model of conversation. In *Proceedings of International Conference on Computational Social Science (IC2S2-2019)*, University of Amsterdam, The Netherlands
 26. Jayalath(*), C., Gunaratne(*), C., Senevirathna(*), C., and **Garibay, I.** (2019). A path dependent equivalence of the independent cascade model and the linear threshold model. In *Proceedings of International Conference on Computational Social Science (IC2S2-2019)*, University of Amsterdam, The Netherlands
 27. Senevirathna(*), C., Gunaratne(*), C., Jayalath(*), C., Baral(*), and **Garibay(+), I.** (2019a). Evidence of influence hierarchies in github's cryptocurrency community. In *Proceedings of International Conference on Computational Social Science (IC2S2-2019)*, University of Amsterdam, The Netherlands
 28. Senevirathna(*), C., Gunaratne(*), C., Jayalath(*), C., Baral(*), and **Garibay(+), I.** (2019b). Hidden patterns in influence hierarchies in github's cryptocurrency community. In *Conference of the Computational Social Science Society of the Americas (CSS-2019). Poster Session*, Santa Fe, NM
 29. Talebzadehhosseini(*), S., Gunaratne(*), C., Scheinert(**), S., and **Garibay(+), I.** (2019a). Countries diversification and transition to green economy. In *Proceedings of the Second Northeast Regional Conference on Complex Systems (NERCCS2019)*

30. Saeidi(*), M., Akula(*), R., Scheinert(**), S., Berea(**), A., and **Garibay(+), I.** (2019). The network of occupation space needs for economic improvement. In *Proceedings of the Second Northeast Regional Conference on Complex Systems (NERCCS2019)*
31. Talebzadehhosseini(*), S., Rajabi(*), A., and **Garibay, I.** (2019b). Country’s growth and the importance of city’s urban green development. In *The 1st International Conference on Smart Tourism, Smart Cities and Enabling Technologies (The Smart Conference)*, Orlando, FL
32. Belcher(*), B. and **Garibay(+), I.** (2019). Scalable user authentication via keystroke dynamics. In *The 1st International Conference on Smart Tourism, Smart Cities and Enabling Technologies (The Smart Conference)*, Orlando, FL
33. Basavaraj(*), P. and **Garibay, I.** (2018a). Increasing student success by balancing students’ academic load through personalized course recommendations. In *2018 Sunshine State Teaching and Learning Conference*
34. Talebzadehhosseini(*), S. and **Garibay(+), I.** (2018). A sustainable business model innovation for developing the nations green product space: Toward a better development of nations green economy. In *Doctoral Consortium on Computational Sustainability*, Ithaca, NY
35. **Garibay, I.**, Talebzadehhosseini(*), S., Astore(*), C., Borah(*), L., and Torres(*), K. (2017). An agent-based model to study the effects of epidemiological factors on three common influenza strain’s virulence. In *Proceedings of the Computational Social Sciences conference (CSS). Poster Session*, Santa Fe, NM
36. Gunaratne(*), C., **Garibay, I.**, Akbas(*), M. I., and Ozmen, O. (2016b). The need for product space complexity for agent-based computational economics. In *Duke Forest Conference 2016 Economics in the Era of Natural Computationalism and Big Data Celebrating the 50th anniversary of the “Theory of Self-Reproducing Automata” (by John von Neumann)*, Durham, North Carolina
37. Gunaratne(*), C., **Garibay, I.**, Akbas(*), M. I., , and Ozmen, O. (2016a). GIS derived spatial constraints for agent-based modeling of aedes aegypti population dynamics. In *SwarmFest Conference: Meeting on Agent-Based Modeling & Simulation*, University of Vermont, Burlington, Vermont

3.3.5 NON-REFEREED PUBLICATIONS AND E-PRINTS

1. Ibna Basher, M. J., Yalabadi, A. K., **Garibay, I.**, and Garibay, O. O. (2026). Con-
trobert: Ema stabilized dual encoders for template-based single-step retrosynthesis.
Submitted to NeurIPS 2026 Main Conference. <https://arxiv.org/abs/2605.12736>
2. Hossain, E., Roy Dipta, S., Neupane, S., Rana, R., Shwartz-Ziv, R., **Garibay, I.**,
and Yousefi(*), N. (2026c). Uat-lite: Inference-time uncertainty-aware attention for
pretrained transformers. <https://arxiv.org/abs/2602.02952>

3. Prottasha, N. J., Kowsher, M., Raman, H., Anny, I. J., Bhat, P., **Garibay, I.**, and Garibay, O. (2025). User profile with large language models: Construction, updating, and benchmarking. <https://arxiv.org/abs/2502.10660>
4. Oghaz(*), T. A. and **Garibay(+), I.** (2022). Dominant set-based active learning for text classification and its application to online social media. <https://arxiv.org/abs/2202.00540>
5. Jasser(*), J. and **Garibay(+), I.** (2021). Resilience from diversity: Population-based approach to harden models against adversarial attacks. <https://arxiv.org/abs/2111.10272>
6. Akula(*), R. and **Garibay(+), I.** (2021). Ethical ai for social good. <https://arxiv.org/abs/2107.14044>
7. Akula(*), R. and **Garibay(+), I.** (2021). Audit and assurance of ai algorithms: A framework to ensure ethical algorithmic practices in artificial intelligence. <https://arxiv.org/abs/2107.14044>
8. Mutlu(*), E. c., Rajabi(*), A., and **Garibay(+), I.** (2020c). Cd-seiz: Cognition-driven seiz compartmental model for the prediction of information cascades on twitter. <https://arxiv.org/abs/2008.12723>
9. Mutlu(*), E. c., Oghaz(*), T., Tütüncüler, E., Jasser(*), J., and **Garibay(+), I.** (2020b). Quantifying latent moral foundations in twitter narratives: The case of the syrian white helmets misinformation. <https://arxiv.org/abs/2004.13142>
10. Taylor(*), C. E., **Garibay(+), I.**, and Mantzaris(**), A. V. (2018b). How polarization can provide an increase in content dissemination amongst the highly ranked influencers. Presented at Conference on Complexity and Policy Studies 2018. <https://arxiv.org/abs/1805.10732>
11. Rajabi, A., Talebzadehhosseini, S., and Garibay, I. (2020). Resistance of communities against disinformation. arXiv e-print <https://arxiv.org/abs/2004.00379>
12. Garibay, I., Oghaz, T. A., Yousefi, N., Mutlu, E. C., Schiappa, M., Scheinert, S., Anagnostopoulos, G. C., Bouwens, C., Fiore, S. M., Mantzaris, A., Murphy, J. T., Rand, W., Salter, A., Stanfill, M., Sukthankar, G., Baral, N., Fair, G., Gunaratne, C., Hajiakhoond, N. B., Jasser, J., Jayalath, C., Newton, O., Saadat, S., Senevirathna, C., Winter, R., and Zhang, X. (2020). Deep agent: Studying the dynamics of information spread and evolution in social networks. arXiv e-print <https://arxiv.org/abs/2003.11611>
13. Alaghband, M., Yousefi, N., and Garibay, I. (2020). Feph: An annotated facial expression dataset for the rwth-phoenix-weather 2014 dataset. arXiv e-print <https://arxiv.org/abs/2003.08759>
14. Yousefi, N., Alaghband, M., and Garibay, I. (2019). A comprehensive survey on machine learning techniques and user authentication approaches for credit card fraud detection. arXiv e-print <https://arxiv.org/abs/1912.02629>
15. Gunaratne, C., Baral, N., Rand, W., Garibay, I., Jayalath, C., and Senevirathna, C. (2019). The effects of information overload on online conversation dynamics. arXiv e-print <https://arxiv.org/abs/1910.09686>

16. Akula, R., Nguyen, N., and Garibay, I. (2019). Supervised machine learning based ensemble model for accurate prediction of type 2 diabetes. arXiv e-print <https://arxiv.org/abs/1910.09356>
17. Akula, R., Yousefi, N., and Garibay, I. (2019). Deepfork: Supervised prediction of information diffusion in github. arXiv e-print <https://arxiv.org/abs/1910.07999>
18. Talebzadehhosseini, S., Scheinert, S. R., and Garibay, I. (2019). Growing green: the role of path dependency and structural jumps in the green economy expansion. arXiv e-print <https://arxiv.org/abs/1906.05269>
19. Bidoki, N. H., Sukthankar, G., Keathley, H., and Garibay, I. (2019). A cross-repository model for predicting popularity in github. arXiv e-print <https://arxiv.org/abs/1902.05216>
20. Gunaratne, C. and Garibay, I. (2018). Nl4py: Agent-based modeling in python with parallelizable netlogo workspaces. arXiv e-print <https://arxiv.org/abs/1808.03292>
21. Gunaratne, C., Garibay, I., and Dang, N. (2018). Evolutionary model discovery of causal factors behind the socio-agricultural behavior of the ancestral pueblo. arXiv e-print <https://arxiv.org/abs/1802.00435>
22. Gunaratne, C., Akbas, M. I., Garibay, I., and Ozmen, O. (2016). Evaluation of zika vector control strategies using agent-based modeling. arXiv e-print <https://arxiv.org/abs/1604.06121>
23. Soyler, E. and **Garibay(+), I** (2016). "UCF I-Corps: The Effects of Entrepreneurial Education on Entrepreneurial Intentions". Technical Report-02-16, Complex Adaptive System Laboratory, University of Central Florida.
24. **Garibay(+), I**, Ozmen, O., Koontz, A., Dunlop-Pyle, L., and Georgiopoulous, M. (2012). "SONET-MATH: Social Networks for Mathematics, Pilot Program Report". Technical Report 11-12, Complex Adaptive Systems Laboratory, University of Central Florida.
25. **Garibay(+), I**(Editor) (2012). Student Papers, Complex Adaptive Systems Class, Fall 2012. Technical Report Number CS-TR-12-05, Complex Adaptive System Laboratory, University of Central Florida.
26. **Garibay(+), I**(Editor) (2007). Student Papers, Evolutionary Computation Class, Spring 2007. Technical Report Number CS-TR-07-11, SEECs, University of Central Florida.
27. **Garibay(+), I** (2003). Advanced Life Support System Simulation. Technical Report CS-TR-03-05, University of Central Florida, School of Computer Science.
28. **Garibay(+), I** (2000). Generating Natural Language Documentation from Statecharts. Technical Report, University of Central Florida, School of Computer Science.

3.4 INVITED PRESENTATIONS AND PANELS

1. **Garibay I.(+)** (2026). Invited Speaker: Life is a Journey: AI is coming for our jobs edition. *Graduation Ceremony: Master of Science in Data Analytics, Class 2026*, Citrus Club, Orlando, FL, April 23, 2026.
2. **Garibay I.(+)** (2026). Invited Speaker: UCF Innovate! *NobleReach Foundation Meeting at UCF*, Partnership II Room 208, 3100 Technology Parkway, Orlando, FL 32826, April 21, 2026.
3. **Garibay I.(+)** (2025). Invited Speaker: Welcome Address, “research only changes the world when it’s understood by the world.” *Doctoral 3 Minute Thesis Competition, Fall Research Symposium*, Morgridge International Reading Center, UCF, Orlando, FL, November 12, 2025.
4. **Garibay I.(+)** (2025). **Keynote Speaker:** Agentic Artificial Intelligence (AI): the industrialization of AI and its impact on industry and innovation. *10th North American Conference on Industrial Engineering and Operations Management*, UCF FAIRWINDS Alumni Center, Orlando, Florida, USA, June 17-19, 2025.
5. **Garibay I.(+)** (2025). Invited Speaker: Agentic AI: the industrialization of AI and its impact on Airport Technology. *2025 AIRPORTECH Annual International Symposium*, Hyatt Regency Orlando Airport, Orlando, FL, February 4-7, 2025.
6. **Garibay I.(+)** (2025). Invited Speaker: Artificial Intelligence for Industrial Engineering. *Summit of the Siemens Energy Experts in the Americas.*, Double Tree Hotel, Orlando, FL, USA, November 19, 2024.
7. **Garibay I.(+)** (2024). Panelist. The opening panel on Transforming Healthcare through Intelligent Technologies. Discussed: Nexus for Pandemic Prediction, Prevention and Mitigation; and How AI is Speeding Up the Discovery of New Drugs. *2024 Florida Simulation Summit: Transforming Healthcare Through Intelligent Technologies*, DoubleTree by Hilton, Orlando, FL, Thursday, April 25, 2024.
8. **Garibay I.(+)** (2024). Invited Speaker: Life is a Journey: Data Science in the Age of Foundation Models. *Graduation Ceremony: Master of Science in Data Analytics, Class 2024*, Citrus Club, Orlando, FL, April 24, 2024.
9. **Garibay I.(+)** (2024). Invited Speaker: Innovate! *Talk delivered at the College of Engineering and Computer Science Dean’s Advisory Board*, Saturday, April 20, 2024, L3 Harris Engineering Center, UCF, Orlando USA
10. **Garibay I.(+)** (2024). Invited Speaker: UCF Innovate! *US Department of State: International Visitor Leadership Program*, March 14, 2024 UCF Business Incubation, Orlando, FL 32826, USA
11. **Garibay I.(+)** (2024). Invited Speaker: Innovate! *1st Annual UCF Innovate Symposium: Accelerating Research Translation*, March 11-12, 2024 Orlando, FL – UCF’s Center for Entrepreneurial Leadership

12. **Garibay I.(+)** (2023). Panel Moderator: Accelerating Research Translation in the US Southeast Region. Panelists include Keith McGregor, Georgia Teach, Venture Lab Director; Jim O’Connell, University of Florida, Assistant Vice President for Commercialization Svetlana Shtrom, UCF, Director, Office of Technology Transfer Jim Woodell, Venn Collaborative. *UCF Technology Ventures Symposium*, Orlando, Florida – October 16, 2023.
13. **Garibay I.(+)** (2023). Invited Speaker: Deep Agent Framework: The genesis of inverse generative social science as a method to leverage artificial intelligence to reformulate the modeling of social phenomena. *Summer Institute in Computational Social Science, Florida Atlantic University*, Jupiter, Florida, June 20th, 2023.
14. **Garibay I.(+)** (2023). **Keynote Speaker:** Artificial Intelligence and Complexity: A Guided Tour: On Information Warfare, Inverse Generative Social Science, Large Language Models, Deep Learning for Nanotech, Human-Centered Artificial Intelligence and other innovations at the Complex Adaptive Systems Laboratory. *4th South American Conference on Industrial Engineering and Operations Management*, JW Marriott Lima, Peru, May 9, 2023.
15. **Garibay I.(+)** (2023). Invited Speaker: Life is a Journey: Data Science in the Age of Chat-GPT3. *Graduation Ceremony: Master of Science in Data Analytics, Class 2023*, Citrus Club, Orlando, FL, April 4, 2023.
16. **Garibay I.(+)** (2022). Invited Talk: Welcome Speech to New MSDA Students. *MSDA Students Welcome Ceremony*, Orlando FL, August 19, 2022
17. **Garibay I.(+)** (2022). Invited Speaker: Life is a Journey: Challenges and Opportunities for New Data Scientists. *Graduation Ceremony: Master of Science in Data Analytics, Class 2021*, Citrus Club, Orlando, FL, April 22, 2021.
18. **Garibay I.(+)** (2021). Invited Talk: From Deep Agents to Deep Learning in Social Media Analysis and Modeling. *5th International Conference on Computational Intelligence, Cyber Security and Computational Models (ICC3 - 2021)*, PSG COLLEGE OF TECHNOLOGY - INDIA, December 17, 2021
19. **Garibay I.(+)** (2021). Invited Panel: Inverse Generative Social Science (iGSS): Challenges, Opportunities, and a First Approximation, *Computational Social Science Annual Conference*, Santa Fe, USA, November 5, 2021
20. **Garibay I.(+)** (2021). Invited Talk: El desafío de los sistemas dinámicos complejos en época de crisis, : *II Congreso Internacional del Pensamiento Complejo y Ciencias de la Complejidad: Megacrisis en un mundo en metamorfosis ¡Cambiamos de Vía! Homenaje al centenario de vida del Dr. Edgar Morin*, Lima PERU, October 30, 2021
21. **Garibay I.(+)** (2021). Invited Talk: Welcome Speech to New MSDA Students. *MSDA Students Welcome Ceremony*, Orlando FL, August 20, 2021

22. **Garibay I.(+)** (2021). Invited Talk: Inverse Generative Social Science (iGSS): Challenges, Opportunities and a First Approximation, *2nd Inverse Generative Social Science Workshop*, Virtual, USA, June 9, 2021, <https://www.igss-workshop.org>
23. **Garibay I.(+)** (2021). Invited Speaker: Life is a Journey: Challenges and Opportunities for New Data Scientists. *Graduation Ceremony via Teleconference: Master of Science in Data Analytics, Class 2021*, Orlando, FL, April 22, 2021.
24. **Garibay I.(+)** (2020). Invited Speaker: UCF Artificial Intelligence and Data Science Initiative. *UCF Technology Ventures Symposium "Find Your Hidden Gem in Central Florida: TRACK B Innovation in Focus: Data Analytics"*, Virtual – February 17th, 2021.
25. **Garibay I.(+)** (2020). Invited Speaker: Complex Social Systems Modeling and Artificial Social Intelligent Agents: Two Sides of the Same Coin. *UMd ARLIS UARC team*, Virtual – December 17th, 2020.
26. **Garibay I.(+)** (2020). **Keynote Speaker:** From Deep Agents to Inverse Generative Social Science: On ways to leverage artificial intelligence and vast computational power to reformulate modeling of social phenomena. *Data Science for Social Network Analysis, PSG-CARE (<https://www.psgcare.org>) - INDIA*, Virtual – November 28th, 2020.
27. **Garibay I.(+)** (2020). Invited Speaker: From Deep Agents to Inverse Generative Social Science: On Ways to Leverage Artificial Intelligence and Vast Computational Power to Reformulate Modeling of Social Phenomena. **Google Alphabet Talk Series**, Virtual – October 27th, 2020.
28. **Garibay I.(+)** (2020). Invited Speaker: From Deep Agents to Inverse Generative Social Science: On ways to leverage artificial intelligence and vast computational power to reformulate modeling of social phenomena. *Social Simulation Week 2020: Workshop on Model Discovery*, Milan, Italy – September 17th, 2020
29. **Garibay I.(+)** (2020). Invited Talk: Welcome Speech to New MSDA Students. *MSDA Students Welcome Ceremony*, Orlando FL, August 20, 2020
30. **Garibay I.(+)** (2020). Invited Talk: Agent-Based Models and Artificial Intelligence. *Inverse Generative Social Science Workshop*, PSG University Coimbatore - INDIA, August 20, 2020
31. **Garibay I.(+)** (2020). Invited Talk: From Deep Agents to Inverse Generative Social Sciences: On ways to leverage artificial intelligence and vast computational power to reformulate modeling of social phenomena. *Inverse Generative Social Science Workshop*, DC, USA, January 23-25, 2020, <https://www.igss-workshop.org>
32. **Garibay I.(+)** (2020). Invited Speaker: Data Science During a Pandemic: Challenges and Opportunities for New Data Scientists. *Graduation Ceremony via Teleconference: Master of Science in Data Analytics, Class 2020*, Orlando, FL, April 25, 2020.

33. **Garibay I.(+)** (2019). **Keynote:** Ciencias Sociales Computacionales: En la era de Inteligencia Artificial, Big Data e Innovación. *UCongreso internacional de Innovaciones Digitales Disruptivas - Ciudad Universitaria Universidad Nacional Mayor de San Marcos (UNMSM)*, Lima, Peru, October 28-30, 2019.
34. **Garibay I.(+)** (2019). Invited Talk: Computational Social Sciences Social Sciences in the Age of AI, Big Data and Computational Modeling. *UCF College of Business Interdisciplinary Speaker Series* Orlando, October 3rd, 2019.
35. **Garibay I.(+)** (2019). Invited Talk: Inteligencia Artificial, Datos Grandes e Innovación. *Universidad Externado de Colombia*, Bogota, Colombia, October 1st, 2019.
36. **Garibay I.(+)** (2019). Invited Talk: El investigador emprendedor: como iniciar, desarrollar y llevar al éxito un laboratorio de investigación en tecnología. *ISIT 2019 – International Symposium on Innovation and Technology (IIITEC)*, Cuzco, Peru, July 22-24, 2019.
37. **Garibay I.(+)** (2019). **Keynote:** Deep Agent: Combatiendo desinformación en redes sociales usando ciencias sociales computacionales. *ISIT 2019 – International Symposium on Innovation and Technology (IIITEC)*, Cuzco, Peru, July 22-24, 2019.
38. **Garibay I.(+)** (2019). Invited Speaker: The Future of Data Science: Being a Successful and Responsible Data Scientist. *Citrus Club Orlando: MSDA Graduation, Class 2019*, Orlando FL, May 2, 2019.
39. **Garibay I.(+)**, Fiore S., Cassani L. (2019). Invited Pitch for Funding: SIMS: Societal Influence Modeling & Simulation - TFA: Artificial Intelligence / Machine Learning for MISO. *SOFWEX*, Tampa FL, April 8, 2019.
40. **Garibay I.(+)** (2019). Invited Talk: Large Multidisciplinary Proposals. *UCF Researcher Experience Development initiative (REDi)*, Orlando FL, February 26, 2019.
41. **Garibay I.(+)** (2019). Invited Talk: Artificial Intelligence, Ethics, & Law: How AI is Disrupting the Legal Profession, Laws and Legal Technology. *Orange County Bar Association*, Orlando FL, February 21, 2019.
42. **Garibay I.(+)** (2019). Addressing the Department of Defense Science Board: Deep Agent: A Framework for Information Spread and Evolution in Social Networks. *IITSEC*, Orlando Convention Center, Orlando, FL, Nov. 27, 2018.
43. **Garibay I.(+)** (2019). Panel Moderator: Using Big Data Analytics to Create Better Guest Experiences *1st International Conference on Smart Tourism, Smart Cities, and Enabling Technologies (The Smart Conference)*, May 1-4, 2019, Rosen College of Hospitality Management, Orlando, Florida, USA.
44. **Garibay I.(+)** (2019). Fireside Chat Hosting Mr. Peter Torrellas, National Lead for Smart Cities and Communities at Siemens Smart Infrastructure. *1st International Conference on Smart Tourism, Smart Cities, and Enabling Technologies (The Smart Con-*

- ference), May 1-4, 2019, Rosen College of Hospitality Management, Orlando, Florida, USA.
45. **Garibay I.(+)** (2018). Invited Panelist: The post-truth society: misinformation, deepfakes, democracy and the role of scientists in an increasingly polarized world. *Conference of the Computational Social Science Society of the Americas*, Santa Fe, NM, 2018.
 46. **Garibay I.(+)** (2018). Invited Talk: Big Data & Innovation: How UCF is Helping Develop the Central Florida Big Data Innovation Ecosystem via Education, Research, and Innovation. *UCF Data Analytics Annual Symposium*, Orlando FL, March 22, 2018.
 47. **Garibay I.(+)** (2018). Invited Talk: Innovation in the era Artificial Intelligence: How Disney can leverage Deep Agent Modeling of Guest Experience and Life Long Learning Programs. *Disney Parks & Resorts Technology Innovation Open House Panel Discussion*. Walt Disney World, Orlando, FL, February 23, 2018.
 48. **Garibay I.(+)** (2017). **Congressional Testimony:** Responsible Innovation via Lifelong Learning: Artificial Intelligence Opportunities and Challenges. *Artificial Intelligence – Opportunities and Challenges Forum organized by The New Economy Task Force part of Jobs for America Task Forces - Invited by US Congressman Darren Soto*. The Capitol, Washington DC, November 15, 2017
 49. **Garibay I.(+)** (2017). Invited Talk: University of Central Florida and Walt Disney World: Common History and Perspectives for a Bright Future Together. *Disney's Engineering Excellence Town Hall*. Walt Disney World, Orlando, FL, April 6th, 2017.
 50. **Garibay I.(+)** (2016). Invited Talk: University of Central Florida's Master of Science in Data Analytics: Big Data Impact on Defense and How UCF is Preparing to Meet Future Workforce Demand from the Defense Sector. *Lockheed Martin's Data Analytics Town Hall*. Lockheed Martin Corporation, Orlando, FL, July 14th, 2016.
 51. **Garibay I.(+)** , Ford C., O'Neal T., Ozmen O. (2014). Invited Talk: Agent-based models of business incubation in the context of innovation ecosystems. Workshop on Innovative Methods for Testing Theory in the Practice of Organizational Sponsorship *Annual Meeting of the Academy of Management*. Philadelphia, USA, August 1-5, 2014.
 52. **Garibay I.(+)** (2014). Invited Talk: UCF I-Corps Site: NSF-funded program that makes UCF a member of the National Innovation Network and will support 96 startup teams over 3 years (2014-2017). *Central Florida Entrepreneurship Network Group* . Orlando, USA, May 28th, 2014
 53. **Garibay I.(+)** (2013). Invited Talk: Construyendo Ecosistemas de Innovación: Incubando Empresas en la Florida y en Silicio. *3rd International Symposium on Innovation and Technology*. Cusco, Peru, November 26-28, 2013.

54. **Garibay I.(+)** (2013). Invited Talk: Possibilities for data collection, analysis, and modeling using machine learning and complexity sciences techniques. *Workshop on Data Collection, Analysis and Modeling of Nanoparticle/Cell Interactions for Cancer Research*. Orlando, FL, October 11, 2013.
55. **Garibay I.(+)** (2013). Invited Talk: Innovation Ecosystems: Agent-Based Generative Modeling of Regional Economic Growth. *DARPA/Bank of America Economic Modeling Workshop at University of North Carolina's Complex Systems Institute*. Charlotte, NC, March 21, 2013.
56. **Garibay(+), I** (2011). Invited Talk: Agent-Based Modeling of Social and Economical System. *2nd International Symposium on Innovation and Technology*. Lima, Peru, November 28-30, 2011.
57. **Garibay(+), I**(2006). Dagstuhl Seminar 06061: Theory of Evolutionary Algorithms (participation by invitation only, financed by the German federal government). The International Conference and Research Center for Computer Science, Wadern, Germany, February 5-10, 2006. (Internationales Begegnungs- und Forschungszentrum für Informatik (IBFI) Schloss Dagstuhl gGmbH)
58. **Garibay(+), I** (2006). Invited Talk: Proteomics approach to Evolutionary Computation. Seminar at the Electrical Engineering and Computer Science Department, Universidad Ricardo Palma, Lima, Peru, January 4, 2006. Delivered also at a Seminar at the Research Institute of the Systems Engineering and Informatics Department, Universidad Nacional Mayor de San Marcos, Lima, Peru, January 5, 2006.
59. **Garibay(+), I**, Miller J., Kumar S., Hornby G., Ozmen O., and Oner K. (2006), Opening Talk: Workshop on Complexity through Development and Self-Organizing Representations: Building Complexity from Simplicity, In *Workshop Proceedings of Genetic and Evolutionary Computation Conference - GECCO 2006*, Seattle, USA, July 8-12, 2006.
60. **Garibay I.(+)**, and Wu A.S. (2004). Opening Talk: Workshop on Self-Organization in Representations for Evolutionary Algorithms: Building complexity from simplicity. In the *Proceedings of the GECCO 2004 Workshop on Self-organization in Representations for Evolutionary Algorithms*, Seattle, USA, June 26-30, 2004.
61. Ozmen O., **Garibay I.(+)**, and Wu A.S. (2004). Invited to submit: No Free Lunch for Module Encapsulation. In the *Proceedings of the GECCO 2004 Workshop on Modularity, Regularity and Hierarchy in Open-ended Evolutionary Computation*, Seattle, USA, Jun 26-30, 2004.

3.5 RESEARCH TRANSLATION

3.5.1 Startups

- **DeepBio Scientific, Inc.**, Co-founder and CEO. Founded February 17, 2026. A biotechnology startup that specializes in providing generative artificial intelligence ser-

vices to the biotechnology community, including AI co-scientists and biomolecular foundation models.

3.5.2 Patents

- System of and method for automatically detecting sarcasm of a batch of text, Inventor Ramya Akula and Ivan Garibay, patent US12210833B2 United States, granted January 28, 2025
- INTERPRETABLE MULTI-HEAD SELF-ATTENTION ARCHITECTURE FOR SARCASM DETECTION, for which an application for U.S. Letters Patent was filed on August 20, 2021, as Serial No. 63/260,477.
- Protein Translation Equivariant Encoding for mRNA Language Models (inventors Mehdi Yazdani-Jahromi, Ozlem Ozmen Garibay, Ali Khodabandeh Yalabadi, and Ivan Garibay), for which a non-provisional application for U.S. Letters Patent was filed on July 1, 2026, as Serial No. 19/727,645 (originally filed as U.S. Provisional Application Serial No. 63/260,477 on July 1, 2025).

3.5.3 Copyrights

- Florida Angel Nexus: Angel Investor Network Management System ©2012 UCF
- APAS: Institutional Animal Care and Use Committee Management System ©2012 UCF
- Institutional Review Board and Regulations Compliance Management System ©2005 UCF
- A University Resources On-Line Reporting Application: AURORA ©2004 UCF
- Intellectual Property Management System: Intel-Pro ©2003 UCF
- Personal Access to the Office of Research Information Systems: PARIS ©2003 UCF
- Digital Documents Storage and Retrieval System: TeraServer ©2002 UCF

3.6 GRANTS AND CONTRACTS

3.6.1 FEDERAL FUNDING

Title:	Center: National Commercialization and Translation Institute (NCTI) Pilot Program
Program:	Directorate for Technology, Innovation and Partnerships (TIP)
Agency:	National Science Foundation (NSF)
Award:	Cooperative Agreement, FAIN 2631575
Role:	PI
Period:	8/15/2026 – 7/31/2028
Amount:	\$20,000,000.00

Investigators: Ivan Garibay (PI); Michael Georgiopoulos (Co-PI); Thomas O’Neal (Co-PI); Ronald F. Piccolo (Co-PI, ICAMR, Inc.)

Description: A persistent gap exists between federally funded deep-technology R&D and commercial success: such projects are often left without support at the late stages of R&D, precisely when a company should transition to an intensive focus on commercialization. NCTI undertakes evaluative research, via a pilot of a proposed National Commercialization and Translation Institute, to determine whether the route from deep-technology R&D to commercialization can be better understood and whether mechanisms can be developed to more reliably ensure commercial success as an outcome of publicly funded deep-technology R&D. Through a competitively scored national open competition, the project selects six to eight NSF SBIR/STTR Phase II or Phase IIB companies and funds them, against verified milestones, through the program’s five stages — SUPPORT, EDUCATE, ORIENT, CONNECT, and MODEL — each designed to extract insights (positive signals and failure modes) regarding commercialization potential. An external evaluator assesses the effectiveness of the research methodology and the impact of the outcomes. Of the \$20M total, \$16M is dedicated participant support for the selected companies. Co-PIs: Michael Georgiopoulos (Dean, College of Engineering and Computer Science), Thomas O’Neal, and Ronald Piccolo. NSF Directorate for Technology, Innovation and Partnerships (TIP).

Title: **ART Supplement: Accelerating Research Translation in the Space Coast: Building a Resilient Planet via Geospace and Coastal Sciences Translation**

Program: Accelerating Research Translation (ART)

Agency: National Science Foundation (NSF)

Role: PI

Amount: **\$270,000.00**

Investigators: Ivan Garibay (PI); Thomas O’Neal (Co-PI); Scott Branting (Co-PI); Adrienne Dove (Co-PI); Ozlem Garibay (Co-PI)

Description: The University of Central Florida (UCF) currently has 22 active NSF-funded projects from the Geosciences (GEO) directorate that focus on two broad areas of research: (A) solar-terrestrial and aeronomy studies, supported by the Atmospheric and Geospace Science (AGS) division; and (B) coastal resilience in the face of global change and sea level rise, supported by Earth Sciences (EAR) and Ocean Sciences (OCE) divisions. This focus is unsurprising, given that two major strategic research areas at UCF are space sciences and coastal resilience. UCF is also known as Space-U because it was created in 1963 to support the Kennedy Space Center's mission to put a man on the moon. UCF is now the number 1 talent provider nationally in the aerospace industry, and researchers have worked on more than 674 NASA projects. Coastal sciences are of paramount importance in Florida due to the rise of sea levels and the erosion of coastal areas that it produces. As a result, UCF has a robust ecosystem of industry, research centers, and venture capital that specializes in these two GEO-relevant research areas. However, these areas are currently underrepresented in our technology transfer efforts compared to engineering, computer science, and life sciences.

Title: **ART: From Research to Impact, Building the Translational Capacity of the UCF's Innovation Ecosystem**

Program: Accelerating Research Translation (ART)

Agency: National Science Foundation (NSF)

Role PI

Amount: **\$6,000,000.00** (IG 40%: \$2,400,000.00)

Investigators: Ivan Garibay (PI); Winston Schoenfeld (Co-PI); Carolina Cruz-Neira (Co-PI); Svetlana Shtrom (Co-PI); Cameron Ford (Co-PI)

Description: The University of Central Florida (UCF), a Hispanic Serving Institution (HSI), in alliance with the Georgia Institute of Technology (Georgia Tech), a high-research translational institution in UCF's proximity, will utilize the 2023 NSF ART funding award to launch "ART: From Research to Impact, Building the Translational Capacity of UCF's Innovation Ecosystem." UCF's ART goal is to enhance UCF's research translation capacity by building missing components of the innovation ecosystem and by expanding existing infrastructure with Georgia Tech's assistance (IHE mentor). UCF's ART has five objectives: (1) enhance research translation capacity by (a) creating a Venture Lab modeled after Georgia Tech's Venture Lab to directly support translation and by (b) reorganizing our entire entrepreneurial support infrastructure into a more coordinated and synergistic innovation ecosystem; (2) enhance the educational and training opportunities to graduate students and postdocs by expanding the outreach of existing entrepreneurial courses to these students; (3) support 6 STRPs throughout the grant period and monitor their progress to assure that the translational ecosystem functions well; (4) create, expand and sustain a network of ART Ambassadors that will support the translational infrastructure enhancement, training and education, and the STRPs (a strong start with 20+ ART Ambassadors and 10+ partnerships assures that their active involvement with UCF's ART will further expand this network); and (5) ensure all UCF's ART efforts support diversity, equity, inclusion and accessibility (e.g., diversity of participants). UCF's ART efforts will be evaluated by an external firm and pivot, as necessary, to achieve the project's goal.

Three of the pivotal elements of UCF's ART are: (a) the new Venture Lab, (b) expanded education and training of graduate students and postdocs, and (c) the extensive ART Ambassadors network. The broader impacts of (a) are (1) promising research results, including the selected STRPs, will be translated more effectively to market, resulting in societal benefit, (2) university entrepreneurs and STRP leaders will come from UCF, an HSI, and (3) spinoff companies from the university will result in higher local, regional, and national employment. The broader impacts of (b) are (1) hundreds of graduate students and postdocs from an HSI will receive entrepreneurial training and (2) these trained graduate students and postdocs will be better prepared for careers in industry, government, or as leaders of startup companies. The broader impacts of (c) are (1) ART Ambassadors will help carry out, enhance, and sustain all UCF's ART activities (education, mentoring, STRPs, other) and (2) ART Ambassadors will help change the culture (strong appreciation of the value of translational research) of the institution.

Title: **Influence Cascades Ecosystem (ICE): Entropy-based Characterization and Modeling of Influence Patterns and Pathways across Traditional and Social Media**

- Agency: Defense Advance Research Projects Agency (DARPA), US Army Contracting Command,
- Program: Artificial Intelligence Explorations (AIE): Modeling Influence Pathways (MIPs), PM: Dr. Brian Kettler
- Award: AWD00005083
- Role: Co-PI
- Period: 8/1/2022 1/31/2024
- Amount: **\$1,000,000** (IG 25%: \$250,000)
- Investigators: Ivan Garibay (Co-PI); Alexander Manzaris (Co-PI); Ozlem Garibay (PI)
- Description: As a consequence of evident information manipulation in the conflict between Russia and Ukraine, information warfare has increased urgency and importance. Information warfare, defined for this proposal as the range of military and government operations to protect and exploit the information environment, depends on understanding, accurate characterization, and reliable forecasting of the information environment dynamics. Yet, despite much research into social media, including analysis of individual influence campaigns, messages, and platforms, we lack the tools, techniques, and fundamental research to effectively understand the information flows and their effects on the entire information ecosystem. For example, how is information amplified or dampened as it moves from one online community to another? How is information modified or framed into narratives that favor or malign viewpoints organically or by foreign actors? How does disinformation flow from fringe to mainstream communities? We posit that the information ecosystem is an attention economy with influence—the ability to gather attention towards a particular message or messages—being its currency. Under this view, we see the information ecosystem as a complex network of influence flowing between communities. We envision technology, in real-time, to extract the influence networks for the ever-evolving information ecosystem and be able to pinpoint emerging threats and provide options to counter them.
- Title: **Artificial Social Intelligence to support Macrocognition in Teams (ASIMT)**
- Agency: Defense Advance Research Projects Agency (DARPA), US Army Contracting Command, Co-PI
- Program: Artificial Social Intelligence for Successful Teams (ASIST), PM: Dr. Joshua Elliott
- Award: W911NF2010008
- Role: Co-PI
- Period: December 2019—December 2023
- Amount: **\$1,494,689** (IG 22.5%: \$336,305)
- Investigators: Ivan Garibay (Co-PI); Gita Reese Sukthankar (Co-PI); Florian Jentsch (Co-PI); Stephen M Fiore (Co)

Description: The concept of the networked battlefield has been at the forefront of military thinking for over two decades now. First, it came as a futuristic concept, with thinkers imagining the power of the internet leveraged to enhance command decision-making. Then, it evolved to encompass wireless technology and how that could directly connect the warfighter to augment real-time situation awareness. Now we are at the place where semi-autonomous and, soon, autonomous, systems are commonplace on the battlefield. When envisioning future teaming, we must look further than the internet. What is required is a scientific research program that does more than ‘connect’ human and technological capabilities. In the coming decades, the warfighter of the 21st century will be more akin to a cybernetic super-organism where technology is not merely a tool of the team, but is, inherently, a member of the team. This is our vision for our TA2 proposal. The goal of such a vision is both a symbiotic and a synergistic relationship between human and machine. We envision a relationship between warfighter and technology that is symbiotic because they will learn from each other. With present day human-human teams, member collaboration over repeated interaction episodes, informs knowledge of their task, their situation, and teammates. The most promising vision for future hybrid human-machine teams is to design them such that they learn from each other to develop and evolve over time to achieve team expertise.

Title: **Deep Agent: A Framework for Information Spread and Evolution in Social Networks**

Agency: Defense Advance Research Projects Agency (DARPA), US Air Force Research Laboratory (AFRL), PI

Program: Computational Simulation of Online Social Behavior (SocialSim), PM: Dr. Brian Kettler

Award: FA865018C7823

Role: PI

Period: October 2017—December 2021

Amount: **\$6,200,000** (IG 43%: \$2,666,000)

Investigators: Ivan Garibay (PI); Gita Reese Sukthankar (Co-PI); Alexander Mantzaris (Co-PI); Stephen M Fiore (Co-PI)

Description: For this project, we will build a comprehensive, realistic, and at-scale computational simulation of information spread and evolution in online social networks using a novel computational modeling paradigm: Deep Agent Framework (DAF). The Deep Agent Framework unleashes the power of combining massively parallel computing, data analytics of large datasets and machine learning into assisting model designers to mix and match sub models in a semi-automated way, exploring, testing and validating not one but tens of thousands of models against not a single real world phenomenon but a large set of target behaviors. This process will aid model designers to continuously improve the best-so-far model as the problem challenges become more difficult. In fact, this process would also serve to automatically recombine and introduce variants to all the models produced by different TA1 performers in order to obtain the overall best model. This framework will enable the creation of an accurate and at-scale simulation of information spread and evolution that can run on a typical off-the-shelf commercial computer or small cluster.

Title: **Disrupting LegalTech: I-Corps: Using Artificial Social Intelligence for Legal Team Assistants.**

Agency: National Science Foundation (NSF), PI, NSF

Program: Innovation Corps, Industrial Innovation and Partnerships, Engineering Grants, PM: Dr. Steven Konsek

Award: IIP-1933260

Role: PI

Period: July 2019—December 2019

Amount: **\$50,000** (IG 100%: \$50,000)

Investigators: Ivan Garibay (PI);

Description: Our research helps practitioners who want to perform qualitative data analysis on unstructured data. Unlike existing tools that only manage data, our tool also performs smart AI automation by leveraging machine learning based predictive analytics. The target customers are practitioners at law firms, corporations, government agencies, and academic researchers and who want to perform qualitative data analysis on large volumes of unstructured data. Our technology aids the case discovery process in the legal field, which often involves loads of electronically stored information. Document review-based case discovery that involve litigations is a \$100 billion industry. In intellectual property cases alone, discovery of prior art literature is a \$40 billion industry by itself.

Title: **EAGER: Defining, Measuring and Advancing University Economic Engagement: A Research Initiative for moving forward Science and Innovation Policy**

Agency: National Science Foundation (NSF), PI, NSF

Program: NSF: Social, Behavioral, and Economic Sciences, PM: Dr. Maryann Feldman

Award: SMA-1738956

Role: PI

Period: May 2017—Dec 2018
 Amount: **\$50,000** (IG 95%: \$47,500)
 Investigators: Ivan Garibay (PI); Ozlem Garibay (Co-PI)
 Description: How can universities better engage with their communities in order to produce technologies and innovations that most productively contribute towards creating high-paying jobs in their regions? How can universities be most effectively engaged to teach the skills that are in high-demand in the labor market? This research provides initial answers to these and other questions by studying "university engagement". A better understanding of how universities engage with their communities will provide a foundation for gaining insight into the economic impact of university research and teaching. Defining, measuring and advancing university economic engagement is a potentially transformative research initiative for moving forward science and innovation policy that will result in a wide-range of regional and national societal benefits. Research universities are vital components of innovation ecosystems at the local, regional and the national levels. Innovation ecosystems are widely-acknowledged engines of innovation-driven economic growth that result in high-paying high-technology jobs, vibrant communities, fertile environments for technology startups, societal wellbeing in terms of economic prosperity and quality of life, and the economic and national security of the United States.

Title: **Expanding the Pipeline: Vertical Research at Scale**
 Agency: Department of Homeland Security (DHS) – Sub for University of Nebraska, Co-PI
 Program: DHS S&T Terrorism Prevention and Counterterrorism Research (TPCR) Center of Excellence (COE) – Partner
 Award: SMA-173895644-0108-1001-402
 Role: Co-PI
 Period: July 2020—June 2022
 Amount: **\$403,184.00** (IG 10%: \$40,318)
 Investigators: Vela, Adan (PI); Ivan Garibay (Co-PI)
 Description: Guided-inquiry learning and research-based projects help undergraduate and graduate students translate classroom knowledge into real-world problem-solving while teaching them to ask the right questions. Unfortunately, such project-based opportunities are often limited to select students at resource-constrained universities. To expand learning opportunities to broader sets of students this workforce development program seeks to develop and implement a big-data course based on guided-inquiry research projects. At the core of the course will be vertical integration of undergraduates, masters, and PhD students, as well as faculty. The long-term goal of the proposed program is to translate the course into a fully online option, allowing for the adoption of the course at other universities, while also making it available to those working in homeland security.

- Title: **Type II: UCF I-Corps Site - enhancing technology commercialization to develop a world-class innovation ecosystem**
 Agency: National Science Foundation (NSF), Co-PI, NSF
 Program: Innovation Corps - National Innovation Networks Sites Program (I-Corps Sites), Industrial Innovation and Partnerships, PM: Dr. Anita J. LaSalle
 Award: IIP-1735841
 Role: Co-PI
 Period: August 2017—July 2020
 Amount: **\$300,000** (IG 33%: \$99,000)
 Investigators: Thomas P O'Neal (PI); Ivan I Garibay (Co-PI); David S Metcalf (Co-PI)
 Description: University of Central Florida (UCF), the nation's second largest university, is a leader in research, commercialization, and entrepreneurship. UCF is the innovation engine for Central Florida's well-established high-tech cluster in modeling, simulation and training (MS&T), which directly employs more than 30,000 and represents more than \$6 billion to the regional economy. UCF is the anchor for the Optics and Photonics cluster, the emerging medical cluster, and the new smart sensor advanced manufacturing cluster in the region. Over the past two decades, UCF has developed a robust innovation ecosystem consisting of direct programs and a breadth of relationships with organizations in the community, working collaboratively to translate innovations into regional economic growth. With the NSF I-Corps Site, UCF successfully achieved its established goals to enhance the transition of UCF research into the marketplace; expanding the integration of the LLP Methodology throughout the university to increase the number of I-Corps teams and new ventures; and to contribute meaningfully to the unique mission and brand of the National Innovation Network (NIN). The goal of the UCF I-Corps Site renewal grant is to critically assess, refine, and improve on all aspects of the existing program, and to continue our focus on enhancing technology commercialization to develop a world-class innovation ecosystem that commercializes innovative research for real-world applications. The UCF I-Corps Sites renewal will provide a curriculum delivered by nationally certified LLP instructors and a robust and diverse pool of experienced mentors.
- Title: **University of Central Florida I-Corps Sites Program: Enhancing technology commercialization at a world-class innovation ecosystem**
 Agency: National Science Foundation (NSF), Co-PI, NSF CNS: 1347356
 Program: Innovation Corps - National Innovation Networks Sites Program (I-Corps Sites), Industrial Innovation and Partnerships, PM: Dr. Anita J. LaSalle
 Award: CNS-1347356
 Role: Co-PI
 Period: May 2014—May 2018
 Amount: **\$360,000** (IG 20%: \$72,000)
 Investigators: Thomas P O'Neal (PI); Ivan I Garibay (Co-PI); Cameron M Ford (Co-PI); Michael Jay ODonnell (Co-PI); Timothy G Kotnour (Co-PI)

Description: The “University of Central Florida I-Corps Sites Program: Enhancing technology commercialization at a world-class innovation ecosystem” effort is a partnership between the Office of the Vice President for Research, Center for Entrepreneurial Leadership at the College of Business Administration, and the College of Engineering and Computer Sciences. The goal of this effort is to increase the UCF translation of technologies into the marketplace by recruiting, evaluating and providing entrepreneurial support funded jointly by NSF and UCF to thirty entrepreneurial teams per year, each team consisting of an Academic Lead, an Entrepreneurial Lead and Mentor. This effort leverages the existing and extensive programs that currently promote entrepreneurship and innovation including: UCF Venture Lab, UCF Business Incubation Program, Office of Technology Transfer, UCF Research Park, Center for Entrepreneurship Leadership, Blackstone LaunchPad, Florida Angel Nexus, among many others.

3.6.2 INDUSTRY FUNDING

Title: **Disney-UCF Lifelong Learning Program: A New Paradigm in STEM and Business Workforce Development - PHASE II**

Agency: Walt Disney Attractions, Inc. (Disney), PI

Role: PI

Period 1: January 2019—March 2020

Period 2: January 2018—December 2018

Amount 1: **\$397,479** (IG 60%: \$238,487)

Amount 2: **\$398,000** (IG 60%: \$239,000)

Investigators: Ivan I Garibay (PI); Charles E Hughes (Co-PI)

Description: Lifelong learning is a novel educational paradigm that keeps Disney’s workforce competitive in the latest technologies, for this pilot: deep learning technology. This innovative model effectively results in a replicable and structured method to inject tangible innovation into an organization by bringing external experts to train teams of talented local engineers, technologist and managers. These teams are mentored in the process to creating novel ideas for technology startups, but in this case the startups are internal to the organization. The teams ideate, develop, and transition, innovative projects. About 65% of these projects have been adopted as innovations across the entire Disney World Global operations. Walt Disney World is an industry titan that is located in Orlando. This is one of only few cases on which University of Central Florida received meaningful funds from Disney.

Title: **Social/Cognitive Cybersecurity for our Online Social Networks**

Program: Microsoft Azure Credit-NSF BDHub network

Agency: Microsoft Corporation, PI

Role: PI

- Period: January 2019—January 2020
 Amount: **\$60,000** (IG 100%: \$60,000)
 Investigators: Ivan I Garibay (PI)
 Description: For this project, we will build and test in Azure the “Cloud-based high-performance computing Evolutionary Model Discovery (EMD)” component of a comprehensive, realistic, and at-scale computational simulation of information spread and evolution in online social networks using a novel computational modeling paradigm: Deep Agent Framework (DAF). This is important because online social networks have become ubiquitous in today’s society yet users are often faced with problems like bots, abuse, security and privacy problems such as identity theft, and other similar cyber threats. Evolutionary model discovery can inform this research by creating better predictions and offering more control for unusual outcomes as researchers map the network for anomalies.
- Title: **Deep Cyber: Using Big Data Distributed Machine Learning for Fraud Detection and Risk Assessment in Large Financial Institutions**
- Agency: Royal Bank of Canada, PI
 Role: PI
 Period: January 2018—December 2018
 Amount: **\$102,890.00** (IG 100%: \$102,890.00)
 Investigators: Ivan I Garibay (PI)
 Description: Over the past decade, rapid developments in ML, DS and software/hardware technology have unlocked a considerable potential in satisfactorily addressing computational and “intelligent” tasks to a level that was previously thought to be unattainable. Such capabilities have benefited, sometimes greatly, a variety of application domains with image recognition/annotation via deep learning being, perhaps, an egregious example. This research includes: (i) classification tasks: categorizing an activity/customer into one of several given classes (e.g. deciding whether to grant credit to an applicant based on their credit history after weighing associated risks), (ii) “classic” detection tasks: in essence, binary classification tasks, where one of the classes has a more significant meaning over the other (e.g. fraudulent over legitimate activity) and (iii) anomaly detection tasks: colloquially referred to as one-class classification, which attempts to describe data normalcy (e.g. one learns what constitutes normal activity, in order to flag unusual activity, such as fraud, for further inspection) and (iv) clustering tasks: discovering naturally-occurring group structure in available data (e.g. segmenting customers into groups based on their credit history, which may naturally give rise to “high”, “medium” and “low” risk customer blocks; the obtained result may be useful in the context of exploratory customer data analysis).
- Title: **Large-scale modeling and simulation of complex socio-economic systems**
- Program: AWS Cloud Credits for Research Program

- Agency: Amazon.com, PI
 Role: PI
 Period: March 2017—March 2018
 Amount: **\$20,000** (IG 100%: \$20,000)
 Investigators: Ivan I Garibay (PI)
 Description: Complex adaptive systems study populations of decentralized interacting entities that are reactive to their environment. The micro-level rules of these entities, together with the state of the environment that contains them, define the behavior of the system and result in the emergence of macro phenomena. Unlike equation-based methods that attempt to directly describe macro behavior, computational agent-based modeling captures the essence of this emergence by modeling from the "bottom-up". In other words, agent behaviors are described, and macro behaviors emerge as a result of the interaction among the computational agents.
- Title: **Computational modeling of the Zika virus spread: A GIS driven complex adaptive systems approach to modeling the population dynamics of Aedes aegypti**
- Program: Microsoft Azure Research Award
 Agency: Microsoft Corporation, PI
 Role: PI
 Period: January 2017—January 2018
 Amount: **\$5,000** (IG 100%: \$5,000)
 Investigators: Ivan I Garibay (PI)
 Description: Aedes aegypti is responsible for transmitting several arboviral diseases, including Dengue, Yellow Fever, Chikungunya, and Zika. Understanding the population dynamics of the Aedes aegypti mosquito is, therefore, crucial for effectively deploying vector control strategies. Computational modeling has proved to be a success story in the modeling of mosquito populations in urbanized environments (Focks et al., 1993), where differential equation methods have faltered at capturing the high dimensionality of this problem. Agent-based modeling, in particular, is highly relatable to modeling mosquito population dynamics (de Almeida et al., 2010; Arifin et al., 2015). Computational decision trees, depicting a mosquito's daily circadian rhythm and life stages, can be embedded within individual agents. Interactions between the simulated agents will then determine the size and distribution of the simulated mosquito population.

3.6.3 STATE FUNDING

- Title: **Deep Cyber: Using Big Data Distributed Machine Learning for Fraud Detection and Risk Assessment in Large Financial Institutions**
- Agency: Florida High Tech Corridor Council (FHTCC), PI

Role: PI
Period: January 2018—December 2018
Amount: **\$33,361.00** (IG 100%: \$33,361.00)
Investigators: Ivan I Garibay (PI)
Description: Matching grant to the Royal Bank of Canada project.

3.7 PENDING FUNDING

Title: **Center: PIPP Phase II: Theme 2: Pandemic Prediction, Prevention, and Mitigation (P3M): Integrating Nanotechnology, AI, Cognitive Epidemiology, Tourism, Modeling, and Simulation**
Program: Predictive Intelligence for Pandemic Prevention Phase II (PIPP Phase II Centers Program)
Agency: National Science Foundation (NSF)
Role: PI
Amount: **\$18,000,000.00** (IG 20%: \$3,600,000.00)
Investigators: Ivan Garibay (PI); Sudipta Seal (Co-PI); Ozlem O. Garibay (Co-PI); Griffith Parks (Co-PI); Robertico Croes (Co-PI)

Description: As of October 2023, the COVID-19 pandemic has killed over 6.97 million people globally, including 1.14 million in the US. The damage to the US economy is estimated at \$16 trillion, and it is considered one of the most damaging disruptions in the history of American education. The University of Central Florida (UCF), a Hispanic Serving Institution (HSI), in alliance with the New York University (NYU) and the North Carolina State University (NCSU), will utilize the 2023 NSF PIPP II call to launch the "Center for Pandemic Prediction, Prevention, and Mitigation (P3M)". P3M's grand challenge is to transform society's ability to respond early and effectively to mitigate the spread of new infectious disease outbreaks with pandemic potential. Given the emergence of a new pathogen, pharmacological interventions like vaccines take months to develop and test for safety. Non-pharmacological interventions that limit human mobility, like travel bans, self-isolation, and school closures, can be effective for early mitigation but come with devastatingly high societal and economic costs. Furthermore, limiting mobility is not an option for the healthcare, defense, and national security sectors. The best intervention currently available for early mitigation is the use of personal protective equipment (PPE), but it suffers from shortcomings in effectiveness and adoption. P3M's goal is to advance foundational science and produce transformative technological innovations for the early mitigation of potential pandemics, focusing on science supporting the development of next-generation PPE and maximizing uptake. P3M has four objectives: (I) Conduct collaborative, interdisciplinary, fundamental research on early mitigation and prevention of pandemics with a focus on next-generation PPE and maximizing PPE uptake; (II) offer education and workforce development opportunities to train undergraduate, graduate, and post-docs to become pandemic scientists or to pursue pandemic-related careers; (III) demonstrate the principles of diversity, equity, and inclusion to broaden participation in pandemic-related sciences; and (IV) become a national nexus for collaborative research efforts on improving PPE with nanomaterials and human-behavior epidemiology for PPE uptake towards early mitigation and the prevention of future pandemics.

We conduct foundational research in two interrelated interdisciplinary research thrusts with a high potential to advance knowledge and integrate across disciplines. Thrust A will conduct research at the intersection of virology, nanotechnology, and artificial intelligence to advance a fundamental understanding of pathogen interactions with nanoparticles, computational modeling, and machine learning to aid in nanoparticle design. Thrust A is use-inspired by the need for the next generation of more effective PPE technologies. Thrust B will research at the intersection of epidemiology modeling, human behavior, information sciences, and artificial intelligence to advance understanding of the cognitive mechanisms driving human behavior during epidemics, then use this understanding to design messaging strategies to maximize PPE uptake. Both Thrusts propose creative and potentially transformative concepts with a high probability for success due to promising preliminary work, team experience, and resources. For example, our preliminary data on developing metal-modified catalytic oxide nanomaterials to produce SARS-CoV-2-eliminating coatings and additives for PPE is encouraging.

The primary societal impact stems from P3M's expected scientific and technological contributions toward the early mitigation of a new emergent pathogen. P3M will provide the required scientific advances in bionanotechnology needed to create a radically innovative PPE and scientific advances in human-behavior epidemiology to improve education, communication, simulation, and training towards near universal uptake in an emergent pandemic. P3M will provide extensive educational opportunities to 1,000+ students (including minorities) at UCF, NYU, and NCSU, with an expected high impact on broadening participation in STEM and other sciences related to pandemic preparedness. P3M funds will support several pandemic intelligence and preparedness educational offerings, including high-school summer camps and teacher training, undergraduate research experiences, undergraduate general education course development, and graduate certificates in synergy with the two research Thrusts. P3M will serve as a national nexus, leveraging deep institutional relationships with tourism, healthcare, defense industries, government, and academic partners. Our partners are committed to providing data, expertise, testbed development, co-design, and co-development of P3M's innovations for accelerated research translation.

Title:	A Neuro-physiological AI-Supported System for Assuring Intrinsic Cognitive Security in Mixed Reality Environments.
Program:	Intrinsic Cognitive Security (ICS)
Agency:	Defense Advanced Research Projects Agency (DARPA)
Role	Co-PI
Amount:	\$8,524,208.00 (IG 15%: \$1,278,631.00)

Investigators: Garibay Ivan (Co-PI); Waldemar Karwowski (PI); Cruz-Neira Carolina (Co-PI); Garibay Ozlem (Co-PI); Laviola II Joseph (Co-PI); Reiners Dirk (Co-PI); Sawyer Ben D. (Co-PI)

Description: Developing guarantees against cognitive attacks on operators using mixed reality (MR) systems is necessary, as these systems are being widely deployed in military systems. Our team will collect neural and performance data in long-duration, high-fidelity missions to create strong formal models and effective guarantees that support mission success. Our interdisciplinary team comprises experts comfortable working across disciplines, and every member has strong mathematical competencies. The present proposal forwards a rigorous approach leveraging Cognitive-Neurological Digital Twins (CNDT), which can be tailored with user and operational environment metadata or connected to real-time neural data for greater fidelity. This proposal acknowledges that formal methods and guarantees in both MR and cognitive modeling are a relatively unexplored proposition and specifies flexibility as our approach and team gain traction on this exciting, hard problem. We will provide elegant models of sufficient fidelity and generalizability to assist the warfighter in the MR-assisted missions to come.

Upon obtaining human subjects' research approval, we will build a study test and evaluation MR environment, which will include at least two distinct long-duration missions: taking control of a known building and search and rescue. Each will be fine-tuned in collaboration with our military consultant, who has extensive expertise in both simulation and leadership on the battlefield. During development, we will develop, test, and evaluate cognitive attacks in two categories. The first, Physiological MR Attacks, will explore such attacks as Postural Instability, Sense/Net Photogenic Triggers, and Haptic Feedback Misuse. The second category, Confidence Attacks, will include attacks such as Grey Signal Attacks overwhelming meaningful data, Perceptual Manipulation Attacks (PMA) moving ground truth, and Adaptive Trust Manipulation directly eroding or building up detrimental levels of user trust.

4 PROFESSIONAL ACTIVITIES

4.1 SERVICE TO THE SCIENTIFIC COMMUNITY

4.1.1 REVIEWER OF SCIENTIFIC PROPOSALS FOR FEDERAL AGENCIES

- **National Science Foundation (NSF) Panelist, Accelerating Research Translation (ART) program, 2026:** Invited by NSF to participate as a panelist for the

Directorate for Technology, Innovation and Partnerships (TIP). Reviewed proposals and participated in the discussion to make funding recommendations.

- **National Science Foundation (NSF) Panelist, Human Networks and Data Science (HNDS-R) program, 2025:** Invited by NSF to participate as a panelist for the Computer and Information Science and Engineering. Reviewed proposals and participated in the discussion to make funding recommendations.
- **Department of Energy (DOE) reviewer, Office of Advanced Scientific Computing Research (ASCR) within the Department of Energy Office of Science, EXPRESS: 2024 Exploratory Research for Extreme Scale Science, 2024:** Invited by DOE to participate as a reviewer. Reviewed proposals and provided written evaluations and recommendations.
- **National Science Foundation (NSF) Panelist, Human Networks and Data Science (HNDS-I) program, 2024:** Invited by NSF to participate as a panelist for the Computer and Information Science and Engineering. Reviewed proposals and participated in the discussion to make funding recommendations.
- **NSF Panelist, Human Networks and Data Science (HNDS-I) program, 2023:** Invited by NSF to participate as a panelist for the Computer and Information Science and Engineering. Reviewed proposals and participated in the discussion to make funding recommendations.
- **NSF Panelist, Secure and Trustworthy Cyberspace (SaTC) Program - Information Integrity/Privacy panel, 2023a:** Invited by NSF to participate as a panelist for the Computer and Information Science and Engineering. Reviewed proposals and participated in the discussion to make funding recommendations.
- **NSF Panelist, Secure and Trustworthy Cyberspace (SaTC) Program - Information Integrity/Privacy panel, 2023b:** Invited by NSF to participate as a panelist for the Computer and Information Science and Engineering. Reviewed proposals and participated in the discussion to make funding recommendations.
- **NSF Panelist, HBCU-UP RIA panel, 2023:** Invited by NSF to participate as a panelist for the Historically Black Colleges and Universities - Undergraduate Program (HBCU-UP): 2022 Research Initiation Awards (RIA) Program. Reviewed proposals and participated in the discussion to make funding recommendations.
- **NSF Panelist, CNS - CISE MSI Research Expansion, 2021:** Invited by NSF to participate as a panelist for the Computer and Information Science and Engineering Minority-Serving Institutions Research Expansion Program (CISE-MSI Program). Reviewed proposals and participated in the discussion to make funding recommendations.
- **NSF Panelist, Innovation Corps program, 2010:** Invited by NSF to participate as a panelist for the Innovation Corps Sites program. Reviewed proposals and participated in the discussion to make funding recommendations.

- **Reviewer for FOM:** Reviewed a proposal for the Foundation for Fundamental Research on Matter (FOM), the largest government-supported physics organization in the Netherlands.

4.1.2 LEADERSHIP ON RESPONSIBLE AND ETHICAL USE OF ARTIFICIAL INTELLIGENCE

- **Organizer of Human-Centered Artificial Intelligence In Training, Simulation and Education** ¹⁹, panel, 2022 Interservice/ Industry Training, Simulation and Education Conference, Orlando FL, December 1st, 2022.

Recent events, from reinforcement learning algorithms beating humans in aerial dog-fighting to AI co-piloting the U-2, demonstrate the growing role of AI in defense. However, continuing high-profile problems have demonstrated the need to rethink AI development and implementation, from focusing on algorithm capabilities to repositioning humans at the center of AI systems, augmenting rather than replacing humans, and providing applications that are reliable, safe, and trustworthy. While such human-centered AI (HCAI) principles have significantly improved AI systems at technology companies, governments, and defense policies, much remains to be done. At this session, attendees will gain a thorough understanding of the need for a human-centered approach to AI, practical implementation strategies, and an understanding of the benefits of HCAI.

- **Co-author, Six Human-Centered Artificial Intelligence Grand Challenges** ²⁰. Widespread adoption of artificial intelligence (AI) technologies is substantially affecting the human condition in ways that are not yet well understood. Negative unintended consequences abound, including the perpetuation and exacerbation of societal inequalities and divisions via algorithmic decision-making. We present six grand challenges for the scientific community to create AI technologies that are human-centered, that is, ethical, fair, and enhance the human condition.

4.1.3 LEADERSHIP IN CREATING A NEW SCIENTIFIC DISCIPLINE: INVERSE GENERATIVE SOCIAL SCIENCE

- **Guest Editor for Journal Special Issue on Inverse Generative Social Science (IGSS)** ²¹. This Special Section of the Journal of Artificial Societies and Social Simulation (JASSS) is a direct result of two International Workshops we co-organized in 2020 and 2021 and of the Special Panel on iGSS held in 2022 at the SCC Conference in Milan, Italy. The papers collected here were chosen by us from the Workshops and Panel to highlight the power and breadth of the inverse generative method for developing—and particularly for evolving—explanatory agent-based models.

¹⁹I/ITSEC 2022 Panel: <https://exhibits.iitsec.org/2022/Public/SessionDetails.aspx?FromPage=Sessions.aspx&SessionID=7396&SessionDateID=125>

²⁰International Journal of Human-Computer Interaction, 39:3, 391-437: <https://www.tandfonline.com/doi/full/10.1080/10447318.2022.2153320>

²¹Journal of Artificial Societies and Social Simulation, Volume 26, Issue 2 Published on 31 March 2023: <https://www.jasss.org/26/2/contents.html>

- **Organizer of the 1st and 2nd Workshops on methods for Inverse Generative Social Science (IGSS)** ²², MITRE, Washington, DC, January 23-25, 2020; and Virtual June 8-10, 2021. In these workshops, we were fortunate to be able to bring some of the leaders of the Computational Social Sciences field to survey activities and tools, identify the main challenges (theoretical and empirical) opportunities for further advancement, and establish a Working Group to maintain a critical mass of collaborators in this field:

- **Co-Organizers:**

- Robert Axtell (GMU/SFI)
- Joshua M. Epstein (NYU/SFI)
- Ivan Garibay (UCF)
- Matt Koehler (MITRE)
- Bill Rand (NCSU)
- David Slater (MITRE)

- **Why is this important now?**

Agent-based models are emerging as important tools for studying bottom-up processes and mechanisms in the social sciences. Given a macrosocial pattern—a wealth distribution, a disease time series, a spatial segregation pattern, a financial crash—the forward problem for ABMs is what rules of behavior and interactions are sufficient to generate the pattern.

The inverse problem for ABM is not to craft entire agents but rather to encode the space of possible agent constituents (rules, parameters) and possible mathematical and logical concatenations and search this large space for the agent parameterizations that most closely reproduce empirical data, using Genetic Programming, Decision Trees, Causal State Modeling, Associative Rules and other techniques from Machine Learning and AI. Agents thus become outputs of the model.

During this Workshop, we (a) survey activities in this area and the tools available, (b) identify the main challenges (theoretical and empirical) and opportunities for further advancement, and (c) find a Working Group to maintain a critical mass of collaborators in this field. We will also design a Prospectus for an edited volume on Inverse Methods for ABMs.

4.1.4 LEADERSHIP IN EMERGING DISCIPLINE: MIS-INFORMATION DYNAMICS

- **Organizer of INFORMATION WARFARE: Combating Disinformation Via Inoculation Training and Social Simulations** ²³, panel, 2022 Interservice/ Industry Training, Simulation and Education Conference, Orlando FL, December 1st, 2022.

²²Inverse Generative Social Science Workshop: <https://www.igss-workshop.org>

²³I/ITSEC 2022 Panel: <https://exhibits.iitsec.org/2022/Public>

The integrity of a society is one of the most important points of stability that must be maintained. Developments of online social networks allow users to propagate content faster with new advancements. With the potential for disinformation to proliferate, it is vital to be able to assess the impact that it can have since it would be a waste of resources to address every possible example of malicious information. In the effort to model society and how information can shape or direct it, simulations will be of the essence. Given that a collection of individuals works together, it is a natural choice to consider agent-based simulations as a representation of citizens, and after training the system, it can be used to explore plausible scenarios. The program will showcase new approaches and the results that can be delivered. Challenges and new prospects will be discussed by experts with a wealth of experience in the field. Key techniques that have proven to be effective are integrating entropic measures, adaptive societal segmentation, and deep learning in an agent context.

- **Organizer of 7TH INTERNATIONAL WORKSHOP ON SOCIAL SENSING SPECIAL EDITION ON INFORMATION OPERATIONS AND BELIEF DYNAMICS ON SOCIAL MEDIA AN ICWSM 2022 FULL-DAY WORKSHOP** ²⁴

- **Co-Organizers** We are working with leading researchers in the field of social media modeling, including two PIs of the DARPA SocialSim program:

- Dr. Kristina Lerman, General Co-Chair, Dept. of Computer Science, USC Viterbi School of Engineering
- Dr. Ivan Garibay, General Co-Chair, Dept. of Industrial Engineering and Management Systems, UCF
- Dr. Christian Lebiere, Program Co-Chair, Dept. of Psychology, Carnegie Mellon University
- Dr. Yanbing Mao, Program Co-Chair, Dept. of Mechanical Science and Engineering, UIUC

- **Why is this important now?**

The social sensing workshop (started in 2015) is a multidisciplinary meeting place that brings together social scientists, computer scientists, cognitive scientists, and other disciplines interested in social media analysis around research that interprets social media as measurement instruments. Social media democratized information production, offering an unprecedented view into human habits, customs, culture, stances, and indeed descriptions of physical events that transpire in the world. They also give unprecedented opportunities to spread misinformation, influence opinion, change beliefs, distract from the truth, or advance specific agendas, hidden or overt. The potential of social media to influence populations has brought about an interest in understanding human belief dynamics and their relation to social media influence, whether utilizing

²⁴More information on the SocialSens workshop: <http://socialsens.web.illinois.edu/>

benign information sharing or coordination to alter people's opinions, emotions, behaviors, or understanding of events. What are the scientific foundations for modeling social media as a new communication, measurement, and influence channel? How to utilize information media signals to better understand social systems, communities, and each other? How to identify and mitigate misuse of this medium? What specifically can one measure or influence, what underlying theoretical framework allows one to do so, and what applications are enabled by the endeavor? Since measurement and influence operations are well-studied in many physical domains, what can one learn from the physical domain (e.g., signal processing literature, management systems, or process control) to enable novel social media analysis methods? This scope brings new interdisciplinary research challenges and opportunities at the intersection of communication, sensing, social network analysis, information theory, data mining, natural language processing, artificial intelligence, cognitive models, and social sciences.

- **Organizer of the 1st Workshop on Modeling and Simulation of Information and Misinformation Diffusion, Evolution and Dynamics in Social Media**, Auckland, New Zealand, May 9th, 2020. The goal of this workshop is to develop innovative approaches for (multi)agent-based modeling and simulation of (mis)information spread and evolution in the online information domain.²⁵
- **Co-Organizers** We are working with leading researchers in the field of social media modeling, including two PIs of the DARPA SocialSim program:
 - Mark Orr (UVA)
 - Emilio Ferrara (USC)
 - Ivan Garibay (UCF)
 - Gita Sukthankar (UCF)
 - Niloofar Yousefi (UCF)
- **Why is this important now?**

The quality and format of public information are now subject to 24-7 news cycles on multiple media platforms alongside oppositional and supportive user-generated commentary. Information security is critical in the global cyber information environment, where the internet and social media, as the primary sources of information and news, are actively used to influence opinion and activities, disseminate false information, and manipulate world perception. Therefore, it is crucial to study the information exchange dynamics to understand the reach of any information available online. However, modeling information exchange dynamics is a challenging problem due to complex, non-trivial individual and emergent collective human behaviors in receiving, processing, and transmitting information, and it requires the development of the next generation of multi-agent modeling approaches that incorporate theory and methods from multiple disciplines including network and computational social science, behavioral psychology, cognitive and learning sciences, big data science, artificial intelligence and machine learning, communication science, and information theory.

²⁵More information on the misinformation workshop: <https://www.cecs.ucf.edu/abm-idsms/>

4.1.5 SCIENCE BOARDS

- ASEMFL Academy of Science, Engineering and Medicine of Florida,
Associate Member (elected 2026), 2026 - present
- IISE IISE Annual Conference & Expo 2026, Data Analytics & Information Systems
 (DAIS) Track, Arlington, TX, May 16–19, 2026,
Track Chair, 2025 - 2026
- CAPS Complexity And Policy Studies Conference,
Member of the Board of Directors, 2017 - 2018
- CSSSA Computation Social Science Society of the Americas,
Member of the Board of Directors, 2016 - 2018
- ISIT 8th Simposio Internacional en Innovación y Tecnología ISIT2017,
Member of the Organizing Committee, 2017
- CSSSA Computation Social Science Society of the Americas,
Treasurer, 2016 - 2017
- ISIT 7th Simposio Internacional en Innovación y Tecnología ISIT2016,
Member of the Organizing Committee, 2016
- SDG Swarm Development Group (Swarmfest Conference),
Member of the Board of Directors, 2015 - Present

4.2 SERVICE AS EDITOR, ASSOCIATE EDITOR, OR MEMBER OF EDITORIAL BOARD

4.2.1 Journal Editorship, Editorial Board Member

- Humanities & Social Sciences Communications (Springer Nature), International Editorial Board, 2025-present.
<https://www.nature.com/palcomms/journal-information>
- Journal on Policy and Complex Systems, Editorial Board member 2018-2022

4.2.2 Journal Editorship, Associate Editor

- Journal on Policy and Complex Systems, Associate Editor, 2024-present

4.2.3 Journal Editorship (Special Edition Invited)

- Journal of Artificial Societies and Social Simulation, Special Editor for 2023.
<https://www.jasss.org/JASSS.html>
- Foundation of Genetic Algorithms, Special Editor for 2009

4.3 CONSULTING

- **Ricardo Palma University**, Lima Peru. Teaching a course: "INTRODUCCIÓN A LOS SISTEMAS COMPLEJOS, MODELOS BASADOS EN AGENTES Y LOS PROCESOS DE INNOVACIÓN E INVESTIGACIÓN". This course is to introduce

basic research concepts in complex systems and to create research capacity in complex systems topics among the students and faculty of this university. This course is intended to fulfill CECS/UCF goals: (1) create a bigger, better research enterprise and (2) increase the quality and quantity of graduate students by fostering relationships between UCF and this academic institution that would lead to research collaborations and to attracting talented graduate students for UCF. This course is sponsored by:

- United Nations University, Institute for Advance Studies (UNU-IAS)
- Universidad Ricardo Palma
- Instituto Peruano del Pensamiento Complejo Edgar Morin -IPCEM
- Centro de Competencias en Educación para el Desarrollo Sostenible, RCE Lima-Callao/UNU

4.4 INDUSTRY BOARDS

- **Advisory Board Member**, California-based venture-funded technology startup : Streamlyne <https://streamlyne.com>, 2018-2019.
Role: provide strategic advice to the CEO on information technology, entrepreneurship, electronic research administration, innovation, enterprise systems, sponsored research, and technology transfer in the higher education sector.
- **Advisory Board Member**, California-based venture-funded technology startup : Vivantech, 2016-2017.
Role: provide strategic advice to the CEO on information technology, entrepreneurship, electronic research administration, innovation, enterprise systems, sponsored research, and technology transfer in the higher education sector.
- Judge for the Park Maitland School Science Fair, Orlando Science Center 2016
- Judge for the Park Maitland School Science Fair, Orlando Science Center 2015
- Judge for the Park Maitland School Science Fair, Orlando Science Center 2014

4.5 OTHER ACTIVITIES

- **Conference Chair**: 10th North American Conference on Industrial Engineering and Operations Management, Orlando, Florida, USA, June 17-19, 2025.
- **Program Committee**: AAMAS 2021 : 20th Autonomous Agents and Multi-Agent Systems, London UK, May 3-7, 2021.
- **Program Committee**: CSS 2020 : The Computational Social Science Society of the Americas, Santa Fe, NM, Oct 8 – 11, 2020.
- **Program Committee**: AAMAS 2020 : 19th Autonomous Agents and Multi-Agent Systems, Auckland, New Zealand, May 9-13, 2020.
- **Program Committee**: CSS 2019 : The Computational Social Science Society of the Americas, Santa Fe, NM, Oct 24 – 27, 2019.

- **Technical Committee Chair:** 10th International Symposium of Innovation and Technology, ISIT2019, Urubamba-Cusco, Peru, July 22-23, 2019.
- **Program Committee:** CSS 2018 : The Computational Social Science Society of the Americas, Santa Fe, NM, Oct 25 – 28, 2018.
- **Program Committee:** CSS 2017 : The Computational Social Science Society of the Americas, Santa Fe, NM, Oct 19 – 22, 2017.
- **Program Committee:** CSS 2016 : The Computational Social Science Society of the Americas, Santa Fe, NM, Nov 17 – 20, 2016.
- **Program Committee:** CSS 2015 : The Computational Social Science Society of the Americas, Santa Fe, NM, Oct 29 – Nov 1, 2015.
- **Technical Committee Chair:** 6th International Symposium of Innovation and Technology, ISIT2015, Mar del Plata - Argentina, August 13-14, 2015.
- **Technical Committee Chair:** 5th International Symposium of Innovation and Technology, ISIT2014, Salamanca-Guanajuato. Mexico, October 20-22, 2014.
- **Technical Committee Chair:** 4th International Symposium of Innovation and Technology, ISIT2013, Urubamba-Cusco, Peru, November 25-27, 2013.
- **Chair, Organizer:** Workshop on Data Collection, Analysis and Modeling of Nanoparticle/Cell Interactions for Cancer Research, Orlando FL, October 11, 2013.
- **Chair, Organizer:** Swarmfest 2013, 17th Swarm Development Group's Agent-Based Modeling Workshop, Orlando FL, July 8-9, 2013.
- **Co-General Chair:** ISIT 2012, 3rd International Symposium on Innovation and Technology. Cusco, Peru, November 26-28, 2012.
- **Special Sessions Chair:** ISIT 2011, 2nd International Symposium on Innovation and Technology. Lima, Peru, November 28-30, 2011.
- **Technical Program Co-Chair:** ISIT 2010, 1st International Symposium on Innovation and Technology. Ica, Peru, November 29 - December 1, 2010.
- **Co-Chair:** FOGA X : Foundations of Genetic Algorithms. Sponsored by ACM SIGEVO. Orlando, Florida USA, January 9-11, 2009.
- **Co-Chair:** Complexity through Development and Self-organizing Representations Workshop, Genetic and Evolutionary Computation Conference (GECCO-2006), Seattle, Washington, USA, July 8-12, 2006.
- **Co-Chair:** Second Workshop on Self-organization in Representations for Evolutionary Algorithms: Building Complexity from Simplicity, Genetic and Evolutionary Computation Conference (GECCO-2005), Washington, D.C., USA, Jun 26, 2005.
- **Chair:** Workshop on Self-organization in Representations for Evolutionary Algorithms, Genetic and Evolutionary Computation Conference (GECCO-2004), Seattle, Washington, USA, Jun 27, 2004.

4.6 SERVICE TO THE DEPARTMENT, COLLEGE, UNIVERSITY

4.6.1 UNIVERSITY

2023-2025: Member, UCF Research Council

The Research Council recommends policies concerning the campus research strategy, activities, policies, facilities, personnel, and patents.

2023-2025: Senator, UCF Faculty Senate

Representing the College of Engineering and Computer Science. Senate receives periodic briefings by UCF's president and provost. Senate can provide input on all university matters, including strategic direction and university operations.

2019-2021: Administrative Duty: director of the *UCF's Artificial Intelligence and Big Data Initiative*

The *UCF's Artificial Intelligence and Big Data Initiative* ²⁶ was created by the UCF Vice President for Research and Dean of Graduate Studies Coordinate artificial intelligence and data-science research among university-wide internal stakeholders and represent UCF when meeting with industry, nonprofits, and government agencies. I have served as director of this university-wide initiative. As the lead, I was responsible for implementing the "Blue Ribbon Panel on Data Science" recommendations ²⁷, including: (i) creating industry partnerships, (ii) academic focus, (iii) creating an entry web portal and the (iv) pursue prominence, and (v) catalyzing the UCF's Artificial Intelligence and Data Science community by creating this initiative and installing a director. I conducted the artificial intelligence and data science initiative work with a three-pronged approach: (A) Creating a repository of AI/DS (research and education), (B) Initiating a seed-grant program, and (C) Initiating a virtual distinguished speaker series to promote research and industry partnerships. The purpose of (A) is to showcase the capabilities of the AI/Data Science community at UCF. The focus of (B) and (C) will be on COVID-19 topics and will attempt to catalyze the artificial intelligence and data community at UCF. I implemented (B) the COVID-19 seed grants program. This program provides \$175K in seed grants to UCF faculty working on artificial intelligence or data science approaches to the COVID-19 pandemic ²⁸. This initiative was a precursor of the current UCF's Artificial Intelligence initiative.

2016-2018: Administrative Duty: Special Advisor to UCF's Vice President for Research and Dean of Graduate Studies

Until 2016 Summer, I was the leader of *Project Wahoo: restructuring of UCF research administration business and infrastructure*. My office created this project while I was Director

²⁶Initiative announcement: <https://www.ucf.edu/news/ucf-launches-new-artificial-intelligence-and-big-data-initiative/>

²⁷Report at: <https://www.cs.ucf.edu/~garibay/PDFs/UpdatedBigDataFinalReport.pdf>

²⁸More information about this program at <https://www.ucf.edu/news/grants-available-for-covid-19-research-that-uses-artificial-intelligence-and-big-data/>.

of Technology and Innovation at ORC and championed by me until it was approved in early 2016 by the UCF Provost and was allocated approximately \$5,000,000.00 in internal funding. This is a large and complex project that involves a true study of UCF's current business model and practices in the areas that support research: Office of Research, Office of Finance and Accounting, Office of Compliance, and Technology Transfer. External expert consultants are currently conducting a comprehensive study of UCF's current business practices and will provide recommendations to implement changes in UCF's research support infrastructure. The goal is to bring UCF in line with the best practices in the industry to enable UCF's goals related to research output and provide first-class support to faculty members. My role is to serve as an advisor to Dr. Klonoff in all matters related to this project. We conduct semi-periodic meetings dedicated to discussing this project's progress and providing my feedback on the decisions being made and strategic directions being considered. I receive a stipend for this administrative duty.

2018: Learning Sciences Cluster: Search Committee Member

Serving the UCF Cluster's Initiative Debra Reinhart, Associate VP for Research and Scholarship, Director, Faculty Cluster Initiative

4.6.2 COLLEGE

2016-present: Administrative Duty: Program Director of the Master of Science in Data Analytics (MSDA)

I started the MSDA program in Fall 2016 with 17 students. Currently, we have graduated more than 240 students, and this Fall, 2024, the MSDA is projected to have 80 students. I created the industry advisory board with currently 37 companies supporting the program and recruited all students using usual marketing strategies and direct presentations to the industry. I also recruited one Assistant Director and one Associate Director to help manage this rapidly growing program. Reviewed so far over 800 student applications to make admission decisions. I promote the program via presentations to potential students, partners, and stakeholders. I convene and support the quarterly industry advisory board meetings, including the workings of the board and its three subcommittees: internships, curricula alignment, and advancement. I also created the internship program for the MSDA and actively recruited companies to provide internships. We created a capstone course with industry recruitment and participation. In the capstone course, we team students with industry partners to solve real-world problems with the participation of industry mentors. I regularly meet with a number of prospective students seeking information and with current students seeking advice. With the assistance of the Associate Director, I coordinate teaching assignments and teacher recruitment for the MSDA in collaboration with the Chairs of Computer Science and Statistics and Data Science. I also oversee the program logistics in collaboration with the Office of Continuing Education (e.g., classroom locations, advisory board meetings, etc.) and the recruitment of GTAs for the MSDA program. I am in charge of the budget allocated for the program and make decisions concerning growing the program in support of UCF goals in a responsible and sustainable manner.

- Search Committee Member, Associate Dean for Graduate Affairs, College of Engineering and Computer Science (CECS), April 2026.

4.6.3 DEPARTMENT

- **IEMS AI Committee Chair, December 2025 - present.**
- IEMS Chair Reappointment Committee Member, 2022.
- IEMS Promotion and Tenure Committee Member, 2022.
- IEMS Graduate Committee Member, 2016-Present.
- IEMS Faculty Search Committee Member, 2016-2017.

5 RECOGNITION AND AWARDS

5.1 Awards

- **UCF Luminary Award**, *Selected as a “UCF Luminary” for notable accomplishments in research, scholarship, or creative activity that advance the discipline and demonstrate significant impact clearly recognized nationally or internationally.* Nominated by the Department Chair and conferred by the UCF Office of Research; recognition ceremony at the UCF Fairwinds Alumni Center, Orlando, FL, October 20, 2026. University of Central Florida (2026).
- **Elected Associate Member, Academy of Science, Engineering and Medicine of Florida (ASEMFL)**, *“For pioneering work in artificial intelligence for modeling complex human behavior, including the development of inverse generative social science, evolutionary model discovery, green technological innovation, and AI for social resilience against disinformation and polarization.”* Induction at the ASEMFL Annual Meeting, University of South Florida, Tampa, FL, November 6–7, 2026. Academy of Science, Engineering and Medicine of Florida (2026).
- **UCF Teaching Incentive Program (TIP) Award**, *In recognition of outstanding contributions in teaching and learning.* One-time \$5,000 award plus \$5,000 permanent annual salary increase, effective August 7, 2026. Presented by the Vice Provost for Faculty Excellence. University of Central Florida (2026).
- **Outstanding Educator Award**, *In Recognition and Appreciation of his contributions to industrial engineering through computational social science, complex systems, and data-driven approaches, and serve to the industrial engineering and operations management profession.* Presented at the 10th North American IEOM Conference Awards Ceremony on June 18, 2025. UCF Fairwinds Alumni Center, Orlando, FL, USA. The Industrial Engineering and Operations Management (IEOM) Society International (2025).

- **Outstanding Professor Award**, *In Recognition and Appreciation of Outstanding Achievement and Contribution in Artificial Intelligence Research and Academic Program Development and Service to the Industrial Engineering Profession*. Presented at the Awards Dinner on May 11, 2023. JW Marriott Lima, Peru. The Industrial Engineering and Operations Management (IEOM) Society International (2023).
- **Research Incentive Award**, Award recognizing UCF faculty for outstanding research and scholarly work, UCF, (2022).
- **DARPA Riser**, Awarded to my student Ramya Akula. DARPA Risers are a class of 30 promising young scientists selected nationally by DARPA (2022).
- **Preeminent Postdoctoral Program**, Awarded \$25,000.00 to support a postdoctoral student, College of Graduate Studies, UCF, (2024).
- **Preeminent Postdoctoral Program**, Awarded \$25,000.00 to support a postdoctoral student, College of Graduate Studies, UCF, (2023).
- **Preeminent Postdoctoral Program**, Awarded \$25,000.00 to support a postdoctoral student, College of Graduate Studies, UCF, (2022).
- **Preeminent Postdoctoral Program**, Awarded \$25,000.00 to support a postdoctoral student, College of Graduate Studies, UCF, (2021).
- **Preeminent Postdoctoral Program**, Awarded \$25,000.00 to support a postdoctoral student, College of Graduate Studies, UCF, (2020).
- **Preeminent Postdoctoral Program**, Awarded \$25,000.00 to support a postdoctoral student, College of Graduate Studies, UCF, (2019).
- **Best Paper Award**, Conference of the Computational Social Science Society of the Americas, Santa Fe, NM, USA (2019).
- **Preeminent Postdoctoral Program**, Awarded \$25,000.00 to support a postdoctoral student, College of Graduate Studies, UCF, (2018).
- **Predictive Analytics Innovation Fellow**, Awarded \$5,000.00 stipend, Center for Higher Education Innovation in the Office of the President, UCF, (2017).
- **Preeminent Postdoctoral Program**, Awarded \$25,000.00 to support a postdoctoral student, College of Graduate Studies, UCF, (2017).
- **Mentoring Program**, accepted at the VP for Research and Dean of Graduate Studies faculty mentoring program, College of Graduate Studies, UCF, (2017).
- **Best Paper Award Nomination**, Genetic and Evolutionary Computation Conference, Washington, DC, USA (2005).
- **Hillman Fellowship Award** for Excellence in Ph.D. Research, University of Central Florida, Orlando, FL, USA (2003).

5.2 National Press Coverage

1. Antoine Hart (2026, September). Ivan Garibay, UCF NCTI Principal Investigator: NSF funds a pilot program to support small businesses in accelerating commercialization of late-stage deep-technology and avoid the “valley of death”. **EurekAlert!**

- (**AAAS**), **University of Central Florida**. <https://www.eurekalert.org/multimedia/1151789>
2. Jack Browne (2026, September 23). NSF Invests in Small Businesses with \$20M Two-Year Pilot. **Microwaves & RF**. <https://www.mwrf.com/resources/industry-insights/article/55407227/microwaves-rf-nsf-invests-in-small-businesses-with-20m-two-year-pilot>
 3. Dorothy Lepkowska (2026, September 17). NSF launches \$20M pilot to accelerate commercialization of promising deep technologies from small businesses. **EdTech Innovation Hub**. <https://www.edtechinnovationhub.com/news/nsf-launches-20m-pilot-to-accelerate-commercialization-of-promising-deep-technologies-from-small-businesses>
 4. Celeste Vance (2026, September 15). NSF Introduces \$20M Pilot to Close Deep-Tech Commercialization Gap. **ExecutiveGov**. <https://www.executivegov.com/articles/nsf-pilot-20m-close-deep-tech-commercialization-gap>
 5. NewsBeep (2026, September 15). NSF Funds Pilot Program to Support Small Businesses in Accelerating Commercialization of Their Late-Stage Deep-Technology and Avoid the “Valley of Death”. **NewsBeep (United States News Beep)**. <https://www.newsbeep.com/us/848521/>
 6. Mohib Ur Rehman (2026, September 14). NSF Launches \$20M Pilot for Deep-Tech Commercialization. **The Quantum Insider**. <https://thequantuminsider.com/2026/09/14/nsf-20m-pilot-deep-tech-commercialization/>
 7. Holly Klein (2026, September 14). NSF launches \$20M pilot to accelerate commercialization of promising deep technologies from small businesses. **OrangeSlices AI**. <https://orangeslices.ai/nsf-launches-20m-pilot-to-accelerate-commercialization-of-promising-deep-technologies-from-small-businesses/>
 8. National Science Foundation (2026, September 14). NSF launches \$20M pilot to accelerate commercialization of promising deep technologies from small businesses. **National Science Foundation (NSF)**. <https://www.nsf.gov/news/nsf-launches-20m-pilot-accelerate-commercialization>
 9. Beatriz Nina Ribeiro Oliveira (2023, March 27). Researchers identify 6 challenges humans face with artificial intelligence. **Tech Xplore**. <https://techxplore.com/news/2023-03-humans-artificial-intelligence.html>
 10. University of Central Florida (2023, March 27). Researchers Identify 6 Challenges Humans Face With Artificial Intelligence: Study identifies six factors humans must overcome to insure artificial intelligence is trustworthy, safe, reliable, and compatible with human values. **Neuroscience News**. <https://neurosciencenews.com/human-ai-22882/>
 11. Beatriz Nina Ribeiro Oliveira (2023, March 28). 6 Challenges – Identified by Scientists – That Humans Face With Artificial Intelligence. **SciTechDaily**. <https://scitechdaily>

- ly.com/6-challenges-identified-by-scientists-that-humans-face-with-artificial-intelligence/
12. Alex McFarland (2022, December 9). New AI Detects Sarcasm in Social Media. **Unite.AI**. <https://www.unite.ai/new-ai-detects-sarcasm-in-social-media/>
 13. Zenaida Gonzalez Kotala (2021, May 6). Researchers develop artificial intelligence that can detect sarcasm in social media. **AAAS; EurekAlert!** https://www.eurekalert.org/pub_releases/2021-05/uocf-rda050621.php
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