

Paul Amoruso, M.S.

UCF Ph.D. Candidate

UCF ECE Future Faculty Laureate (FFL) 2024-2026

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I. Objectives

To pursue an *Assistant Professor position at a high Research Activity (RI) institution* upon attaining my doctorate in computer engineering.

To do so, I am conducting an academic program spanning:

- *ECE technical topics* (artificial intelligence and its computational acceleration with FPGAs),
- *integrative cross-disciplinary research* (novel application of AI to autonomously adaptive micro-credentialing and learner remediation), and
- *acquisition of instructional abilities* (teaching assistant, formal educational coursework, and authoring/reviewing STEM publications).

II. Education

Ph.D., Computer Engineering

Fall 2023-Present

ECE Department, University of Central Florida, Orlando, FL, GPA: 4.0/4.0 Advisor: Dr. Ronald F. DeMara

M.S., Computer Engineering

Spring 2022- Spring 2023

ECE Department, University of Central Florida, Orlando, FL, Advisor: Dr. Ronald F. DeMara Thesis Title: "Micro-Credentialing with Fuzzy Content Matching: An Educational Data-Mining Approach"

B.S., Computer Engineering

2017-2021

ECE Department, University of Central Florida, Orlando

III. Professional Experience

A. Research Experience

Computer Architecture Laboratory

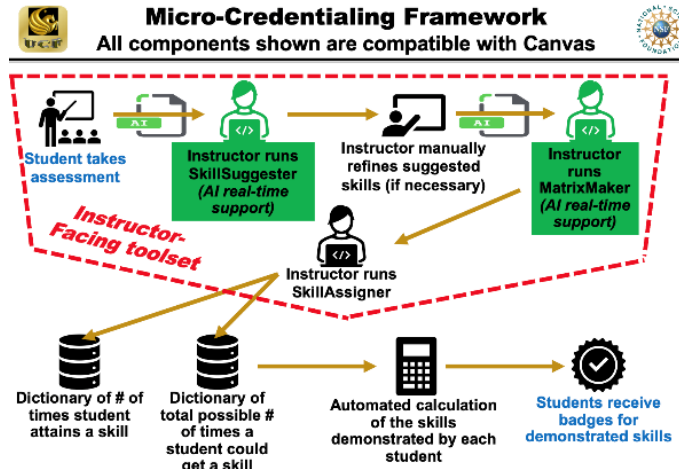
Multiple semesters since 2022

Graduate Research Assistant, NSF Large-scale Research Grant ECE Dept., University of Central Florida

- As lead technical GRA on a 5-year NSF grant, I researched novel applications of *Assistive AI* to automate student micro-credentialing, as well as the novel application of *Generative AI* for post-assessment remediation. My research and publications spanned both AI/processing aspects in the ECE domain and instructional delivery topics in the STEM educational domain.
- Innovated an *instructor-facing toolset* for identifying each student's competencies within STEM courses and researched a design that can facilitate acquisition of employer-focused skills for students to achieve incrementally throughout a course. Resulted in an ASEE publication as lead author.
- Developed an *agent-based-model* for identifying the Optimal Remedial Staffing to Achieve Learning Outcomes within Cost Constraints. This spanned objective metrics such as learning outcomes, processing load, predictor for GTA staffing, and correlation with results in-practice when applied to an ECE course at UCF. Resulted in a Computation Society publication as lead author.
- Researched a *feature-oriented cellular automata-based learning mechanism* for convolution-free image classification. Resulted in an IEEE publication as co-author.
- Mentored senior design team of CS undergraduates. Proposed the project topic and advised the students bi-weekly to

develop Python and Rest-API technologies to create a novel student dashboard regarding learners’ post-assessment remediation

- Currently prototyping a Python-based framework to utilize Generative AI to prime and level out each learner’s knowledge gaps prior to meeting with human tutors to review their handwritten scratch sheets. Investigating campus-wide Canvas integration with collaborator/mentor from UCF CDL. Will analyze processing throughput at institutional-scale and acceleration methods including FPGA, parallel CPU/GPU cores, and others.



Context Diagram of Micro-Credentialing Research (lead GRA of the project)

B. Teaching Experience.....

EEL3801 Computer Organization

Summer 2022- Summer 2024

Graduate Teaching Grader (GTG)

ECE Dept., University of Central Florida

Received **Best Graduate Teaching Assistant Award in ECE Department at UCF of 2023** in consideration of:

- Tutoring students via post-test remediation sessions in EPC and/or ECE labs
- Spearheaded a technical initiative to investigate operational flow in migration from “Classic Quiz” Canvas LMS quizzes to the "New Quiz" format. This was provided to UCF Digital Learning and has been utilized by multiple UCF CECS faculty
- Substitute instructor for a session of the lab in EEL3801 to accommodate sudden unavailability of the lab GTA
- Directed and managed up to 4 UTAs performing post-assessment remediation four days per week

EGS1006 Introduction to Engineering

Fall 2019

Undergraduate Teaching Assistant (UTA)

CECS, University of Central Florida

- Lead laboratory session of up to 40 students for three days each week
- Responsible for managing and grading assignments for about 120 students during the semester.
- Consisted of teaching the steps to build and program the TI-RSLK Unit and then application testing where it navigates through a maze

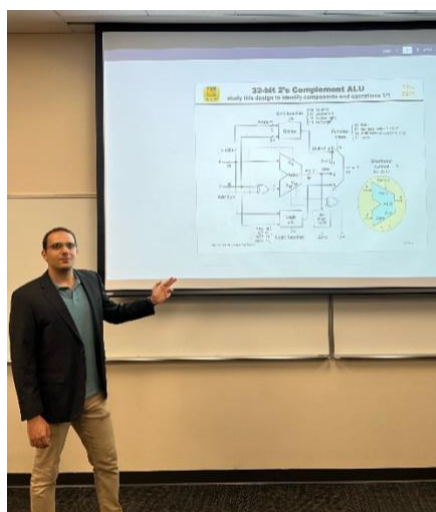
High-School Honors Biology

2017

Student Assistant

Lake Brantley High-School

- Responsible for grading student in class and homework assignments.
- Prepared and organized laboratory experiments for student's
- Supported biology teacher with audio/ visual technologies



Course Delivery – STEM Undergraduate Courses

(EEL3801 GTA / Guest Lecturer, EGN1006 Undergraduate Teaching Assistant, UCF Invited Seminar Speaker)

C. Mentoring Experience.....

Advising and Mentoring of undergraduate Students

Computer Science Senior Design, University of Central Florida

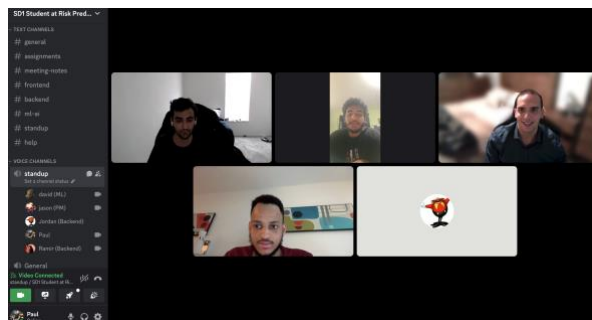
Senior Design Project - Technical Advisor

Spring 2024 – Fall 2024:

1. Jason Saini, BSCS student
2. Justin Gamboa, BSCS student
3. Jordan Morillo, BSCS student
4. Ramir Dalencour, BSCS student
5. David Santamaria, BSCS student

Spring 2025 – Present:

1. Marco Gerena, BSCS student
2. Andres Quintero, BSCS student
3. Chaya Jasculca, BSCS student
4. Kota Ramsey, BSCS student
5. Nicolas Sanchez, BSCS student



Technical Mentoring – Aspiring Undergraduate and Graduate Students at UCF

(COP4934 Senior Design I, COP4935 Senior Design II, approximately 10 GTAs/UTAs in UCF ECE Department)

IV. Professional Training and Course Design.

A. Formal Coursework.....

- Completed *EME6613: Instructional System Design*. This UCF Graduate course covered systematic analysis and design of instruction. Completed group project on developing a higher education course analysis and treatment plan for teaching Punctuality and Time Management skills.
- Completed *UCF's Preparing Tomorrow's Faculty* course. This UCF Graduate Studies development course covers a comprehensive approach to student learning and motivation involves integrating course design with effective teaching pedagogies, using ongoing assessment and feedback, and fostering a positive course climate that supports students' career development including the preparation of a teaching philosophy statement.
- Completed EEL 6938: *Special Topics in ECE: Professional Communications for Engineers*.

B. Course Enhancement and Development

Computer Organization and Design.

Summer 2022-Spring 2023

Course Content Development.

University of Central Florida

- Supported implementation of using Canvas add-ons, including UCF Here for measuring student attendance
- Resolved technical complexities for course migration from Classic to New quiz format
- Utilized python scripts leveraging Canvas REST API for downloading student and validating student grades
- Developed scripts for automatically anonymizing student quiz submissions to adhere to FERPA cognizant approaches in remediation

V. Publications

A. Conference Publications.....

i. Technical Manuscripts:

5. **P. Amoruso**, R. Yarnell, and R. F. DeMara, "Compression-Based Feature Clustering using HLS for Low-Footprint FPGA Text Classification," in-preparation for submission to ACM Computer-Aided Design Journal.
4. R. Yarnell, **P. Amoruso**, and R. F. DeMara, "Machine Learning Optimization for Neuromorphic Acceleration: High-Level Synthesis and Design Space Exploration Techniques," submitted to *Great Lakes Symposium on VLSI (GLSVLSI)*, 2025.
3. R. Yarnell, **P. Amoruso**, and R. F. DeMara, "Metaheuristics for Multi-Objective Optimization in Reconfigurable Fabrics Using High-Level Synthesis," submitted to *Great Lakes Symposium on VLSI (GLSVLSI)*, 2025.
2. **P. Amoruso**, I. Garibay, L. O. Campbell, J. A. Mejia, F. E. Hernandez, and R. F. DeMara, "IUSE:HSI: A NetLogo-based Approach to Predictive Estimation of Student Performance and Corresponding Tutoring Demand within STEM Undergraduate Courses," paper submission to *ASEE 2025 Annual Conference*.
1. N. Ari, R. Yarnell, **P. Amoruso**, J. Mell, and R. DeMara, A. Wu, "FOCAL: Feature-Oriented Cellular Automata Learning for Convolution-Free Image Classification," in *Proceedings of 12th IEEE International Conference on Intelligent Systems (IEEE-IS)*, Varna, Bulgaria, August 29-31, 2024.

ii. STEM Educational Manuscripts:

7. **P. Amoruso**, and R. F. DeMara, “Progressing from Micro-Credentialing to Micro-Recruiting: Connecting Employers with Ideally-Badged Learners via Last-Stage Invocation of GenAI,” submitted to 2025 IEEE Frontiers in Education Conference.
6. **P. Amoruso** and R. F. DeMara, “Compression-Assisted Zero-Shot Prompting of Large Language Models (LLMs) for Educational Skill Classification of Microprocessor Curricula,” submitted to *Great Lakes Symposium on VLSI (GLSVLSI)*.
5. **P. Amoruso**, B. Chen, R. F. DeMara, “GenAIprime: Generative AI for Remediation-Priming of Knowledge Gaps by Dynamically Creating Multimedia Learning Resources,” Presented at *15th IEEE Integrated STEM Education Conference (ISEC)*, Princeton University, NJ, USA, March 15, 2025.
4. **P. Amoruso**, L. O. Campbell, R. F. DeMara, “Automated Micro-Credentialing and AI-Enhanced Remediation for Online STEM Assessments,” presentation in-preparation at *2025 Florida Online Innovation Summit (FOIS)*, University of Central Florida, FL, USA, April 10, 2025.
3. **P. Amoruso**, I. Garibay, R. F. DeMara, “Agent-Based Model for Optimal Remedial Staffing to Achieve Learning Outcomes within Cost Constraints,” Poster presentation at *Computational Social Science Society of the Americas (CSSSA) Annual Conference*, Santa Fe, NM, USA, October 24-27, 2024. **Recognition: Best Poster Award of Conference**
2. **P. Amoruso**, O. Garibay, L. O. Campbell, and R. F. DeMara, “Instructor-Facing Graphical User Interface for Micro-Credential Designation and Refinement in STEM Curricula, in *Proceedings of 2024 ASEE Southeast Section Annual Meeting*, Marietta, Georgia, March 10 – 12, 2024. 10.18260/1-2—45539.
1. **P. Amoruso**, R. F. DeMara, L. O. Campbell, F. Hernandez, and A. Mejia, “Personalizing Digitized Assessments and Remediation using an Automated Micro-Credentialing Framework,” *Online Learning Consortium (OLC) 2022 Conference on Accelerating Online Learning Worldwide*, Orlando, FL, Nov. 15, 2022.

B. Journal Publications.....

1. **P. Amoruso**, R. DeMara, and L. O. Campbell, “AchieveUP: Personalizing Digitized Assessments and Remediation using an Automated Micro-Credentialing Framework for Canvas LMS,” in-preparation for submission *ASEE Computers in Education (COED) Journal*.

VI. Honors and Awards

A. Scholarships and Fellowships

- **David T and Jane M Donaldson Perpetual Memorial Scholarship**, College of Engineering and Computer Science, 2025-2026.
Monetary Amount: \$2,000
- **Future Faculty Laureate**, Electrical and Computer Engineering Dept., 2024-2026.
Monetary Amount: \$12,000 discretionary budget
Description: Provides bright and promising ECE graduate students having aptitude for academic employment with opportunities to learn how to conduct various faculty activities

including teaching a class as an instructor of record, grant proposal writing, course materials development, instructional technologies, undergraduate/graduate technical mentoring, NSF programs solicitations/processes including meeting with CAREER awardees, and attendance at STEM Educational Conferences, and the academic hiring process.

A budget \$12K over two years is provided to support progression through eight key milestones: obtaining teaching assistant experience, completing formal training in educational skills, implementing course enhancements, authoring STEM publications, participating in professional events, mentoring undergraduate learning assistants, delivering a UCF ECE course as instructor of record, and gaining immersion in funding proposal processes.

B. Awards

- **Best Graduate Teaching Assistant Award**, UCF Electrical and Computer Engineering Dept., 2023.

Monetary Amount: \$500

Graduate Teaching Assistants (GTAs) from the Electrical and computer engineering department were auto selected to compete in the award. Excellence in serving as a Graduate Teaching Assistant is demonstrated by evidence from student survey responses.

- *UCF Three Minute Thesis (3MT) Competition*, university-level finalist: Nov. 14, 2022
- *UCF CECS Senior Design Day Showcase*, First Place Award for ECE Projects: Fall 2021
- *Dean's List*, University of Central Florida: 2018, 2019, 2020, 2021
- *ACM Complimentary Membership*, bestowed for reviewer service: May 2024
- *President's Honor Roll*, University of Central Florida: Spring 2020 - Fall 2020

C. Industry Collaboration

- **In-Kind Contribution**, *Adzuna Inc.* API access, market value \$2000 academic pricing plan, March - April 2025.

VII. Professional Service

A. Technical Paper Reviewer/Referee.....

- Technical Paper Reviewer for *ACM Winter Simulation Conference 2024 Education Track*.
- Technical Abstract Reviewer for *ASEE National Conference 2024 NSF Grantees Poster Session*.
- Technical Paper Sub-Reviewer for the 2025 *Great Lakes Symposium on VLSI (GLSVLSI)* Microelectronic Systems Education Workshop

B. Membership and Leadership of Student Organizations.....

Student Laureates of STEM Teaching and Learning (SLSTL), Vice President of Registered Student Organization at the University of Central Florida, Fall 2023 - Present.

Computer Hardware Innovation and Design Association (CHIDA), President of Registered Student Organization at the University of Central Florida, Fall 2023 - Present.

C. Professional Society Memberships.....

- *Institute of Electrical and Electronics Engineers (IEEE)* Student Member, Fall 2024 - present

- *American Society of Engineering Education (ASEE)* Student Member, Fall 2024 – present
- *Computational Social Science Society of the Americas (CSSSA)* Student Member, Fall 2024 – present

VIII. Presentation/Participation in Conferences/Seminars

- PowerPoint presentation at *ISEC*, Princeton University, NJ, USA, March 15, 2025.
- PowerPoint presentation at UCF Computer Science Senior Design course: Sponsorship Pitches 1/08/2025
- Poster presentation at *CSSSA*, Santa Fe, New Mexico, October 24-27, 2024.
- PowerPoint presentation at *ASEE-SE*, Marietta, Georgia, March 10-12, 2024.
- PowerPoint presentation at UCF Computer Science Senior Design course: Sponsorship Pitches 1/17/2024
- Online Learning Consortium (OLC) Accelerate Symposium, Technical Submission PowerPoint presentation, Orlando, Florida, November 1-3, 2022.

IX. Seminars and Invited Talks

- The Need for Priming Presenters for Large Presentations, May 2nd, 2025, Computational Social Science Society of the Americas (CSSSA) Board Meeting, Virtual
- Concepts on Increasing Student Involvement: A Student-Led Project Mentorship Initiative, March 21, 2025, Computational Social Science Society of the Americas (CSSSA) Board Meeting, Virtual
- From Curiosity to Complexity: Paul Amoroso's Journey into Agent-Based Modeling, October, 26th, 2024, The Flux by Epistemix, Santa Fe, New Mexico
- Perspectives on Graduate Teaching Assistantships spanning challenges and successes, August 23, 2024, ECE GTA Orientation, UCF, Orlando, Florida
- Engineering Initiative Meeting on Integrated Course Search and Credentialing for Higher-Education, November 5, 2024, Center for Distributed Learning (CDL) meeting, UCF, Orlando, Florida

X. Certificates

- IDS 6513 *Preparing Tomorrow's Faculty*- Higher Education Teaching Program, Fall 2024

XI. Technical and Language Skills

SonicWall accredited sales engineer and support engineer ▪ Desktop support in PC & Mac computers
 ▪ Familiar with programming the TI-RSLK ▪ Work well in groups & related projects ▪ Wireshark (Static / Live Analysis) ▪ Constructing Websites and Software Applications ▪ Proficient with teaching students how to program a TI-RSLK ▪ MacOS ▪ Machine Learning applications ▪ Microsoft Office ▪ Microsoft Project ▪ SQL Server ▪ Linux Ubuntu/Kali ▪ CVAT ▪ PyTorch ▪ NVIDIA Jetson Nano image classification toolsets ▪ REST API ▪ Vitis-HLS

Programming Language:

C, C++, Verilog, Assembly, Python, MATLAB, HTML, XML, Java, MIPS Assembly language, Swift

Language:

English (Native), Italian (Fluent), Spanish (Familiarized)

XII. Internships and Industry Experience

Junior Consultant

EMA Computers, Inc.

Dec 2015 - present

Altamonte Springs, FL

- Computer setup and deployment
- Computer patch management
- Malware Mitigation: Effective Strategies for Eliminating Cyber Threats
- Designing and maintaining websites
- SEO (Search engine optimization)

XIII. Graduate Courses Completed

CDA5106: Advanced Computer Architecture

University of Central Florida

Spring 2021

COP5611: Operating Design Principles

University of Central Florida

Spring 2021

COT5405: Design & Analysis Algorithms

University of Central Florida

Spring 2022

EEL6812: Intro To Neural Networks

University of Central Florida

Spring 2022

CAP5610: Machine Learning

University of Florida (as a Traveling Scholar)

Summer 2022

EIN6258: Human Computer Interaction

University of Central Florida

Fall 2022

EEL5862: Real-Time Systems

University of Central Florida

Fall 2022

EEL6762: Perf Analy Comp & Com Systems

University of Central Florida

Spring 2023

CAP6675: Complex Adaptive Systems

University of Central Florida

Fall 2023

EEL5722: Field Program Gate Array FPGA

University of Central Florida

Fall 2023

EEL5706: Resilient Computer System Design

University of Central Florida

Spring 2024

ESI6535: Advanced Agent-Based Modeling

University of Central Florida

Spring 2024

EME6613: Instructional System Design

University of Central Florida

Summer 2024

EEL 6938: Professional Communications for Engineers

University of Central Florida

Fall 2024