Ronald F. DeMara, Ph.D., P.E.

Fellow of IEEE, AAAS, and AAIA

Pegasus Professor
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I. Technical Interests

Adaptive computer architectures with emphasis on reconfigurable and post-CMOS devices, evolvable and intelligent computing hardware, resilient and energy-aware logic design, and the digitization of STEM education.

II. Education

- Doctor of Philosophy – Computer Engineering

  University of Southern California – December, 1992
  Dissertation: *Parallelism, Design, and Performance of a Marker-Propagation Reasoning Architecture*
  Advisor: Dan I. Moldovan

- Master of Science – Electrical Engineering

  University of Maryland, College Park – May, 1989
  Emphasis: Digital Computer Systems

- Bachelor of Science – Electrical Engineering with High Honors

  Lehigh University – May, 1987
  Minor: Science, Technology, and Society

III. Professional Experience

1993 – present: University of Central Florida – Orlando, Florida

Department of Electrical and Computer Engineering

– ***Pegasus Professor:*** *2020 – present*
– ***Professor and Digital Learning Faculty Fellow*****:** 2018 – 2021
– ***Professor*****:** 2006 – 2017
– ***Professor and Program Coordinator*****:** Computer Engineering Program 1994 – 1995, 2011 – 2015
– ***Professor and Graduate Coordinator:*** December 2009 – August 2012
– ***Associate Professor*****:** 1999 – 2005

– ***Assistant Professor and Associate Department Chair*****:** 1995 – 1998

– ***Assistant Professor*****:** 1993 – 1998

Summary of Professional Outcomes in Academia

Since 1993, I have been a full-time faculty member in the Department of Electrical and Computer Engineering with a joint appointment in Computer Science and hold Pegasus Professor university-level professorship since 2020. I am a Fellow of *Institute of Electrical and Electronics Engineers (IEEE)* with citation: "For contributions to runtime reconfigurable computing and resilient datapath design" and a Fellow of *American Association for the Advancement of Science (AAAS)* with citation: "For outstanding contributions in computer systems design and architecture with emphasis on emerging computing devices for machine learning, adaptive and reconfigurable hardware, and digitization of STEM education" and a Fellow of the Asia-Pacific Artificial Intelligence Association (AAIA).

I conduct academic-, government-, and industry-based research on adaptive computer architectures to autonomously sustain their resilience, while dynamically adapting their energy consumption and quality of service. Computing system and datapath design contributions span from circuit-level up through architecture-level while advancing technologies ranging from microprocessor-based scalable computing, CMOS clocked and asynchronous datapath design, runtime reconfigurable field programmable logic and spintronic devices.

I have been Principal Investigator (PI) or co-PI of 50 funded projects totaling $14.2M of which roughly two-thirds was federally-sponsored including *National Science Foundation*, *NASA*, *U.S. Army / Navy / Air Force*, *Defense Modeling and Simulation Office*, *DARPA, National Security Agency, and Semiconductor Research Corporation*, and others. Their results on computer architecture, post-CMOS devices, and reconfigurable fabrics and intelligent and neuromorphic systems have been published in over 325 articles on technical and STEM education topics, and granted U.S. Patent #7,389,460.

I have taught 17 different courses listed in the UCF academic catalog, developed 11 new courses listed in catalog, and served as Program Coordinator academic programs. Performed program administration in Computer Engineering at the undergraduate and graduate levels, including Program Coordinator, Graduate Coordinator, Assessment Coordinator, and Department Associate Chair. Led laboratory enhancement within the department and at the college and university-level, and academic committee service at the department-level through the university-level. Led accreditation activities and strategic planning for the Computer Engineering program, including chairing faculty recruiting committees resulting in hiring of over 30 tenure-track faculty, lecturers, and staff.

I have completed as Advisor, 28 Doctoral graduates and 30 Masters graduates with thesis. Fourteen (14) of these graduates went on to full-time faculty positions in academic programs at college institutions nationally, including an ECE Department Chair and another as a Dean of Engineering. Other research advisee graduates' first employment included Intel, AMD, Qualcomm, Apple (hardware design division), L3/Harris, LMIS, and leading computer systems/architecture design firms and embedded computing developers.

I have conducted continuous service in IEEE, ACM, ASEE, and/or AAAS professional societies for over three decades as including ten terms as Topical Editor / Associate Editor / Guest Editor for *IEEE/ACM Transactions*, as an Editorial Board Member IEEE's flagship Spectrum monthly magazine, numerous Technical Program Committees/Executive Committees, and session organizer/chair, as well as reviewer. Service to National Science Foundation in multiple Directorates as both panelist and expert independent review contributor on multiple occasions. Served in international/national-level scholarship/fellowship selection, chaired committees for professional advancement, including award

criteria and recipient selection. I delivered IEEE conference Keynote Addresses including *IEEE RAW*, *IEEE ReConFig*, *IEEE IEMtronics*, and *IEEE iSES*.

I received the UCF *Research Initiation Award (University-level) three times*, *Distinguished Research Lecturer Award (College of Engineering)*, the *Advisor of the Year Award (College of Engineering)*, *Excellence in Undergraduate Teaching Award (College-Level)*, *Excellence in Graduate Teaching Award (ECE Department)*, twice received the *Researcher of the Year Award (ECE Department)*, *Teaching Initiative Award (College-level)* five times, and the *Scholarship of Teaching and Learning (SoTL) Award* three times (*University-level*), *Marchioli Collective Impact Award (University-level)* for transformative impact, *Digital Learning Faculty Fellow (singular at University-level), Excellence in Doctoral Mentoring Award* (*University-level*), *Pegasus Professor Award* ('University Professorship' rank), and the *Online Learning Consortium (formerly Sloan) Effective Practice Award*, along with numerous best paper recognitions and *IEEE Transactions* of the Month.

I received the *Joseph M. Biedenbach Outstanding Engineering Educator Award* from IEEE in 2008. In 2022, I was elected Fellow of *American Association for Advancement of Science (AAAS)* with citation: "For outstanding contributions in computer systems design and architecture with emphasis on emerging computing devices for machine learning, adaptive and reconfigurable hardware, and digitization of STEM education." In 2025, I was elevated to Fellow of *Institute of Electrical and Electronics Engineers (IEEE)* with citation: "For contributions to runtime reconfigurable computing and resilient datapath design."

2002: NASA Ames Research Laboratory – Mountain View, CA (UCF Sabbatical Period)

Visiting Research Scientist, Evolvable Hardware Program

Conducted research in Autonomous FPGA Repair techniques. Developed evolutionary computation approaches using Genetic Algorithms to regain lost functionality due to stuck-at-faults and other permanent failures in Xilinx SRAM FPGA platforms. Contributed to three conference papers on the topic, including technical approach, experimental system, and research results.

1989 – 1992: University of Southern California – Los Angeles, California

Research Assistant, Department of Electrical Engineering-Systems

Conducted research in High Performance Computer Architectures for Knowledge Processing applications. Developed the SNAP-1 Multiprocessor, a 144-CPU DSP system for real-time speaker-independent continuous speech processing, including processor configuration, interconnection network, and performance monitoring strategy. Research in performance modeling and assessment of hybrid SIMD/MIMD architectures.

1986 – 1989: IBM Corporation – Manassas, Virginia

Associate Engineer, Federal and Complex Systems Division

Specification, design, and capacity analysis of telecommunication systems. Responsibilities included performance modeling using SIMSCRIPT/NETWORK-II.5, processor selection, connection topology, redundancy/availability analysis, and technical proposal development. Lead systems architect for fly-by-wire Automated Inventory Management system. Site representative to IBM division-level steering committee on systems engineering workstation environments.

IV. Teaching Activities

A. Teaching Summary

Taught 17 different courses, including development of 10 new courses added to the catalog, and served as Computer Engineering degree Program Coordinator. Active in developing STEM curricula with educational contributions and publications regarding:

- Digitally-Mediated Team Learning (DMTL),
- sustainable curriculum renewal in STEM,
- flipped classroom pedagogies and tools,
- digitization of STEM assessments,
- remediation with Socratic video blogs,
- innovations in remediation and tutoring, and
- individualized, adaptive, and personalized learning pedagogies.

B. Courses Taught

Taught courses in lecture, recitation, and seminar-style formats at Undergraduate (EEL3xxx/4xxx) and Graduate (EEL5xxx/6xxx) levels with [class size] as listed:

1. EEL3801: *Computer Organization* [70][140]
   – ALU, control path, memory design, instruction set architectures, assembly lang.
2. EEL4767: *Computer System Design I with Laboratory* [40]
   – Computer Organization, Microprocessor Systems
3. EEL4768: *Computer System Design II with Laboratory* [30]
   – Computer Architecture, Data Path Design
4. EEL4851: *Engineering Data Structures with Laboratory* [50]
   – Data Structures and Algorithms in C++ and now Java
5. EEL4882: *Engineering Systems Software* [30]
   – Operating Systems Concepts, Process Scheduling, Resource Management
   – offered in live-only and live-with-web-based formats
6. EEL4817: *Machine Learning I* [15]
   – Decision Trees, Evolvable Hardware, Neural Networks
   – Team taught with 3 faculty: taught module on Evolvable Hardware
7. EEL4818: *Machine Learning II* [10]
   – Honors course for undergraduates developing Machine Learning projects
   – Team taught with 3 faculty: supervised autonomous FPGA projects
8. EEL5706: *Resilient Computer Systems Design* [15]
   – Fault Classification, Redundancy, Failure Rate Analysis, Checkpointing
   – added to graduate course catalog
9. EEL5708: *High Performance Computer Architecture* [40]
   – Pipelining/Branch Prediction, Superscalar Architecture, Cache Design
   – offered in live-only and live-with-remote-video plus web-based formats
10. EEL6361: *Emerging Device Computing Architectures* [15]
    – Logic-In-Memory and non-Boolean computing approaches. System design
    – added to graduate course catalog
11. EEL6707: *Parallel Processing* [20]
    – Distributed/Shared Memory, Interconnection Networks, Data Transformations
    – offered in live-only and live-with-remote-video plus web-based formats

12. EEL6763a: *Current Topics - Scalable Shared-Memory Architectures* [20]
    – Data Consistency, Cache Coherence, Profiling and Metrics
    – offered in live-with-remote-video format
13. EEL6763b: *Current Topics - Clockless Processor Design* [20]
    – Asynchronous ALU Design, Fine-grained and Coarse-grained Dataflow
14. EEL6763c: *Current Topics - Autonomously Reconfigurable and Evolvable Hardware* [20]
    \ECM6308 – FPGA-based Intrinsic/Extrinsic Evolution, Autonomous Regeneration
    – offered in live-with-remote-video plus web-based format
15. EEL6721: *Evolvable Hardware* [15]
    – Evolvable digital and analog computing hardware, autonomous architectures,
    – added to graduate course catalog
16. EEL6769: *Parallel Knowledge Processing* [15]
    – Marker-propagation Architectures, Classifier Systems, Genetic Algorithms
    – added to graduate course catalog

Revised material, supervised, and/or substitute-taught three additional courses:

17. EEL3342: *Digital Logic Design with Laboratory* [60]
    – Boolean Logic, Combinational and Sequential Circuits
18. EEL4781: *Computer Networks* [30]
    – Protocols, Routing Algorithms, OSI Model, Flow Control
19. EEL5762: *Computer Systems Performance Analysis* [20]
    – Stochastic Modeling, Discrete Event Simul., Appl. to Networks/ Multiprocessors

C. Curriculum Enhancement

- University Course Catalog additions:
  - EEE6721: Evolvable Hardware
  - EEL6361: Emerging Device Computing Architectures
  - EEL6769: Parallel Knowledge Processing
  - EEL4882: Systems Software
  - EEL5708: High Performance Computer Architecture
  - EEL5762: Computer System Performance Analysis
  - EEL5706: Resilient Computer System Design
  - EEL6707: Parallel Processing
  - EEL6763/ECM6308: Current Topics in Parallel Processing
  - and also assisted in the development of EEL4817 and EEL4818 (Machine Learning I and II)
- Curriculum development to support Bachelors degree program in Information Technology and degree program tracks in Computer Engineering
- Evaluation and Proficiency Center (EPC)
  - Founding Director at department scale and expanded college scale
  - Obtained $627,266 ($307,840 Phase I and additional $319,426 Phase II) in Technology Fee Grants as PI. Resources include testing center facilities, laptops, tablets, and vlogging stations for tutoring
  - Administered $300,000 IT Performance Fund allocation for College of Engineering and Computer Science Expansion for labor and training

  - Directed 29 faculty, five Ph.D. students, and the manager staff spanning both pedagogical research and delivery aspects for STEM innovation of 30 undergraduate courses

- Digitizing and Remediating STEM Assessments
  - Created and offered 6-week Faculty Development Workshop to 10 Engineering faculty to digitize their assessments during 2016, 2017, and 2018
- Laboratory Development:
  - Obtained over $1M in laboratory infrastructure grants as PI or Co-PI. Resources include network servers, workstations, 8-way shared-memory multiprocessor, scopes, and analyzers
  - Founder and Director: Computer Architecture Lab, and Evaluation and Proficiency Center
  - Co-developed or renovated: Microprocessor Lab, Open Computing Lab, Intelligent Systems Lab, and VLSI Lab
  - Directed integration of National Instrument's Labview PC-based virtual instrumentation breadboard environment into 2 undergraduate laboratories: EEL3342 and EEL4767
  - Mentoring of student assistants for laboratory manual revision and web-based hosting
- Assessment and Accreditation:
  - Accreditation Coordinator for Accreditation Board for Engineering and Technology (ABET) for Computer Engineering program: 2008
  - Initiated the Southern Association of Colleges and Schools (SACS) Outcomes Assessment methods in UCF Computer Engineering program and maintained Evaluation Matrices
  - ABET lab coordinator and course custodian on multiple occasions
- Principal Investigator of NSF-Funded Division of Research on Learning (DRL) project on Future STEM Learning Environments:

  Title: *Synthesis and Design Workshop on Digitally-Mediated Team Learning*
  Amount: $99,999 plus $22,500 additional private and university supplement for a total of $122,499.
  Duration: September 2018 – August 2019
  - Convened researchers, educators, and practitioners to advance transformative pedagogical approaches for technology-enhanced team learning within STEM disciplines
  - Resulted in 1, 3, and 5+ year research and development plans for a unifying roadmap toward design, development, implementation, and evaluation of digitally-mediated teams
- Investigative Team of NSF Combined Research Curriculum Development (CRCD) grant:

  Title: *Machine Learning Advances for Engineering Education*
  Amount: $416,851 plus $165,077 additional university match for a total of $581,928
  Duration: June 2002 – August 2007
  - Co-developed Machine Learning modules that have been taught them to 243 students in 8 undergraduate classes.
  - Modules motivate students to take senior-level course sequence entitled *Machine Learning I* and *II* that have been taught to 34 students.
  - Project has produced approximately 20 undergraduate research projects, three Masters with thesis, 1 Ph.D., 14 conference papers (8 technically-oriented venues and 6 educationally-oriented venues), and 3 journal papers.
- Additional Educational Works and Media Produced:

- *Computer Organization:* roughly 30 hours of annotated/tagged video screencasts/lecture organized into 23 YouTube modules
- *Digitizing and Remediating STEM Assessments:* roughly 20 hours of video lecture organized as 4 modules over 2 offerings– July 2016 – August 2016; May 2017 – June 2017.
- *NSF Workshop Website:* Designed website which is used nationally by STEM educational researchers. Created webpages including response forms system and infographics. August 2018 – June 2019. Site hosted at: https://www.digital-learning-teams.com/
- *Student and GTA Perceptions of Score Clarification:* oversaw production and created script of YouTube video of educational assessment pedagogy, September 2017.
- *Advancing Engineering Learning and Assessment: Experience Reports in an Evaluation and Proficiency Center:* oversaw production and created script of YouTube video of integrated testing (140 seats) and tutoring center (20 seats) delivering 8,000+ enrollments and 1,000+ tutoring sessions annually, since October 2017.

- Future Faculty Laureates (FFL) Program: (2024-present)

  Conceptualized and served as Founding Director of UCF Future Faculty Laureates (FFL) Program. Provides graduate students with opportunities to learn about the hiring process, various faculty activities (including teaching a class), proposal writing, and NSF programs. Up to 4 FLLs are selected each year to receive $6K budget annually for 2 years, much like Faculty Development Fund for eligible expenses. Held and moderated biweekly meetings and created Webcourse offering.

D. Ph.D. Students Completed

Completed 28 doctoral graduates as Dissertation Advisor:

1. Paul Amoruso, *Machine Learning Acceleration of Micro-Credentialing, Knowledge Gap Remediation, and Micro-Recruiting of STEM Assessments: from Learner Data to Hardware*, Computer Engineering, University of Central Florida, May 2026. (Dissertation Chair)
2. Moussam Hossain, Leveraging Signal Transfer Characteristics and Parasitics of Spintronic Circuits for Area and Energy-Optimized Hybrid Digital and Analog Arithmetic, Computer Engineering, University of Central Florida, May 2024. (Dissertation Chair)

   – Graduate became a faculty member at Southern Illinois University at Edwardsville
3. Adrian Tatulian, Leveraging Signal Transfer Characteristics and Parasitics of Spintronic Circuits for Area and Energy-Optimized Hybrid Digital and Analog Arithmetic, Computer Engineering, University of Central Florida, May 2023. (Dissertation Chair)

   – Graduate pursuing career in academia and/or industry
4. Hossein Pourmeidani, *Energy and Area Efficient Machine Learning Architectures using Spin-Based Neurons*, Doctor of Philosophy, Computer Engineering, University of Central Florida, May 2022. (Dissertation Chair)

   – Graduate became Design Engineer at Samsung Semiconductor, Inc.
5. Shadi Sheikhfaal, *Energy-Efficient In-Memory Architectures Leveraging Intrinsic Behaviors of Embedded MRAM Devices*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August 2021. (Dissertation Chair)

   – Graduate pursuing career in academia.

6. Soheil Salehi Mobarakeh, *Energy-Efficient Signal Conversion and In-Memory Computing Using Emerging Spin-Based Devices*, Doctor of Philosophy, Computer Engineering, University of Central Florida, May 2020. (Dissertation Chair)

   – Graduate became NSF-sponsored Post-Doctoral Fellow (10.2% national selection rate) conducting post-doctoral research at UC-Davis.

7. Steven D. Pyle, *Leveraging the Intrinsic Switching Behaviors of Spintronic Devices for Digital and Neuromorphic Circuits*, Doctor of Philosophy, Computer Engineering, University of Central Florida, May 2019. (Dissertation Chair)

   – Graduate started his own consulting company.

8. Arman Roohi, *Normally-Off Computing Design Methodology Using Spintronics: from Devices to Architectures*, Doctor of Philosophy, Computer Engineering, University of Central Florida, May 2019. (Dissertation Chair)

   – Graduate became a faculty member at University of Nebraska at Lincoln.

9. Ramtin Zand, *Heterogeneous Reconfigurable Fabrics for In-Circuit Training and Evaluation of Neuromorphic Architectures*, Doctor of Philosophy, Computer Engineering, University of Central Florida, May 2019. (Dissertation Chair)

   – Graduate became a faculty member at University of South Carolina.

10. Faris S. Alghareb, *Soft-Error Resilience Framework for Reliable and Energy-Efficient CMOS Logic and Spintronic Memory Architectures*, Doctor of Philosophy, Computer Engineering, University of Central Florida, May 2019. (Dissertation Chair)

    – Graduate became a faculty member at Ninevah University.

11. Navid Khoshavi, *Energy-Aware Data Movement in Non-Volatile Memory Hierarchies*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August 2017. (Dissertation Chair)

    – Graduate became a faculty member at Florida Polytechnic University.

12. Yu Bai, *Stochastic-Based Computing with Emerging Spin-Based Device Technologies*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August, 2016. (Dissertation Co-chair)

    – Graduate became a faculty member at California State University at Fullerton.

13. Ahmad Al-Zahrani, *Fast Online Diagnosis and Recovery of Reconfigurable Logic Fabrics using Design Disjunction*, Doctor of Philosophy, Computer Engineering, University of Central Florida, December, 2015. (Dissertation Chair)

    – Graduate became a faculty member at Umm Al Qura University.

14. Rizwan A. Ashraf, *Adaptive Architectural Strategies for Resilient Energy-Aware Computing*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August, 2015. (Dissertation Chair)

    – Graduate joined Oak Ridge National Laboratory.

15. Naveed Imran, *Autonomous Recovery of Reconfigurable Logic Devices Using Priority Escalation Of Slack*, Doctor of Philosophy, Electrical Engineering, University of Central Florida, December, 2013. (Dissertation Chair)

    – Graduate became a Technical Staff member at AMD, Inc.

16. Rashad Oreifej, *A Sustainable Autonomic Architecture for Organically Reconfigurable Computing Systems*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August, 2011. (Dissertation Chair)

    – Graduate is a Senior Technical Staff at Qualcomm, Inc.

17. Rawad Al-Haddad, *An Adaptive Modular Redundancy Technique To Self-Regulate Availability, Area, And Energy Consumption In Mission-Critical Applications*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August, 2011. (Dissertation Chair)

    – Graduate is a Senior Hardware Engineer at Apple, Inc.

18. Juan Carlos Leon-Barth, *Phoneme-Based Video Indexing Using Phonetic Disparity Search,* Doctor of Philosophy, Computer Engineering, University of Central Florida, December, 2010. (Dissertation Chair)

    – Graduate became a Research Scientist at L3 Communications.

19. Kening Zhang, *A Competitive Reconfiguration Approach to Autonomous Fault Handling Using Genetic Algorithms,* Doctor of Philosophy, Computer Engineering, University of Central Florida, August, 2008. (Dissertation Chair)

    – Graduate became a research scientist at Baidu.

20. Carthik A. Sharma, *Sustainable Fault-Handling of Reconfigurable Logic using Throughput-Driven Assessment*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August, 2008. (Dissertation Chair)

    – Graduate is an Instructor at Puppet Labs in Portland, OR.

21. Heng Tan, *A Multi-layer Field Programmable Gate Array Framework Supporting Autonomous Partial Runtime Reconfiguration*, Doctor of Philosophy, Computer Engineering, University of Central Florida, December, 2007. (Dissertation Chair)

    – Graduate became Senior Digital Hardware Engineer/Project Group Leader at xG Technology, Inc. in Fort Lauderdale, FL.

22. Hubert A. Bahr II, *Bandwidth Reduction Techniques for Embedded Simulation Using Concurrent Behavior Models*, Doctor of Philosophy, Computer Engineering, University of Central Florida, December, 2004. (Dissertation Chair)

    – Graduate became an Assistant Professor at TAMU Central Texas, and is now retired.

23. Juan J. Vargas, *Data Transmission Scheduling for Distributed Simulation Using Packet Alloying*, Doctor of Philosophy, Computer Engineering, University of Central Florida, December, 2004. (Dissertation Chair)

    – Graduate is a tenured faculty member at the University of Costa Rica.

24. Adam J. Rocke, *Mitigation of Network Tampering Through Dynamic Dispatch of Mobile Agents*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August, 2004. (Dissertation Chair)

    – Graduate is faculty member at Seminole State College.

25. Scott C. Smith, *Gate and Throughput Optimization of NULL Convention Digital Circuits*, Doctor of Philosophy, Computer Engineering, University of Central Florida, May, 2001. (Dissertation Chair)
    – Graduate is Professor and ECE Department Chair at the North Dakota State University.

26. Yili Tseng, *High Performance Termination Detection Techniques Supporting Multithreaded Execution*, Doctor of Philosophy, Computer Engineering, University of Central Florida, December, 2000. (Dissertation Chair)
    – Graduate is Associate Professor at Rivier College.

27. Yousef Ma, *Localized Adaptive Networks for Hybrid Symbolic and Subsymbolic Processing*, Doctor of Philosophy, Computer Engineering, University of Central Florida, August, 2000. (Dissertation Chair)
    – Graduate formed and operated his own computing consulting company.

28. Bahman S. Motlagh, *A Concurrent-Read Exclusive-Write Architecture for Scalable Shared-Memory Multiprocessing*, Doctor of Philosophy, Computer Engineering, University of Central Florida, May, 1997. (Dissertation Chair)
    – Graduate is Associate Professor at Daytona State College.

E. M.S. Thesis Students Completed

Completed 30 M.S. students as Thesis Chair and Advisor:

1. Paul Amoruso, "Micro-Credentialing with Fuzzy Content Matching: An Educational Data-Mining Approach," Master of Science, Computer Engineering, University of Central Florida, May, 2023.
   – Graduate entered doctoral degree program in Computer Engineering

2. Harshavardhan Reddy Thummala, "Reduced Footprint Probabilistic Inference Networks Using Novel Hybrid SHE-MTJ/CMOS Based Majority Gate," Master of Science, Electrical Engineering, University of Central Florida, December, 2022.
   – Graduate entered engineering firm

3. Meghana Reddy Vangala, *Long Short-Term Memory with Spin-Based Binary and Non-Binary Neurons*, Master of Science, Computer Engineering, University of Central Florida, August, 2020.
   – Graduate became Design Engineer at Micron Technology, Inc.

4. Adrian Tatulian, *MFPA: Mixed-Signal Field Programmable Array for Energy-Aware Compressive Signal Processing*, Master of Science, Computer Engineering, University of Central Florida, May, 2020.
   – Graduate pursued doctoral studies.

5. Soheil Salehi, *Towards Energy-Efficient and Reliable Computing: From Highly-Scaled CMOS Devices to Resistive Memories*, Master of Science, Computer Engineering, University of Central Florida, December, 2016.
   – Graduate pursued doctoral studies.

6. Navid Khoshavi, *Reactive Rejuvenation of CMOS Logic Paths Using Self-Activating Voltage Domains*, Master of Science, Computer Engineering, University of Central Florida, August, 2016.
   – Graduate pursued doctoral studies.

7. Mohan Krishna Gopi Krishna, *Energy-Aware Reconfigurable Logic Devices Using Spin-Based Storage and Carbon Nanotube Switching*, Master of Science, Computer Engineering, University of Central Florida, May, 2016.
   – Graduate accepted full-time industrial employment.

8. Steven D. Pyle, *Self-Scaling Evolution of Analog Computation Circuits with Digital Accuracy Refinement*, Master of Science, Electrical Engineering, University of Central Florida, August, 2015.
   – Graduate pursued doctoral study at UCF.

9. Adnan Aquib Naseer, *Assessing Approximate Arithmetic Designs In The Presence Of Process Variations and Voltage Scaling*, Master of Science, Computer Engineering, University of Central Florida, May, 2015.
   – Graduate hired by Deloitte.

10. Vignesh Thangavel, *Cascaded Digital Refinement for Intrinsic Evolvable Hardware*, Master of Science, Electrical Engineering, University of Central Florida, May, 2015.
    – Graduate hired by Intel.

11. Matthew Parris, *Optimizing Dynamic Logic Realizations For Partial Reconfiguration Of Field Programmable Gate Arrays*, Master of Science, Computer Engineering, University of Central Florida, May, 2009.
    – Graduate became Avionics Design Lead at NASA Kennedy Space Center.

12. Raul Dookhoo, *Automated Construction and Testing of Dialog Scripts*, Master of Science, Computer Science, University of Central Florida, December, 2008.
    – Graduate joined industry at a software consulting company.

13. Guantong Wang, *Mobile Agent File Integrity Analyzer*, Master of Science, Computer Engineering, University of Central Florida, May, 2001.
    – Graduate started and operates his own company.

14. Dong Lin, *Identification of Similar, Conflicting, and Redundant Entries in Distributed Databases*, Master of Science, Computer Engineering, University of Central Florida, May, 2001.
    – Graduate hired by technology start-up company in San Jose, California.

15. Lu Wang, *Automated Generation of XML Schemas using a Transportation Interchange Language*, Master of Science, Computer Engineering, University of Central Florida, May, 2001.
    – Graduate hired by Oracle Corporation in Orlando, Florida.

16. Bharat Kapoor, *Remote Misuse Detection Using Mobile Agents and Relational Database Query Techniques*, Master of Science, Computer Engineering, University of Central Florida, May, 2000.
    – Graduate hired by Motorola Corporation in Minneapolis, Minnesota.

17. Yong Zhu, *Decentralized Control Schemes for Coordinating Distributed Processing Activities of Mobile Software Agents*, Master of Science, Computer Engineering, University of Central Florida, May, 2000.
    – Graduate hired by AT&T in Santa Clara, California.

18. Jie Lu, *Time-Type Mobile Agent Protocols for Distributed Detection of Network Intrusions*, Master of Science, Computer Engineering, University of Central Florida, May, 2000.
    – Graduate hired by Ingenix, Inc in Hartford, Connecticut.

19. Juan Carlos Leon-Barth, *Forced-Miss Data Referencing Methods for Benchmarking Multiprocessor Memory Hierarchies*, Master of Science, Computer Engineering, University of Central Florida, August, 1998.
    – Graduate hired by IBM Corporation.

20. David Hammer, *High Performance Multiprocessing with Read-time Resolution Data Coherent Strategies*, Master of Science, Computer Engineering, University of Central Florida, August, 1996.
    – Graduate hired by General Dynamics in Buffalo, New York.

21. Paul J. Wilder, *N-ary Cube Interconnection using Multiport Memories*, Master of Science, Computer Engineering, University of Central Florida, May, 1996.
    – Graduate became Dean of the College of Science, Engineering, and Mathematics, Vincennes University, Vincennes, IN.

22. Benito Rosada, *Concurrent Read Replicated Multiprocessor Systems*, Master of Science, Computer Engineering, University of Central Florida, December, 1995.
    – Graduate hired as lecturer in Dominican Academy in Brooklyn, New York.

23. He Zhu, *Rate-Adaptive Source Quench Schemes in Congestion Avoidance Techniques – Performance Bound and Simulation Evaluation*, Master of Science, Computer Engineering, University of Central Florida, December, 1995.
    – Graduate hired by technology start-up company in San Jose, California.

24. Shrikanth Sripathi, *High Performance Classifier Systems on SIMD Architectures*, Master of Science, Computer Engineering, University of Central Florida, December, 1995.
    – Graduate hired by Siemens Corporation in St. Paul, Minnesota.

25. Kenneth A. Drake, *Time and Space Efficient Multiprocessor Synchronization and Quiescence Detection*, Master of Science, Computer Engineering, University of Central Florida, May, 1995.
    – Graduate employed at Lockheed Martin Information Systems in Orlando, Florida.

26. Scott E. Crawford, *Cache Coherence Strategies for Multiported Shared-Memory Architectures*, Master of Science, Computer Engineering, University of Central Florida, December, 1994.

– Graduate hired by General Motors in Detroit, Michigan.

27. Hubert A. Bahr II, *Distribution-Adaptive Priority Queue Scheduling Algorithms for Discrete Event Simulation*, Master of Science, Computer Engineering, University of Central Florida, December, 1994.
    – Graduate was employed at STRICOM in Orlando, Florida.

28. Robert A. Cagle, *Content Addressable Memory with Built-in Marker-Passing Functions*, Master of Science, Computer Engineering, University of Central Florida, May, 1994.
    – Graduate hired by Honeywell in Clearwater, Florida.

29. Richard N. Mercer, *Incremental Boolean Logic Techniques for Nanometer-Scale Computing Devices*, Master of Science, Computer Engineering, University of Central Florida, May, 1994.
    – Graduate hired by Oracle Corporation in Orlando, Florida.

30. Niraj Shah, *Rate-Adaptive Source Quench Congestion Avoidance Technique for TCP and UDP Protocols*, Master of Science, Computer Engineering, University of Central Florida, May, 1994.
    – Graduate hired by AT&T in Boston, Massachusetts.

F. Honors Thesis Students Completed

Completed two undergraduate Honors Thesis students who have pursued graduate degrees:

1. Corey K. Milliord, *Voting Schemes to Enhance the Performance of Evolutionary Repair in Reconfigurable Logic Devices*, Honors Thesis, Bachelor of Science, Computer Engineering, University of Central Florida, May, 2005.
    – Student entered graduate program at Columbia University.

2. Kirk Carter, *An AI Performance Benchmark for the n-Cube*-2, Honors Thesis, Bachelor of Science, Computer Engineering, University of Central Florida, Fall, 1993.
    – Student entered graduate program at Georgia Institute of Technology.

G. Undergraduate Research Students Advised

1. David Crumley, ARO Undergraduate Research Assistant, Fall 2020 - Fall 2021, Topic: An Real-Time Object Detection on Resource-Constricted Field Programmable Hardware
2. Kaitlyn Martin, NSF REU advisee, Spring 2020 - Spring 2022. Topic: Cross-layer Adaptive Rate/Resolution Design for Energy-Aware Acquisition of Spectrally Sparse Signals Leveraging Spin-based Devices.
3. Natesha Ramdhani, NSF REU advisee, Spring 2021. Topic: Probabilistic Spin Logic for Low-Energy Boolean and Non-Boolean Computing.
4. Daniel Mulvaney, NSF REU advisee, Fall 2019 - Spring 2021. Topic: Probabilistic Spin Logic for Low-Energy Boolean and Non-Boolean Computing. Co-Authored:

   M. Hossain, S. Salehi, D. Mulvaney, and R. F. DeMara, "Embedded STT-MRAM Energy Analysis for Intermittent Applications using Mean Standby Duration," in *Proceedings of IEEE International Conference on Electronics Circuits and Systems (ICECS-2021)*, Dubai, UAE, Nov. 28, 2021 – Dec. 1, 2021.

5. Paul Wood, NSF REU advisee, Fall 2019 – present. Topic: Cross-layer Adaptive Rate/Resolution Design for Energy-Aware Acquisition of Spectrally Sparse Signals Leveraging Spin-based Devices. Co-Authored:

   P. Wood, H. Pourmeidani, and R. F. DeMara, "Modular Simulation Framework for Process Variation Analysis of MRAM-based Deep Belief Networks," in *Proceedings of IEEE SoutheastCon 2019 (SECon-2019)*, Raleigh, NC, March 11 - 15, 2020 (original conference date prior to COVID-19 restrictions).

6. Gustavo Camero, NSF REU advisee, Summer 2019 – Spring 2020. Topic: Cross-layer Adaptive Rate/Resolution Design for Energy-Aware Acquisition of Spectrally Sparse Signals Leveraging Spin-based Devices. Co-Authored:

   a. G. Camero, S. Salehi, and R. DeMara, "Behavioral Simulation Educational Framework for 2-Terminal MTJ-based Analog to Digital Converter," in *Proceedings of IEEE Integrated STEM Education Conference (ISEC-2020)*, Princeton, NJ, USA, March 28, 2020 (original conference date prior to COVID-19 restrictions).

   b. G. Camero, S. Salehi, and R. DeMara, "A Spin-based Analog to Digital Converter Interactive Simulation Framework," in *Proceedings of IEEE International Conference on Reconfigurable Computing and FPGAs (ReConFig-2019),* poster with abstract, Cancun, Mexico, December 9 – 11, 2019.

7. Adedoyin Adepegba, *Stochastic p-bit Model Analysis in the Presence of Noise*, NSF-funded Transfer-Learning Environment and Academic Research Network (TLEARN) Advisee, Spring 2018 – present. Advised in research leading to Showcase of Undergraduate Research Excellence (SURE) Judges' Choice Award Winner. Advised to IEEE conference publication as first author. Co-authored:

   a. A. Adepegba, R. Zand, and R. F. DeMara, "Noise Sensitivity Analysis of Deep Belief Networks: A Monte Carlo Simulation for Memristive Crossbars," in *Proceedings of 2019 IEEE Southeastern Conference (SECon-2019)*, Huntsville, AL, USA, April 11 – 14, 2019.

   b. M. Eisinger, R. Zand, A. Adepegba, and R. F. DeMara, "Training Optimization of Restricted Boltzmann Machines using a Contrastive Divergence Algorithm," in *Proceedings of 2019 IEEE Southeastern Conference (SECon-2019)*, Huntsville, AL, USA, April 11 – 14, 2019.

8. Justin Sapp, *Leveraging Stochasticity for On-Chip Learning in Binarized Deep Neural Networks*, NSF REU advisee, Summer 2018 – Spring 2019. He was advised to successfully complete an IEEE magazine publication (*IEEE Computer*) as co-author. Also, he presented poster on above title at SRC CAPSL Annual Review. Co-authored:

   S. D. Pyle, J. D. Sapp, and R. F. DeMara, "Leveraging Stochasticity for In-Situ Learning in Binarized Deep Neural Networks," *Computer* (a.k.a. *IEEE Computer Magazine*), Vol. 52, No. 5, pp. 30-39, May 2019.

   - **Front Cover Featured Article of the Issue**
   - **Selected to Special Issue on Cognitive Computing Systems and Applications**

9. Monica Eisinger, *A Spintronic Neuromorphic Reconfigurable Array for In-Circuit Training and Evaluation of Deep Belief Networks*, NSF REU advisee, Summer 2018 – Fall 2018. . She was advised to successfully complete an IEEE regional conference publication as first author (*IEEE Southeastcon*). Also, she presented poster on above title at SRC CAPSL Annual

Review. Obtained employment as an engineer at Lockheed Martin Information Systems. Co-authored:

a. M. Eisinger, R. Zand, A. Adepegba, and R. F. DeMara, "Training Optimization of Restricted Boltzmann Machines using a Contrastive Divergence Algorithm," in *Proceedings of 2019 IEEE Southeastern Conference (SECon-2019)*, Huntsville, AL, USA, April 11 – 14, 2019.

10. Adam Bush, *A Differential Power Analysis-Resilient Cryptographic Circuit using Non-Volatile Spin-Based Devices*, Summer 2018 to Spring 2019. He was advised to complete research leading to University-level Student Undergraduate Research Forum (SURF) poster which he presented on the above title.
11. Michaela Pain, *SHE-Device Analysis*, NSF REU Advisee, Spring 2018. First employment after graduation as an engineer at Intel Corporation.
12. Stephen Williams, *Evolution of Analog Circuits for Low-Energy Computation*, Young Entrepreneur and Scholar (YES) and RAMP advisee, Fall 2014 – Spring 2016. Pursued graduate studies leading to Ph.D. degree.
13. Clayton Barham, *Avatar data collection*, NSF REU co-advised with PI Avelino Gonzalez, 2013 – 2014. Pursued graduate studies leading to Ph.D.
14. Joshua Dixon, *Avatar user interface*, NSF REU co-advised with PI Avelino Gonzalez, 2011 – 2012.
15. Danielle Frantz, *LIFE form Editor*, NSF REU co-advised with PI Avelino Gonzalez, 2009 – 2011.
16. Steven Kobosko, *CxBR-CxG Dialog Management Platform*, NSF REU co-advised with PI Avelino Gonzalez, 2010 – 2012, Pursued graduate studies leading to Ph.D.
17. Brian Lichtman, *Kiosk Test Cases and User Documentation*, NSF REU co-advised with PI Avelino Gonzalez, 2009 – 2010. Pursued graduate studies.
18. Shane Parker, *Tradeoff Evaluation of Four Dialog Management Systems*, NSF REU co-advised with PI Avelino Gonzalez, 2011 – 2012.
19. Jeanne Parker, *Link between the contextual reasoning computing paradigms used and adapted public-domain libraries*, NSF REU co-advised with PI Avelino Gonzalez, 2011 – 2012.
20. Cassondra Puklavage, *LIFE form Website*, NSF REU co-advised with PI Avelino Gonzalez, 2010 – 2011.
21. Lisa Soros, *CxBR Reasoning Model*, NSF REU co-advised with PI Avelino Gonzalez, 2009 – 2011. Pursued graduate studies.
22. Christopher Walls, *Integration of Memory Module*, NSF REU co-advised with PI Avelino Gonzalez, 2012 – 2013.
23. Bryan Wilder, Application Interface to Memory Module, NSF REU co-advised with PI Avelino Gonzalez, 2012 – 2013.
24. Josiah Wong, Avatar Application-Level Evaluation, NSF REU co-advised with PI Avelino Gonzalez, 2012 – 2013.
25. Nour Oreifej, *FPGA Fault Recovery Simulation Environment*, Undergraduate Exchange Research Project, Training completed September, 2005. Graduate employed by Oracle Corporation.

H. Additional Funded Graduate Project Supervision

1. George R. Harris, M.S. Thesis student, Topic: *Self-timed Architecture for Masked Successive Approximation Analog-to-Digital Conversion*. Graduated May, 2006. Funded 20 hours per week Research Assistantship.
2. Michael Haendel, M.S. Thesis student, Topic: *Dynamic Reconfiguration of Field Programmable Gate Arrays under JTAG Control*. Graduated in December, 2005. Funded 10 hours per week Research Assistantship.
3. Anuja Thakkar, Graduate Research Project: *Dynamic Partial Reconfiguration of FPGAs using JTAG APIs*. Graduated in September, 2005. Funded 10 hours per week Research Assistantship.

I. Graduate Students Under Advisement

Currently advising students as Dissertation Chair and/or Master's Thesis Chair:

1. Richard Yarnell, CpE Ph.D. Student, Graduation anticipated in Summer 2025.
2. Paul Amoruso, CpE Ph.D. Student, Graduation anticipated in Fall 2026.
3. Ayush Prindoria, CpE Ph.D. Student, Graduation anticipated in Fall 2027.

V. Research Activities

A. Funded Projects

Career Funding as PI or co-PI: **$14,199,037**

– Federally-Sponsored Projects: $10,189,672 (72%)

– R. F. DeMara's credit share: $6,392,166

1. Y. Bai (CSUF PI) and R. F. DeMara (UCF Co-PI), *Edge-Based Machine Intelligence Architecture for In-Situ Video Processing using Binarized Neural Networks*. ***U.S. Army Research Office***, June 2020 – September 2023, $420,000. DeMara share: $133,691.

2. R. F. DeMara (PI), L. O. Campbell (Co-PI), and F. Hernandez (Co-PI), *Building STEM Capacity through a Culturally-Relevant Ecosystem for Learner Engagement, Outcomes, and Retention,* **National Science Foundation (NSF)**, May 2020 – April 2024. $1,831,191. DeMara share: $1,062,091.

3. N. Rahnavard (PI) and R. F. DeMara (Co-PI), *Cross-layer Adaptive Rate/Resolution Design for Energy-Aware Acquisition of Spectrally Sparse Signals Leveraging Spin-based Devices*, **National Science Foundation (NSF)**, October 2018 – August 2021 incl. 1-year REU Supplement: $457,711. DeMara share: $228,856.

4. R. F. DeMara (PI), L. O. Campbell (Co-PI). R. Hartshorne (Co-PI), S. Spiegel (Colorado Mines Co-PI), J. Beck, (WPI Co-PI), *DCL: Synthesis and Design Workshop: Digitally-Mediated Team Learning*, **National Science Foundation (NSF),** September 2018 – November 2019: $100,000 plus $22,500 additional private and university supplement for a total of $122,499. DeMara share: $61,250.

5. J. Appenzeller (Purdue PI), R. F. DeMara (UCF Co-PI), R. Ramesh (Berkeley Co-PI), C. Kim (UMN Co-PI), *E2CDA: Type I: Probabilistic Spin Logic for Low-Energy Boolean and Non-Boolean Computing*, **National Science Foundation (NSF)**, Energy-Efficient Computing: from Devices to Architectures program, October 2017 – September 2020 incl. 2-years REU Supplement: $2,485,754. DeMara share: $250,833.

6. J. Appenzeller (Purdue PI), S. Datta (Purdue Co-PI), M. Lundstrom (Purdue Co-PI), R. Ramesh (Berkeley Co-PI), R. F. DeMara (UCF Co-PI), C. Kim (UMN Co-PI), J. P. Wang (UMN Co-PI), **Semiconductor Research Corporation (SRC)**, *SRC Center: Probabilistic Spin Logic for Low-Energy Boolean and Non-Boolean Computing*, with R. F. DeMara lead for SRC theme: Architectures and Systems from Probabilistic Spin Circuits to Benchmarking, January 2018 – December 2020: $1,226,877. DeMara share: $104,416.

7. B. Chen, R, Hartshorne, R. F. DeMara, *Incorporating Career-Readiness Learning in Foundational STEM Curricula via Integrative Assessments*, **UCF Quality Enhancement Plan (QEP) Fund**, July 2017 – June 2019: $10,000. DeMara share: $3,333.

8. R. F. DeMara, *Digitized Assessment and Active Learning Course Redesign Initiatives*, **Harris Corporation and UCF Division of Digital Learning,** $44,167. May 2019 – April 2020. DeMara share: $44,167.

9. R. F. DeMara, *Evaluation and Proficiency Center Learning - Phase II*, **UCF Technology Fund**, May 2018 – April 2019, $319,426.

10. R. F. DeMara, *Evaluation & Proficiency Testing Center and Digitally-Enhanced Learning Initiative*, **Harris Corporation and UCF**, May 2018 – April 2019, $85,846.

11. R. F. DeMara, *Evaluation and Proficiency Center*, **UCF Technology Fund**, January 2017 – January 2018, $275,000. College match $32,840. Project Total: $307,840.
12. R. F. DeMara, *College of Engineering and Computer Science Expansion of the Evaluation and Proficiency Center*, **Florida Information Technology Performance Fund**, July 2016 – June 2017, $300,000. Directed ten faculty, five Ph.D. students, and the manager staff spanning both pedagogical research and delivery aspects for STEM innovation of ten undergraduate courses.
13. R. F. DeMara, *Initiatives in STEM Fellow (iSTEM Fellow)*, **iSTEM Initiatives**, August 2016 – June 2016, $20,000.
14. R. F. DeMara, Y. Jin, M. Lin, J. Wang, and J. S. Yuan, *Ubiquitous Computing Showcase*, **Florida Information Technology Performance Fund**, July 2014 – June 2015, $300,000. DeMara share: $60,000.
15. R. F. DeMara, *Trusted IoT using Cross-layer Leveraging of Reconfigurable Device Signatures*, **Florida Cybersecurity Center**, May 2016 – April 2017, $25,000.
16. J. S. Yuan, H. Cho, R. Abdolvand, G. Atia, R. F. DeMara, and X. Gong, *NSF I/UCRC Center for Multi-functional Integrated System Technology (MIST)*, **National Science Foundation (NSF)**, September 2014 – August 2015, $255,000 including match. DeMara share: $5,200.
17. R. F. DeMara, *Aging-Aware Hardware-Trojan Detection at Runtime*, **Florida Cybersecurity Center**, May 2015 – August 2016, $25,000.
18. R. F. DeMara, *Electronic Evaluation and Proficiency Enhancement in ECE Gateway Courses*, **Florida Information Technology Performance Fund**, May 2014 – April 2016, $228,385.
19. R. F. DeMara, Y. Jin, M. Lin, J. Wang, and J. S. Yuan, *Trusted and Bio-inspired Computing Laboratory and Testbed*, **Florida Information Technology Performance Fund**, July 2014 – June 2015, $100,000. DeMara share: $20,000.
20. M. Lin, K. O. Stanley, L. Wei, R. F. DeMara, M. Georgiopoulos, P. F. Wahid, *Hardware-Assisted Large-Scale Neuroevolution for Multiagent Learning*, **U.S. Army Research Office (ARO) Defense University Research Instrumentation Program (DURIP)**, June 2012 – May 2013, $201,500. DeMara share: $14,105.
21. A. J. Gonzalez and R. F. DeMara, *CRPA: Communicating Avatars: Artificial Intelligence + Computer Graphics = Innovative Science*, **National Science Foundation (NSF)**, Oct 2011 – September 2014, $150,000. DeMara share: $75,000.
22. A. J. Gonzalez and R. F. DeMara, *IRES: U.S.-France Research and Education on Contextual Reasoning and its Application to Conversational Agents,* **National Science Foundation (NSF)**, April 2010 – March 2014, $141,129. DeMara share: $70,565.
23. A. J. Gonzalez and R. F. DeMara, *Collaborative Research: Towards Lifelike Computer Interfaces that Learn,* **National Science Foundation (NSF)**, February 2007 – January 2014, $682,843 (includes an NSF Supplement of $44,500 and REU supplements totaling $63,600) plus $43,208 university match for a total of $735,651. DeMara share: $367,825.
24. R. F. DeMara, *Soar-Longevity: A Sustainable Autonomic Architecture for Organically Reconfigurable Computing Systems,* **Defense Advanced Research Projects Agency (DARPA) SBIR Phase I subcontract**, January 2008 – August 2008, $32,851. DeMara share: $32,851.

25. R. F. DeMara, *FPGA Dynamic Reconfiguration Resource Management,* **U. S. Air Force SBIR Phase II subcontract**, August 2006 – July 2008, $198,903 awarded but retained.
26. R. F. DeMara, *Adaptive Device Fault Occlusion through Competitive Runtime Reconfiguration*, **National Aeronautics and Space Administration (NASA)**, October 2004 – September 2007, $356,000 awarded (modified to $300,000) plus $84,337 university match and $58,532 cost share for a total of $525,538 (modified to $469,538). DeMara share: $469,538.
27. M. Georgiopoulos, R. F. DeMara, A. J. Gonzalez, M. Kysilka, M. Mollaghasemi, E. Gelenbe, and A. Wu, *Machine Learning Advances for Engineering Education,* **National Science Foundation (NSF)**, June 2002 – August 2007, $428,851 plus $165,077 university match for a total of $593,928. DeMara share: $83,149.
28. R. F. DeMara, *Distributed Simulation Fidelity Optimization in the Presence of Communication Latency,* U**.S. Army Research, Development, and Engineering Command (RDECOM)**, January 2005 – February 2006, $100,000 plus $5,000 university match and $3,600 cost share for a total of $108,600. DeMara share: $108,600.
29. R. F. DeMara, *Multi-layer Runtime Reconfiguration Architecture supporting FPGA Defragmentation,* **U. S. Air Force SBIR Phase I subcontract**, September 2005 – December 2005, $16,178. DeMara share: $16,178.
30. R. F. DeMara, A. J. Gonzalez, and M. Georgiopoulos, *Bandwidth and Latency Implications of Integrated Training and Tactical Communication Networks*, **U.S. Army Research, Development, and Engineering Command (RDECOM)**, May 2002 – September 2004, $268,491 plus $28,700 university match and $21,600 cost share for a total of $318,591. DeMara share: $254,873.
31. A. J. Gonzalez, M. Georgiopoulos, and R. F. DeMara, *Learning Robotic Behaviors from Observation of Human Performance*, **U.S. Army Simulation Training and Instrumentation Command (STRICOM)**, May 2002 – April 2003, $110,000. DeMara share: $27,500.
32. J. S. Yuan and R. F. DeMara, *Application-Specific IC Design Using Asynchronous Methodologies*, **Theseus Logic, Inc.**, September 1999 – December 2002, $270,000 plus $240,000 state match and $72,000 cost share for a total of $582,000. DeMara share: $291,000.
33. R. F. DeMara, *Active Computer Defense using Autonomous Agents*, **National Security Agency (NSA) subcontract**, August 1999 – December 2002, $147,382 plus $6,500 department match for a total of $153,882. DeMara share: $153,882.
34. A. J. Gonzalez, R. F. DeMara, and M. Georgiopoulos*, Automated Model Development Techniques for Human Behavior Models***, Defense Modeling and Simulation Office (DMSO)**, May 2001 – August 2002, $98,510 plus $9,834 university match for a total of $108,344. DeMara share: $27,086.
35. A. J. Gonzalez, M. Georgiopoulos, and R. F. DeMara, *An Advanced Representational Paradigm for Human Behavior Modeling in Computer Generated Forces*, **U.S. Army STRICOM and Defense Modeling and Simulation Office (DMSO)**, March 2001 – August 2002, $198,889 plus $15,323 university match for a total of $214,212. DeMara share: $53,553.
36. K. Reynolds*,* M. Georgiopoulos, R. F. DeMara, R. Eaglin, A. J. Gonzalez, and C. Watkins, *Florida Department of Law Enforcement Drug Enforcement Distributed Database System*,

State of Florida, April 2000 – April 2001, $250,000 plus $55,400 university cost share for a total of $305,400. DeMara share: $62,500.

37. A. J. Gonzalez, M. Georgiopoulos, and R. F. DeMara, *Context-Based Representation of Intelligent Behavior in Degraded Systems Simulation***, Naval Air Warfare Center Training Systems Division (NAWCTSD)**, March 2000 – September 2000, $49,960. DeMara share: $7,494.
38. A. J. Gonzalez, R. F. DeMara, and M. Georgiopoulos, *Research Collaboration on Human Behavioral Modeling Techniques for Computer Generated Simulation Entities*, **Mitsubishi Research Institute**, August 1999 – August 2000, $29,269. DeMara share: $7,317.
39. R. F. DeMara, M. Georgiopoulos, and A. J. Gonzalez, *Intelligent Data-Mining of Advanced Training Management and Support Systems*, **Lockheed Martin Information Systems**, August 1999 – May 2000, $38,000 in cost share. DeMara share: $34,200.
40. J. S. Yuan, R. F. DeMara, and Z. Qu, *Interdisciplinary Research in Computer Architecture, ASIC, and Microelectronics Testing and Characterization*, **Theseus Logic and UCF Presidential Research Infrastructure Initiative**, January, 2000, $116,000. DeMara share: $38,667.
41. R. F. DeMara and P. McCauley-Bell*, Tethered Agent System for Distributed Intrusion Detection*, **Lockheed Martin Information Systems**, January 1999 – December 1999, $35,000 plus $35,000 state match for a total of $70,000.
42. R. F. DeMara, *Software Mechanism for Efficient Barrier Synchronization*, **UCF Office of Research**, July 1998 – June 1999, $7,485.
43. R. F. DeMara, R. Eaglin, and M. Y. Wu, *Media Hawk Processor System*, New Equipment Grant, **Concurrent Computer Corporation**, Inc., August, 1998, $110,000.
44. A. J. Gonzalez, R. F. DeMara, and M. Georgiopoulos, *Vehicle Model Generation and Optimization for Embedded Simulation*, **Naval Air Warfare Center Training Systems Division (NAWCTSD)**, January 1998 – December 2001, $402,496. DeMara share: $132,823.
45. R. F. DeMara and B. Petrasko, *Concurrency Strategies for High-Level Simulation Architecture*, **Lockheed Martin Information Systems**, January 1996 – April 1996, $10,000. DeMara share: $5,000.
46. R. F. DeMara, *Nighthawk Multiprocessor System*, New Equipment Grant, **Harris Computer Systems / Concurrent Computer Systems Corporation**, Inc., January, 1996, $275,000. DeMara share: $275,000.
47. R. F. DeMara, *Interprocessor Bandwidth Capacities of Hierarchical Multiprocessor Memory Systems*, **Harris Computer Systems / Concurrent Computer Systems Corporation**, Inc., June 1995 – December 1996, $46,473. DeMara share: $46,473.
48. R. F. DeMara and B. Petrasko, *X-terminal Workstations*, New Equipment Grant, **NCR Corporation**, September, 1994, $6,000. DeMara share: $3,000.
49. R. F. DeMara, *Distributed Interactive Simulation of Computer Generated Forces*, **UCF Institute for Simulation and Training**, May 1993 – December 1993, $18,700. DeMara share: $18,700.
50. R. F. DeMara, *Engineering Infrastructure-Engineering Station Development*, **State of Florida**, September, 1994, January, 1993, $13,150 including $5,000 department match. DeMara share: $13,150.

C. Books

1. Perspectives on Digitally-Mediated Team Learning, L.O. Campbell, R. Hartshorne, R. F. DeMara, Eds., *Springer Publishing*, part of *Springer Nature* Switzerland AG., Cham Switzerland, November 2021, 220 pp., Hardcover DOI: 10.1007/978-3-030-77614-5.

C. Conference Proceedings

1. H. Thapliyal, R. F. DeMara, I. Partin-Vaisband, S. Katkoori (Eds.), *Proceedings of the 33nd Great Lakes Symposium on VLSI*, Irvine, CA, U.S.A., June 5 – 7, 2023, ACM Press, ISBN 979-8-4007-0125-2.
2. A. Sasan, I. Savvidis, H. Thapliyal, R. F. DeMara (Eds.), *Proceedings of the 32nd Great Lakes Symposium on VLSI*, Irvine, CA, U.S.A., June 6 – 8, 2022, ACM Press, ISBN 978-1-4503-9322-5.
3. T. Plaks (Ed.), and R. DeMara, M. Gokhale, S. Guccione, C. Patterson, M. Platzner, G. Smit, and M. Wirthlin, (Assoc. Eds.), *Proceedings of the Seventh International Conference on Engineering of Reconfigurable Systems and Algorithms*, Las Vegas, Nevada, U.S.A., June 25 – 28, 2007, CSREA Press, 321 pages, ISBN 1–60132–026–4, 2007.
4. T. Plaks (Ed.), and R. DeMara, M. Gokhale, S. Guccione, C. Patterson, M. Platzner, G. Smit, and M. Wirthlin, (Assoc. Eds.), *Proceedings of the Sixth International Conference on Engineering of Reconfigurable Systems and Algorithms*, Las Vegas, Nevada, U.S.A., June 26 – 29, 2006, CSREA Press, 272 pages, ISBN 1–60132–011–6, 2006.
5. T. Plaks (Ed.), and R. DeMara, M. Gokhale, S. Guccione, M. Platzner, G. Smit, and M. Wirthlin, (Assoc. Eds.), *Proceedings of the Fifth International Conference on Engineering of Reconfigurable Systems and Algorithms*, Las Vegas, Nevada, U.S.A., June 27 – 30, 2005, CSREA Press, 264 pages, ISBN 1–932415–74–2, 2005.

D. Book Chapters

1. P. Chandarana, M. Elbtity, R. F. DeMara, R. Zand, "MRAM-Based FPGAs: A Survey," in Computer Memory and Data Storage, Ed.: A. Seyedi, IntechOpen Press, 2023. pp. 1-16, DOI: 10.5772/intechopen.108212
2. R. Zand, A. Roohi, and R. F. DeMara, "Fundamentals, Modeling, and Application of Magnetic Tunnel Junction," in Nanoscale Devices: Physics, Modeling, and Their Applications, Taylor & Francis Group, 2018, pp. 337-368, B. K. Kaushik, Ed., ISBN-10: 1-138-06034-8, ISBN-13: 978-1-13-806034-0.
3. A. Vega, P. Bose, and A. Buyuktosunoglu, and R. F. DeMara, "Reliable and power-aware architectures: Fundamentals and modeling," in Rugged Embedded Systems: Computing in Harsh Environments, Elsevier Publishing (Chapter 2), 2017, A. Vega, P. Bose, and A. Buyuktosunoglu, Eds., ISBN-10: 0-128-02459-3, ISBN-13: 978-0-12-802459-1.
4. R. F. DeMara, N. Imran, and R. A. Ashraf, "Emerging Resilience Techniques for Embedded Devices," in Rugged Embedded Systems: Computing in Harsh Environments, Elsevier Publishing, (Chapter 4), 2017, A. Vega, P. Bose, and A. Buyuktosunoglu, Eds., ISBN-10: 0-128-02459-3, ISBN-13: 978-0-12-802459-1.
5. J. Castro, J. Secretan, M. Georgiopoulos, R. F. DeMara, G. Anagnostopoulos, and A. Gonzalez, "Pipelining Fuzzy ARTMAP without Match-Tracking," in *Intelligent Engineering*

Systems through Artificial Neural Networks, Vol. 14, ASME Press, 2004, ISBN: 0–791–80228–0, pp. 100 – 106.

6. R. F. DeMara, Contributor, *Comprehensive Dictionary of Electrical Engineering*, P. A. Laplante, Editor-in-chief, IEEE Press, 1999, ISBN: 0–8493–3128–5.
7. S. H. Chung, D. I. Moldovan, and R. F. DeMara, "Massively Parallel Speech Understanding," in *Massively Parallel Artificial Intelligence*, MIT Press, 1993, J. A. Hendler and H. Kitano, Ed., ISBN: 0–262–61102–3, pp. 138 – 167.

E. Journal Articles

1. P. Amoruso, L. O. Campbell, J. A. Mejia, F. E. Hernandez, and R. F. DeMara, *"*AchieveUp: Personalizing Digitized Assessments and Remediation using an Automated Micro-Credentialing Framework for Canvas LMS," *ASEE Computers in Education (COED) Journal 14(4)*, 2025. DOI: 10.18260/B34C-2C-10192
2. M. A. Chowdhury, M. Hossain, C. Mastrangelo, R. F. DeMara, and S. Salehi, "S-Tune: SOT-MTJ manufacturing parameters tuning for securing the next generation of computing," *Frontiers in Electronics*, Vol 5, August, 2024. DOI=10.3389/felec.2024.1409548.

   Selected to Special Issue on "Spintronics Devices for Computing in a Beyond-CMOS era"
3. X. Ma, P. Sun, S. Luo, Q. Peng, R. F. DeMara and Y. Bai, "Binarized l1-Regularization Parameters Enhanced Stripe-Wise Optimization Algorithm for Efficient Neural Network Optimization," *IEEE Journal of Emerging and Selected Topics in Industrial Electronics*, vol. 5, no. 2, pp. 790-799, April 2024, doi: 10.1109/JESTIE.2023.3313050.
4. A. Bosio, R. F. DeMara, D. Fan, and N. Taherinejad, "Emerging In-Memory Computing Architectures and Applications" special issue editorial in *IEEE Transactions on Emerging Topics in Computing*, Vol 12, No. 1, pp. 3-4, Jan -March 2024.
5. B. Chen and R. F. DeMara, "Promoting Community of Inquiry in Synchronous Team Design Activities for Remote Engineering Laboratory Instruction," *IEEE Transactions on Education*, vol. 67, no. 1, pp. 162-170, Feb. 2024, doi: 10.1109/TE.2023.3333703
6. M. Liu, M. Yin, K. Han, R. F. DeMara, B. Yuan, Y. Bai, "Algorithm and hardware co-design co-optimization framework for LSTM accelerator using quantized fully decomposed tensor train," *Internet of Things*, Volume 22, July 2023, ISSN 2542-6605, DOI: 10.1016/j.iot.2023.100680.
7. J. Rujimora, L. O. Campbell, and R. F. DeMara, "Exploring the Student-to-Faculty Ratio and Degree Attainment in Florida" *Journal of Hispanic Higher Education*, pp. 1-8, May 2023, DOI: 10.1177/15381927231172583.
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48. G. Camero, S. Salehi, and R. DeMara, "A Spin-based Analog to Digital Converter Interactive Simulation Framework," in *Proceedings of IEEE International Conference on Reconfigurable Computing and FPGAs (ReConFig-2019),* poster with abstract, Cancun, Mexico, December 9 – 11, 2019.
49. R. F. DeMara and S. Salehi, "Workshop on Virtualized Active Learning in STEM," in *Proceedings of IEEE Conference on Frontiers in Education (FIE-2019)*, Cincinnati, OH, USA, October 16 – 19, 2019.
50. S. Salehi and R. F. DeMara, "Virtualized Active Learning for Undergraduate Engineering Disciplines (VALUED): A Pilot in a Large Enrollment Classroom," in *Proceedings of IEEE Conference on Frontiers in Education (FIE-2019)*, Cincinnati, OH, USA, October 16 – 19, 2019.
51. R. F. DeMara, L. O. Campbell, R. Hartshorne, and S. Spiegel, "Workshop on Digitally-Mediated Team Learning: Advancing Collaborative Problem-Solving within the STEM Classroom," *NSF Conference on Cyberlearning (CL-2019)*, Alexandria, VA, USA, October 3 – 4, 2019.
52. V. R. Ostwal, R. Zand, R. F. DeMara, and J. Appenzeller, "Binary Stochastic Neuron and Compound Synapse using Spin-orbit Torque Devices," *TECHCON 2019*, Austin, TX, USA, September 8 – 10, 2019.
53. S. Sheikhfaal, S. D. Pyle, S. Salehi, and R. F. DeMara, "An Ultra-Low Power Spintronic Stochastic Spiking Neuron with Self-Adaptive Discrete Sampling," in *Proceedings of IEEE Midwest Symposium on Circuits and Systems (MWSCAS-2019)*, Dallas, TX, USA, Aug. 4 – 7, 2019.
54. R. F. DeMara, L. O. Campbell, R. Hartshorne, S. Spiegel, and J. G. Katz, "Community Report on Digitally-Mediated Team Learning," National Science Foundation (NSF) Center for Innovative Research in Cyberlearning (CIRCL) Rapid Community Report, August 1, 2019. Available at: https://circlcenter.org/wp-content/uploads/2019/08/DeMara-DMTL-Whitepaper.pdf
55. A. Roohi and R. F. DeMara, "IRC: Cross-layer design exploration of Intermittent Robust Computation for IoT Datapaths," in *Proceedings of IEEE Computer Society Annual Symposium on VLSI (ISVLSI-2019)*, Miami, FL, U.S.A., July 15 – 17, 2019.
56. S. Salehi, A. Zaeemzadeh, A. Tatulian, N. Rahnavard, and R. F. DeMara, "MRAM-based Stochastic Oscillators for Adaptive Non-Uniform Sampling of Sparse Signals in IoT Applications," in *Proceedings of IEEE Computer Society Annual Symposium on VLSI (ISVLSI-2019)*, Miami, FL, U.S.A., July 15 – 17, 2019.
57. S. Salehi, R. Zand, and R. F. DeMara "Learner Capstone Panels for Immersing Undergraduates in Mechanisms of Engineering Research," in *Proceedings of American Society for Engineering Education Annual Conference (ASEE-2019)*, Tampa, FL, USA, June 16 – 19, 2019.
58. R. F. DeMara, T. Tian, S. Sheikhfaal, and W. Howard, "Adapting Mixed-Mode Instructional Delivery to Thrive within STEM Curricula," in *Proceedings of American Society for Engineering Education Annual Conference (ASEE-2019)*, Tampa, FL, USA, June 16 – 19, 2019.

59. R. F. DeMara, J. E. Beck, L. O. Campbell, R. Hartshorne, S. Spiegel, Z. Chen, M. Dagley, E. Hernandez, T. Tian, T. Gibson, S. Sheikhfaal, A. Tatulian, H. Pourmeidani, and H. Esteves, "Methods and Outcomes of the NSF Project on Synthesizing Environments for Digitally-Mediated Team Learning," in *Proceedings of American Society for Engineering Education Annual Conference (ASEE-2019)*, Tampa, FL, USA, June 16 – 19, 2019.
60. S. Sheikhfaal and R. F. DeMara, "Leveraging Emerging Device Stochasticity, Non-Volatility, and Area Utilization in Neuromorphic Computation," *ACM Design Automation Conference (DAC-2019) Richard Newton Poster Presentation*, Las Vegas, NV, June 2 – 6, 2019.
61. S. Salehi and R. F. DeMara, "Energy-Aware Adaptive Non-Uniform Sampling of Sparse Signals Leveraging MRAM-based Devices for IoT Applications," *ACM Design Automation Conference (DAC-2019) Ph.D. Forum Student/Adviser Poster Presentation*, Las Vegas, NV, June 2 – 6, 2019.
62. S. Salehi, R. Zand, A. Zaeemzadeh, N. Rahnavard, and R. F. DeMara, "AQuRate: MRAM-based Stochastic Oscillator for Adaptive Quantization Rate Sampling of Spectrally Sparse Signals," in *Proceedings of 29th ACM Great Lakes Symposium on VLSI (GLSVLSI-2019)*, Washington DC, USA, May 9 – 11, 2019.

    Best Poster Award of the conference.

63. F. Alghareb and R. F. DeMara, "Design and Evaluation of DNU-Tolerant Registers for Resilient Architectural State Storage" in *Proceedings of 28th ACM Great Lakes Symposium on VLSI (GLSVLSI-2019)*, Washington DC, USA, May 9 – 11, 2019.
64. S. Salehi, R. Zand, and R. F. DeMara, "Clockless Spin-based Look-Up Tables with Wide Read Margin," in *Proceedings of 28th ACM Great Lakes Symposium on VLSI (GLSVLSI-2019)*, Washington DC, USA, May 9 – 11, 2019.
65. A. Adepegba, R. Zand, and R. F. DeMara, "Noise Sensitivity Analysis of Deep Belief Networks: A Monte Carlo Simulation for Memristive Crossbars," in *Proceedings of 2019 IEEE Southeastern Conference (SECon-2019)*, Huntsville, AL, USA, April 11 – 14, 2019.
66. M. Eisinger, R. Zand, A. Adepegba, and R. F. DeMara, "Training Optimization of Restricted Boltzmann Machines using a Contrastive Divergence Algorithm," in *Proceedings of 2019 IEEE Southeastern Conference (SECon-2019)*, Huntsville, AL, USA, April 11 – 14, 2019.
67. R. F. DeMara, T. Tian S. Salehi, N. Khoshavi, and S. D. Pyle, "Scalable Delivery and Remediation of Engineering Assessments using Computer-Based Testing," in *Proceedings of IEEE Integrated STEM Education Conference (ISEC-2019)*, Princeton, NJ, USA, March 16, 2019.
68. M. Nader, R. F. DeMara, A. Tatulian, and B. Chen, "Quantitative Impact on Learning Achievement of High Integrity Testing during Online Delivery," in *Proceedings of American Society for Engineering Education Southeastern Conference (ASEE-SE-19)*, Raleigh, NC, U.S.A., March 10 – 12, 2019.
69. A. Roohi, S. Angizi, D. Fan, and R. F. DeMara, "SOT-MRAM Processing-In-Memory Acceleration of Convolutional Neural Networks for Energy-Efficiency, Throughput, and Power-Intermittency Resilience," in *Proceedings of the 20th IEEE International Symposium on Quality Electronic Design (ISQED-2019)*, Santa Clara, CA, March 6 – 7, 2019.
70. R. Zand and R. F. DeMara, "HSC-FPGA: A Hybrid Spin/Charge FPGA Leveraging the Cooperating Strengths of CMOS and MTJ Devices," in *Proceedings of 27th ACM/SIGDA*

International Symposium on Field-Programmable Gate Arrays, Seaside, CA, USA, February 24 – 26, 2019.

71. R. F. DeMara, B. Chen, and R. Hartshorne, "Elevating Participation and Outcomes with Digitized Assessments In Large-Enrollment Foundational STEM Curricula: An Immersive Development Workshop for STEM Faculty," *Online Learning Consortium Accelerating Learning Conference (OLC-2018)*, Orlando, FL, USA, November 14 - 17, 2018.
72. R. Zand and R. F. DeMara, "SNRA: A Spintronic Neuromorphic Reconfigurable Array for In-Circuit Training and Evaluation of Deep Belief Networks," in *Proceedings of IEEE International Conference on Rebooting Computing (ICRC-2018)*, Washington, DC, USA, November 7 – 9, 2018, pp. 1 – 8.
73. S. Salehi and R. F. DeMara, "BGIM: Bit-Grained Instant-on Memory Cell for Sleep Power Critical Mobile Applications," in *Proceedings of IEEE International Conference on Computer Design (ICCD-2018)*, Orlando, FL, USA, October 7 - 10, 2018.
74. T. Tian, R. F. DeMara, and S. Gao, "Lockdown Computerized Testing Interwoven with Rapid Remediation: A Crossover Study within a Mechanical Engineering Core Course," in *Proceedings of IEEE Conference on Frontiers in Education (FIE-18)*, San Jose, CA, USA, October 3 – 6, 2018.
75. R. F. DeMara, D. Turgut, E. Nassiff, S. Bacanli, N. H. Bidoki, and J. Xu, "Automated Formation of Peer Learning Cohorts using Computer-Based Assessment Data: A Double-Blind Study within a Software Engineering Course," in *Proceedings of American Society for Engineering Education Annual Conference (ASEE-18)*, Salt Lake City, UT, USA, June 24 – 27, 2018.
76. T. Tian and R. F. DeMara, "High-Fidelity Digitized Assessment of Heat Transfer Fundamentals using a Tiered Delivery Strategy," in *Proceedings of American Society for Engineering Education Annual Conference (ASEE-18)*, Salt Lake City, UT, USA, June 24 – 27, 2018.
77. A. Roohi and R. F. DeMara, "Intermittent Computation for Energy-Harvesting-Powered Devices Using Selectively Non-Volatile Datapaths," *ACM//IEEE 55th Design Automation Conference (DAC) Work-in-Progress Poster presentation*, San Francisco, CA USA, June 24 – 28, 2018.
78. R. Zand, K. Y. Camsari, S. D. Pyle, I. Ahmed, C. H. Kim, and R. F. DeMara, "Low-Energy Deep Belief Networks using Intrinsic Sigmoidal Spintronic-based Probabilistic Neurons," in *Proceedings of 28th ACM Great Lakes Symposium on VLSI (GLSVLSI-2018)*, Chicago, IL, USA, May 23 – 25, 2018. Acceptance rate 26%.

    Best Paper recognition and cash prize.

79. A. Roohi, R. Zand, and R. F. DeMara, "Logic-Encrypted Synthesis for Energy-Harvesting-Powered Spintronic-Embedded Datapath Design," in *Proceedings of 27th ACM Great Lakes Symposium on VLSI (GLSVLSI-2018)*, Chicago, IL, USA, May 23 – 25, 2018. Acceptance rate 26%.
80. S. Angizi, Z. He, Y. Bai, J. Han, M. Lin, R. F. DeMara, and D. Fan, "Leveraging Spintronic Devices for Efficient Approximate Logic and Stochastic Neural Networks," in *Proceedings of 27th ACM Great Lakes Symposium on VLSI (GLSVLSI-2018)*, Chicago, IL, USA, May 23 – 25, 2018.

81. F. Alghareb, R. Zand, and R. F. DeMara, "High-Performance Double Node Upset-Tolerant Non-Volatile Flip-Flop Design," in *Proceedings of IEEE SoutheastCon 2018 (SECon-2018)*, St. Petersburg, FL, USA, April 19 – 22, 2018.

82. S. D. Pyle and R. F. DeMara, "An Analysis of Voltage-Driven Spintronic Device Concatenation Through Spin Pumping," poster with abstract at *IEEE SoutheastCon 2018 (SECon-2018)*, St. Petersburg, FL, USA, April 19 – 22, 2018.

83. R. F. DeMara and R. A. Ashraf, "Self-Organizing Middleware for Extreme Heterogeneity: The Role of Technology-Oblivious Machine Learning Approaches to Realize Autonomous Resource Adaptation," position paper to *DOE Extreme Heterogeneity Workshop (WEH-18)*, Gaithersburg, MD, January 23 – 25, 2018.

84. R. F. DeMara, "Heterogeneous Technology Configurable Fabrics: A Field-Programmable Paradigm for Leveraging Post-CMOS Devices in HPC," position paper to *DOE Extreme Heterogeneity Workshop (WEH-18)*, Gaithersburg, MD, January 23 – 25, 2018.

85. A. Roohi, R. Zand, and R. F. DeMara, "Synthesis of Normally-Off Boolean Circuits: An Evolutionary Optimization Approach Utilizing Spintronic Devices," in *Proceedings of the 19th IEEE International Symposium on Quality Electronic Design (ISQED)*, Santa Clara, CA, March 13 – 14, 2018.

86. B. Chen, R. F. DeMara, and R. Hartshorne, "Developing Computer-based Assessments for Large-Enrollment Classes: A Faculty Workshop for STEM Disciplines," poster with abstract at *American Educational Research Association Annual Meeting (AERA-2018)*, April 13 – 17, 2018, New York, NY, USA.

87. T. Tian and R. F. DeMara, "Matrix-Organized Instructional Delivery for Scaling-up Problem-based Learning through Reallocation of Instructional Support," in *Proceedings of American Society for Engineering Education Southeastern Conference (ASEE-SE-18)*, Daytona Beach, FL, March 4 – 6, 2018.

88. R. F. DeMara, A. Roohi, R. Zand, and S. D. Pyle, "Heterogeneous Technology Configurable Fabrics for Field Programmable Co-design of CMOS and Spin-based Devices," in *Proceedings of IEEE International Conference on Rebooting Computing (ICRC-2017)*, Washington, DC, USA, November 8 – 9, 2017, pp. 1 – 4. DOI: 10.1109/ICRC.2017.8123638

89. A. Roohi, R, F. DeMara, L. Wang, and S. Köse, "Secure Intermittent-Robust Computation for Energy Harvesting Device Security and Outage Resilience," in *Proceedings of 14th IEEE International Conference on Advanced and Trusted Computing (IEEE ATC-2017)*, San Francisco, CA, USA, August 4 – 8, 2017.

90. R. A. Ashraf, R. Gioiosa, G. Kestor, and R. F. DeMara, "Exploring the Effect of Compiler Optimizations on the Reliability of HPC Applications," in *Proceedings of 22nd IEEE Workshop on Dependable Parallel, Distributed and Network-Centric Systems (IEEE DPDNS 2017)*, Orlando, FL, USA, June 2, 2017.

91. F. Alghareb, R. A. Ashraf, A. Al-Zahrani, and R. F. DeMara, "Energy and Delay Tradeoffs of Soft Error Masking for 16nm FinFET Logic Paths: Survey and Impact of Process Variation in Near Threshold Region," *IEEE International Symposium on Circuits & Systems (ISCAS-2017),* lecture presentation, Baltimore, MD, USA, May 28 – 31, 2017.

    Program Committee Selection as an *IEEE Transactions on Circuits and Systems* highlighted article of 2017 for Lecture Presentation at ISCAS.

92. S. Salehi and R. F. DeMara, "Process Variation Immune and Energy Aware Sense Amplifiers for Resistive Non-Volatile Memories," in *Proceedings of IEEE International Symposium on Circuits & Systems (ISCAS-2017)*, Baltimore, MD, USA, May 28 – 31, 2017.

93. Y. Bai, S. Hu, R. F. DeMara, and M. Lin, "A Spin-Orbit Torque based Cellular Neural Network (CNN) Architecture," in *Proceedings of 27th ACM Great Lakes Symposium on VLSI (GLSVLSI-2017)*, Banff, Alberta, Canada, May 10 – 12, 2017.

94. R. F. DeMara, "Heterogeneous Technology Configurable Fabrics: Leveraging Reconfiguration as a Pathway Towards Emerging Devices," Conference Keynote Address *in Proceedings of IEEE Reconfigurable Architectures Workshop (RAW-2017)*, pp. 88-89, Lake Buena Vista, FL, USA, May 29, 2017. DOI: 10.1109/IPDPSW.2017.191

    Keynote Speech of the conference with an IEEExplore-indexed paper abstract.

95. R. F. DeMara, R. Hartshorne, B. Chen, and R. Zand, "Digitizing and Remediating Engineering Assessments: An Immersive and Transportable Faculty Development Workshop," in *Proceedings of American Society for Engineering Education Annual Conference (ASEE-17)*, Columbus, OH, USA, June 25 – 28, 2017.

96. R. F. DeMara, S. Salehi, R. Hartshorne, and B. Chen, "GLASS: Group Learning At Significant Scale via WiFi-Enabled Learner Design Teams in an ECE Flipped Classroom," in *Proceedings of American Society for Engineering Education Annual Conference (ASEE-17)*, Columbus, OH, USA, June 25 – 28, 2017.

97. R. Thripp, R. F. DeMara, R. Hartshorne, and B. Chen, "Fortifying Asynchronous Online Learning with Digitally Delivered In-Person Assessments to Leverage the Testing Effect within Undergraduate Engineering Courses," (poster presentation), *International Conference on e-Learning (ICEL)*, Orlando, FL, USA, June 1 – 2, 2017.

98. N. Khoshavi, S. Salehi, and R. F. DeMara, "Variation-Immune Resistive Non-Volatile Memory using Self-Organized Sub-Bank Circuit Designs," in *Proceedings of 18th International Symposium on Quality Electronic Design (ISQED-2017)*, Santa Clara, CA, USA, March 13 – 15, 2017.

    Conference Best Paper Candidate / A Best Paper of Track.

99. S. Angizi, Z. He, R. F. DeMara, D. Fan, "Composite Spintronic Accuracy-Configurable Adder for Low Power Digital Signal Processing," in *Proceedings of 18th International Symposium on Quality Electronic Design (ISQED-2017)*, Santa Clara, CA, USA, March 13 – 15, 2017.

100. R. Hartshorne, R. F. DeMara, and B. Chen, "Strategies and Lessons Learned from a Faculty Development Pilot Program for Computerizing Assessments in Engineering Curricula," abstract and presentation at *27th Annual Conference of the Society for Information Technology and Teacher Education (SITE-2017)*, Austin, TX, USA, March 5 – 9, 2017.

101. S. Kose, L. Fei, and R. F. DeMara, "On-Chip Sensor Circle Distribution Technique for Real-Time Hardware Trojan Detection," poster-only presentation at *Government Microcircuit Applications & Critical Technology Conference* (GOMACTech-2016), Reno, NV, USA, March 20 – 23, 2017.

102. R. Gioiosa, R. A. Ashraf, G. Kestor, R. F. DeMara, C.-Y. Cher, and P. Bose, "Modeling Fault Propagation in HPC Applications," *Workshop on Modeling & Simulation of Systems and Applications (ModSim-2016)* (presentation with abstract), Seattle, WA, USA, August 10 – 12, 2016.

103. R. F. DeMara and M. Lin, "Heterogeneous Technology Fabric," *2016 Command, Control, Communications, Computers, Intelligence (C4I) and Cyber Conference* (poster presentation only), Utica, NY, U.S.A., June 14 – 16, 2016.

104. F. Alghareb, M. Lin, and R. F. DeMara, "Soft Error Effect Tolerant Temporal Self-Voting Logic with Low Area and Energy Overheads," in *Proceedings of IEEE Computer Society Annual Symposium on VLSI (ISVLSI-2016)*, Pittsburgh, Pennsylvania, U.S.A., July 11-13, 2016.

105. R. F. DeMara, N. Khoshavi, S. Pyle, J. Edison, R. Hartshorne, B. Chen, M. Georgiopoulos, "Redesigning Computer Engineering Gateway Courses using a novel Remediation Hierarchy," in *Proceedings of American Society for Engineering Education National Conference (ASEE-16)*, New Orleans, LA, USA, June 26 – 29, 2016.

106. X. Chen, N. Khoshavi, J. Zhou, D. Huang, R. F. DeMara, J. Wang, W. Wen, and Y. Chen, "AOS: Adaptive Overwrite Scheme for Reduced-Latency Energy-Efficient MLC STT-RAM Cache," in *Proceedings of 53rd Design Automation Conference (DAC-2016)*, Austin, TX, USA, June 5 – 9, 2016.

107. R. A. Ashraf, N. Khoshavi, A. Alzahrani, R. F. DeMara, S. Kiamehr and M. B. Tahoori, "Area-Energy Tradeoffs of Logic Wear-Leveling for BTI-induced Aging," in *Proceedings of ACM Computing Frontiers*, May 16 – 18, 2016, Como, Italy. Acceptance rate 27%.

108. R. Hartshorne, B. Chen, J. Edison, and R. F. DeMara, "Flipping the Computer Engineering Gateway Courses: A Discussion of the Processes and Results," in *Proceedings of Society for Information Technology & Teacher Education International Conference*, pp. 686 – 689, March 21 – 25, 2016, Savannah, Georgia, USA.

109. X. Chen, N. Khoshavi, R. F. DeMara, J. Wang, W. Wen, and Y. Chen, "A Selective Overwrite Scheme to Mitigate Write Disturbance for Energy Efficient MLC STT-RAM," *2016 Non-Volatile Memories Workshop (NVMW-2016)*, March 6 – 8, 2016. Presentation only; no proceedings.

110. N. Khoshavi, X. Chen, J. Wang, and R. F. DeMara, "Bit-Upset Vulnerability Factor for eDRAM," in *Proceedings of 17th International Symposium on Quality Electronic Design (ISQED 2016)*, Santa Clara, CA, USA, March 15 – 16, 2016. Acceptance rate 36.3%.

111. C. Labrado, H. Thapliyal, and R. F. DeMara, "Design of Testable Adder Circuits for Spintronics Based Nanomagnetic Computing," in *Proceedings of International Symposium on Nanoelectronic and Information Systems* (*INIS-2015)*, pp. 117 – 111, Indore, India, December 21 – 23, 2015.

112. R. F. DeMara, S. Salehi, N. Khoshavi, R. Hartshorne, and B. Chen, "Strengthening STEM Laboratory Assessment Using Student-Narrative Portfolios Interwoven with Online Evaluation," in *Proceedings of American Society for Engineering Education Southeastern Conference (ASEE-SE-16),* pp. 1 – 15, Tuscaloosa, AL, USA, March 13 – 15, 2016.

113. R. F. DeMara, S. Salehi, and S. Muttineni, "Exam Preparation through Directed Video Blogging using Electronically-Mediated Realtime Classroom Interaction," in *Proceedings of American Society for Engineering Education Southeastern Conference (ASEE-SE-16)*, pp. 1 – 11, Tuscaloosa, AL, USA, March 13 – 15, 2016.

Selected for a multimedia synopsis in the Teaching Online Pedagogical Repository titled "Using Learner Created Videos for Student Engagement in a Flipped Classroom."

114. R. F. DeMara and C. A. Sharma, and R. A. Ashraf, "Secure Reconfigurable Logic Fabrics through Online Resource Sensing and Competition," *Florida Cybersecurity Symposium,* (presentation with abstract), Tampa, FL, USA, October 13 – 14, 2015.

115. A. M. Chabi, A. Roohi, H. Khademolhosseini, S. Angizi, R. F. DeMara, and K. Navi, "Cost-Efficient QCA Reversible Combinational Circuits Based on a New Reversible Gate," in *IEEE Proceedings of International Symposium on Computer Architecture and Digital Systems (CADS-2015)*, pp. 1 – 6, Tehran, Iran, October 7 – 8, 2015.

116. R. A. Ashraf, R. Gioiosa, G. Kester, C. Cher, P. Bose, and R. F. DeMara, "Understanding the Propagation of Transient Errors in HPC Applications," in *Proceedings of The International Conference for High Performance Computing, Networking, Storage and Analysis (Super Computing-2015)*, Article 72, pp. 1 – 12, Austin, TX, USA, November 15 – 20, 2015. Conference acceptance rate 22%; Track acceptance rate 14.4%.

117. A. Al-Zahrani and R. F. DeMara, "Hypergraph-Cover Diversity for Maximally-Resilient Reconfigurable Systems," in *Proceedings of 12th IEEE International Conference on Embedded Software and Systems (ICESS-2015)*, pp. 1086 – 1092, New York, NY, USA, August 24 – 26, 2015. Acceptance rate 20.5%.

118. A. Al-Zahrani and R. F. DeMara, "Process Variation Immunity of Alternative 16nm HK/MG-based FPGA Logic Blocks," in *Proceedings of IEEE 58th International Midwest Symposium on Circuits and Systems (MWSCAS-2015)*, pp. 1 – 4, Fort Collins, CO, USA, August 2 – 5, 2015.

119. S. D. Pyle, V. Thangavel, S. M. Williams, and R. F. DeMara, "Self-Scaling Evolution of Analog Computation Circuits with Digital Accuracy Refinement," in *IEEE Proceedings of NASA/ESA Conference on Adaptive Hardware and Systems (AHS 2015)*, pp. 1 – 8, Montreal, QC, Canada, June 15 – 18, 2015.

Best Paper Award of Conference – Citation: *"Best Design Paper."*

120. A. Roohi, R. F. DeMara, and N. Khoshavi, "Dual Computational Layer Based Logic Design for QCA Circuits" in *Proceedings of ACM /IEEE* 51st *Design Automation Conference (DAC-2015) Work-In-Progress poster presentation,* San Francisco, CA, USA, June 3 – 6, 2015.

121. R. A. Ashraf, A. Al-Zahrani, N. Khoshavi, R. Zand, S. Salehi, A. Roohi, M. Lin, R. F. DeMara, "Reactive Rejuvenation of CMOS Logic Paths using Self-Activating Voltage Domains," in *Proceedings of IEEE International Symposium on Circuits and Systems (ISCAS)*, pp. 2944 – 2947, Lisbon, Portugal, May 24-27, 2015.

122. R. Al-Haddad, R. S. Oreifej, R. Zand, A. Ejnioui, and R. F. DeMara "Adaptive Mitigation of Radiation-Induced Errors and TDDB in Reconfigurable Logic Fabrics," in *Proceedings of North American Test Workshop (NATW 2015)*, pp. 23 – 32, Johnson City, NY, USA, May 11 – 13, 2015.

123. A. A. Naseer, R. A. Ashraf, D. Dechev, and R. F. DeMara. "Designing Energy-Efficient Approximate Adders using Parallel Genetic Algorithms," in *Proceedings of IEEE SoutheastCon 2015 (SECon-2015)*, pp. 1 – 7, Fort Lauderdale, FL, April 9 – 12, 2015.

124. S. Salehi and R. F. DeMara, "Energy and Area Analysis of a Floating-Point Unit in 15nm CMOS Process Technology," in *Proceedings of IEEE SoutheastCon 2015 (SECon-2015)*, pp. 1 – 5, Fort Lauderdale, FL, USA, April 9 – 12, 2015.

125. K. Zhang, N. Khoshavi, J. M. Alghazo, and Ronald F. DeMara, "Organic Embedded Architecture for Sustainable FPGA Soft-Core Processors," in *Proceedings of IEEE 61st Reliability and Maintainability Symposium (RAMS-2015)*, pp. 1 – 6, Palm Harbor, FL, USA, January 26 – 29, 2015.

126. R. Oreifej, R. Al-Haddad, R. A. Ashraf, and R. F. DeMara, "Sustainability Assurance Modeling for SRAM-based FPGA Evolutionary Self-Repair," in *Proceedings of IEEE International Conference on Evolvable Systems (ICES-2014)*, pp. 17 – 22, Orlando, FL, USA, December 9 – 12, 2014.

127. N. Khoshavi, R. A. Ashraf, and R. F. DeMara, "Applicability of Power-Gating Strategies for Aging Mitigation of CMOS Logic Paths," in *Proceedings of IEEE 57th International Midwest Symposium on Circuits and Systems (MWSCAS-2014)*, pp. 929 – 932, College Station, TX, USA, August 3 – 6, 2014.

128. R. A. Ashraf, A. Alzahrani, and R. F. DeMara, "Extending Modular Redundancy to NTV: Costs and Limits of Resiliency at Reduced Supply Voltage," in *Proceedings of Workshop on Near Threshold Computing (WNTC-2014)* Minneapolis, MN, USA, June 14, 2014.

129. R. A. Ashraf, A. Alzahrani, and R. F. DeMara, "Exploring Spatial Redundancy to Mitigate Aging-Induced Timing Degradation," *ACM/EDAC/IEEE* 51st *Design Automation Conference (DAC) Work-in-Progress Poster presentation*, San Francisco, California, USA, June 1 – 5, 2014.

130. N. Imran, R. Ashraf, and R. F. DeMara, "Evaluating Quality and Resilience of an Embedded Video Encoder against a Continuum of Energy Consumption," invited submission to *2014 Workshop on Suite of Embedded Applications and Kernels (SEAK-2014)*, San Francisco, California, USA, June 1, 2014.

131. M. Alawad, Y. Bai, R. F. DeMara, and M. Lin, "Energy-Efficient Multiplier-Less Discrete Convolver through Probabilistic Domain Transformation," in *Proceedings of 22nd ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA-14)*, pp. 185-188, Monterey, California, USA, February 27-28, 2014. DOI=10.1145/2554688.2554769 http://doi.acm.org/10.1145/2554688.2554769

132. A. Alzahrani and R. F. DeMara, "Non-Adaptive Sparse Recovery and Fault Evasion using Disjunct Design Configurations," abstract in *Proceedings of 22nd ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA-14)*, pp 251-251, Monterey, California, USA, February 27 – 28, 2014.

133. R. Ashraf and R. F. DeMara, "Scalability of Modular Redundancy for Near-Threshold Computing," *Workshop on Highly-Reliable Power-Efficient Embedded Designs (HARSH 2014)*, Orlando, Florida, USA, February 16th, 2014.

134. J. Hollister, S. T. Parker, A. J. Gonzalez, and R. F. DeMara, "An Extended Turing Test: A Context Based Approach Designed to Educate Youth in Computing" in *Proceedings of 8th International and Interdisciplinary Conference of Modeling and Using Context (CONTEXT-2013)*, Annecy, France, October 28 – 31, 2013. Reprinted in P. Brézillon, P. Blackburn, and R. Dapoigny, editors, Modeling and Using Context, Springer Berlin Heidelberg Lecture Notes in Computer Science, ISBN: 978-3-642-40971-4, pp. 213 – 221.

135. N. Imran, R. Ashraf, and R. F. DeMara, "On-demand Fault Scrubbing Using Adaptive Modular Redundancy," in *Proceedings of the International Conference on Engineering of*

Reconfigurable Systems and Algorithms (ERSA 2013), Las Vegas, Nevada, USA, July 22 – 25, 2013.

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G. Patents, Invention Disclosures, and Licenses

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3. R. F. DeMara and A. Roohi, "A Parity-Preserving Reversible QCA Gate with Cascadable Resilience," Invention Disclosure, UCF Office of Research and Commercialization, April 15, 2015.
4. R. F. DeMara and H. Tan, "Multi-layer Runtime Reconfiguration Architecture for FPGA Resource Management," FPGA circuit environment licensed by University of Central Florida Research Foundation to Space Photonics, Inc., Fayetteville, Arkansas, U.S.A, on September 2, 2005.
5. R. F. DeMara, "Discrepancy Mirror for Self-Checking Fault Detection," Invention Disclosure, University of Central Florida, February 9, 2005. Merged with invention disclosure leading to United States Patent #7,389,460.
6. R. F. DeMara and H. Tan, "Multi-layer Runtime Reconfiguration Architecture," U.S. Federal Software Copyright registered by University of Central Florida on August 30, 2005.
7. R. F. DeMara, "Replicated Global Image Memory System," Invention Disclosure, approved for Patent Application by University of Central Florida Patent Review Committee, 1999.

G. Recent Invited Seminars

- R. F. DeMara, "Opportunities for Scaling-up Digital Learning in STEM Disciplines," *Leading Edifying Dialogues (LED) Speaker Series*, Orlando, FL, November 13, 2019.
- R. F. DeMara, "Adaptive, Resilient, and Secure CMOS & Spin-based Computing," *UCF Electrical and Computer Engineering Graduate Seminar Speaker Series*, November 8, 2019.
- R. F. DeMara, "NSF University/Industry Partnership Workshop on The Future of Work at the Human-Technology Frontier," *University Industry Demonstration Partnership (UIDP)*, September 24, 2019.
- R. F. DeMara, "Technology-Enhanced Learning in CECS: Outcomes & Opportunities for Instructional Excellence," *UCF Board of Trustees Meeting*, September 19, 2019.
- R. F. DeMara, "Facilitating Collective Impact in Academia: A Case Study in Instructional Transformation," *Marchioli Collective Impact Series*, Orlando, FL, November 14, 2018.
- R. F. DeMara, "Leveraging Post-CMOS Spin-based Devices for Neuromorphic and Secure Computing," *IEEE Speaker Series – USF Branch*, University of South Florida, October 23, 2018.
- R. F. DeMara, "Digitally-Mediated Team Learning in the STEM Classroom," *Active Learning in STEM Seminar Series,* College of Engineering and Computer Science, UCF. October 15, 2018.
- R. F. DeMara, "Neuromorphic Computing using Intrinsically-Stochastic Spin-based Devices," *Purdue University*, October 9, 2018.
- R. F. DeMara, "Boltzmann Machines and Spiking Neural Networks using Probabilistic Spin Logic," *SRC e-Workshop,* USA / Europe: 11:00AM, International (Asia/Pacific) 8:00PM, July 31, 2018.
- R. F. DeMara, "Transformational Technologies for STEM Learning: Curriculum Integration – Initiatives & Outcomes," *Microsoft MOU / VP Presentation,* Orlando, FL, June 19, 2018.
- R. F. DeMara, "Technology-Enhanced Assessment from EPC to Peer Learning Cohorts," *UCF College of Sciences Administration,* Orlando, FL, July 26, 2018.
- R. F. DeMara, "2-Year to 4-Year Curricula Alignment for Digitized Engineering Assessment," *Seminole State College,* Oviedo, FL, March 23, 2018. *(Invited Presentation)*
- R. F. DeMara, "Integrated Testing and Tutoring for Engineering Curricula," *UCF Provost Forum*, Orlando, FL, December 6, 2017. *(Invited Presentation)*
- R. F. DeMara, "Pathways to Digitization of Computer Engineering Core Coursework: Assessments, Video Lectures, and Group Session Instructional Technologies," *San Francisco Bay Area Alumni Reception and Dinner*, Fremont, CA, June 28, 2017. *(Invited Presentation)*
- R. F. DeMara, "The Role of Reconfigurable Computing Architectures in the era of Cloud Computing and Data Analytics," *24th Annual IEEE Reconfigurable Architectures Workshop*, May 29, 2017. *(Invited Panel Presentation)*
- R. F. DeMara, "Heterogeneous Technology Configurable Fabrics: Leveraging Reconfiguration as a Pathway Towards Emerging Devices," *24th Annual IEEE Reconfigurable Architectures Workshop*, May 29, 2017. *(Keynote Speaker)*

- R. F. DeMara, "Digitization Initiatives: Concepts, Status, & Opportunities to Transform STEM Learning," *UCF Mechanical Engineering Faculty Retreat*, December 3, 2016. *(Invited Speaker)*.
- R. F. DeMara, "Evaluation and Proficiency Center for Assessment Digitization Innovation," *UCF Deans Advisory Board*, November 8, 2015. *(Invited Speaker)*
- R. F. DeMara, "Self-tuning Critical Paths for Nanometer-scale CMOS Aging and PVT Mitigation," *National Science Foundation MIST Center Kickoff Meeting*, December 11 – 12, 2014. *(Research Speaker)*
- R. F. DeMara, "Autonomic Refurbishment of Reconfigurable Datapaths for High-Availability Mission-Critical Architectures," *Workshop on Highly-Reliable Power-Efficient Embedded Designs (HARSH 2014)*, February 16, 2014. *(Invited Speaker)*
- R. F. DeMara, "Evolvable Hardware Methods Using Reconfigurable Fabrics," *IEEE International Conference on Reconfigurable Computing and FPGAs*, San Luis Potosi, Mexico, September 20 – 22, 2006. *(Keynote Speaker)*

H. Research Laboratory Leadership

- Founder and Director:
  - *Computer Architecture Laboratory* – University of Central Florida
    Involves 3 other faculty and 8 graduate students, http://cal.ucf.edu
- Co-Founder and Co-Director:
  - *Intelligent Systems Laboratory* – University of Central Florida
    Involves 1 other faculty and several graduate/honors students, http://isl.ucf.edu

I. Post-Doctoral Supervision

- Dr. Jafaar Alghazo, Post-Doctoral Researcher from Southern Illinois University, Carbondale, Illinois, U.S.A., at UCF Campus during 2007 – 2008 academic year.
- Dr. Ayman Alnsour, Post-Doctoral Researcher from Al-Isra University, Amman, Jordan, at UCF Campus during 2007 – 2008 academic year.

J. Institutional Review Board (IRB) Sanctioned Studies Conducted

- "DCL: Synthesis and Design Workshop on Digitally-Mediated Team Learning" PI: R. F. DeMara, Co-PI: L. Campbell, R. Hartshorne. SBE-18-14288. Domain: STEM Education Research.
- "Quantitative Impact on Learning Achievement by Engaging Testing using Lockdown Assessment for an Online Class" PI: M. Nader, Co-PI: R. DeMara. SBE-18-14144. Domain: STEM Education Research.
- "Digitally-Mediated Team Learning" PI: T. Tian, Co-PI: R. F. DeMara. SBE-18-13804. Domain: STEM Education Research.
- "Computer-Based Quizzes and Remediation" PI: D. Turgut, Co-PI: R. F. DeMara. Domain: STEM Education Research.

- "Examining the Effectiveness of EPIC (Evaluation and Proficiency Infrastructure & Curricula) for Adaptive Mastery STEM Learning" PI: R. F. DeMara, Co-PIs: B. Chen, R. Hartshorne. SBE-15-11487. Domain: STEM Education Research.
- "Exploring Factors That Influence STEM Faculty Perceptions and Use of Digital Tools for Flipping Classrooms" PI: T. Tian, Co-PI: R. F. DeMara. SBE-16-12748. Domain: STEM Education Research.
- "A crossover study on examining the effectiveness of Digitized Exams in the course of Heat Transfer" PI: T. Tian, Co-PI: R. F. DeMara. SBE 16-12702. Domain: STEM Education Research.
- "Examining the Effectiveness of Course Exam Preparation through Directed Video Blogging" PI: R. F. DeMara. SBE-15-11714. Domain: STEM Education Research.

K. Workshops/Panels Created and Delivered in Last Five Years

- Moderator and Organizer of Panel on "NVM Devices for Machine Learning, Security, and IOT" at ACM/IEEE GLSVLSI-2022.
- Educational Exhibit on "Digital Learning Initiatives at UCF CECS" at *IEEE Conference on Frontiers in Education (FIE-2019)*, Cincinnati, OH, USA, October 16 – 19, 2019. Creation and 4-day staffing of 10'x10' booth.
  - Evaluation and Proficiency Centers (EPCs) for Digitizing and Remediating Assessments.
  - GLASS Framework for synchronous in-class problem-solving.
- Organizer and Creator of "Workshop on Virtualized Active Learning in STEM," a pre-conference workshop at *IEEE Conference on Frontiers in Education (FIE-2019)*, Cincinnati, OH, USA, October 16 – 19, 2019.
  - Targeted for instructors, course designers, and researchers seeking to utilize and adapt digital environments for active learning within STEM curricula.
  - Provided immersive active learning exercises for problem-based learning that leverage observable, traceable, and autograding assessment tools for scalability and real-time orchestration of instruction.
- Founding General Chair and Program Chair of "Workshop on Digitally-Mediated Team Learning," Orlando, FL, USA, March 31-April 2, 2019.
  - Convened 84 faculty researchers from 44 institutions for 3-day workshop advancing transformative pedagogical approaches for technology-enhanced team learning within STEM disciplines at the college-level and grades 6-12.
  - Resulted in 100+ page White Paper of research and funding priority recommendations commissioned by *National Science Foundation (NSF) Division of Research on Learning (DRL).*
- Organizer, Creator, and Convener of "Faculty Development Workshop on Assessment Digitization Innovation," Orlando, FL, delivered at three annual offerings during May – June 2018, June – August 2017, and June – August 2016.
  - Created and offered 6-week Faculty Development Workshop to 30 Engineering and Science faculty to digitize and remediating STEM assessments
  - Refined over three years of delivery and also made available electronically on YouTube

VI. Professional Service

A. International

- Keynote Speaker of IEEE Conferences:
  - Keynote Speaker: *IEEE Dallas Conference on Circuits and Systems (IEEE DCAS),* Dallas, Texas, Apri 11, 2026.
  - Keynote Speaker: *IEEE International Symposium on Smart Electronic Systems (IEEE iSES),* Ahmedabad, India, December 18 - 20, 2023.
  - Keynote Speaker: *IEEE International IOT, Electronics, and Mechatronics Conference (IEEE IEMtronics)*, Vancouver, WA, USA, September 9 - 12, 2020.
  - Keynote Speaker: *24th Annual IEEE Reconfigurable Architectures Workshop (IEEE RAW)*, Orlando, FL, USA, May 29, 2017.
  - Keynote Speaker: *IEEE International Conference on Reconfigurable Computing and FPGAs (IEEE ReConFig)*, San Luis Potosi, Mexico, September 20, 2006.
- Editorships:
  - **Guest Editor**, along with Dr. Ashiq Sakib, of special issue on "*Design of Low-Power Circuits and Systems*" in Electronics, 2025
  - **Supervising Editor** – *IEEE Transactions on Emerging Topics in Computing*: Special Section on "Emerging In-Memory Computing Architectures and Applications", Vol 12, No. 1, Jan - March 2024
  - **Associate Editor** – *IEEE Transactions on Emerging Topics in Computing*: 2019 – 2023
  - **Editorial Advisory Board** - *IEEE Spectrum*: 2020 – 2022
  - **Senior Editor / Topical Editor** – *IEEE Transactions on Computers*: 2017 – 2018
  - **Supervising Editor** – *IEEE Transactions on Computers* Special Section on "Emerging Non-volatile Memory Technologies" 2017 – 2019 service for June 2019 issue
  - **Guest Editor** – *Journal of Low Power Electronics and Applications*, Special Section on "Energy-Aware Neuromorphic Hardware" 2017 – 2018 service for October 2018 issue: http://cal.ucf.edu/JLPEA_CFP.pdf
  - **Lead Guest Editor** – *IEEE Transactions on Emerging Topics in Computing*, joint with *IEEE Transactions on Computers* Special Section on "Innovation in Reconfigurable Computing Fabrics: from Devices to Architectures" 2015 – 2016 service for June 2017 issue: http://cal.ucf.edu/callforpaper.html
  - **Associate Editor** – *IEEE Transactions on Computers*: 2015 – 2017
  - **Associate Editor** – *IEEE Transactions on Computers*: 2013 – 2015
  - **Associate Guest Editor** – *ACM Transactions on Embedded Computing Systems,* special issue on "Configuring Algorithms, Processes and Architectures," 2009
  - **Associate Editor** – *IEEE Transactions on Very Large Scale Integration (VLSI) Systems:* 2004 – 2007
  - **Editorial Board** – *Microprocessors and Microsystems*: 2006 – 2008

– **Associate Editor** – *Journal of Circuits, Systems, and Computers*: 2004 – 2006

- International Service - Officer of Professional Organization:
  - *IEEE Computer Society Awards Committee* – 2023, observer
  - *IEEE Computer Society Awards Committee* – 2022, observer
  - *IEEE Computer Society Awards Committee* – 2021, voting member at-large
  - *IEEE Computer Society Awards Committee* – 2020, voting member at-large
  - *IEEE Computer Society Awards Committee* – 2019, voting member at-large
  - *IEEE Computer Society Awards Committee* – 2018, voting member at-large
  - Voting member-at-large on over a dozen technical awards such as *Charles Babbage Award*, *Seymour Cray Award*, *Computer Pioneer Award*, *Eckert-Mauchly Award*, etc.
- IEEE Professional Award Committee Chair:
  - IEEE Computer Society Joint Award with Information Processing Society of Japan – 2019-2022

    "IPSJ/IEEE Computer Society Innovation Award for Young Computer Researcher": inaugural/founding/operational service
    - Formed inaugural award guidelines via IEEE and IPSJ negotiation process over a period of months during 2018 then chaired the IEEE committee for two years
    - Committee member selection, conducted candidate post screening, and selection
- General Chair / Program Chair
  - Founder and General Co-Chair, ACM/IEEE Microelectronic Systems Education Workshop *(MSEW) Co-Located with GLSVLSI, July 1, 2025*
  - General Co-Chair, *33rd ACM Great Lakes Symposium on VLSI (GLSVLSI-2023), June 6-8, 2023*
  - Technical Program Co-Chair, *32nd ACM Great Lakes Symposium on VLSI (GLSVLSI-2022)*
  - Founding General Chair and Program Chair of "Workshop on Digitally-Mediated Team Learning," Orlando, FL March 31 – April 2, 2019.
- Technical Program Committee (TPC) member:
  - *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, Digital Circuits; FPGA-Based design; and VLSI for Applied and Future Computing tracks: 2015 – 2020
  - *IEEE Non-Volatile Memory Systems and Applications Symposium (IEEE NVMSA): 2018 – present*
  - *IEEE Symposium Series on Computational Intelligence (SSCI):* 2016 – 2019
  - *IEEE International Conference on Evolvable Systems (ICES):* 2015
  - *IEEE International Conference on Computer Design (ICCD): 2020-2021*
  - *IEEE Workshop on Energy-Efficient Big Data Analytics: 2018 – 2019*
  - *IEEE Conference on High Performance Compilation, Computing and Communication (HP3C-2014)* - Track 9: High-performance Self-adaptive and Resource-aware Programming, 2014.
  - *IEEE Congress on Evolutionary Computation: 2010*
  - *International Conference on Field Programmable Logic and Applications*: 2008
  - *Genetic and Evolutionary Computation Conference*: 2008, 2009
  - *NASA/DoD Conference on Evolvable Hardware*: 2005, 2006, 2007, 2008
  - *International Conference on Evolvable Systems*: 2008
  - *International Conf. on Parallel and Distributed Proc. Techniques and Appl.* 2004, 2005

- *IEEE World Congress on Computational Intelligence:* 1993

- Executive Committee:
  - *International Conference on Engr. of Reconfigurable Systems and Algorithms*, 2008.

- Steering Committee:
  - *ACM/IEEE Great Lakes Symposium on VLSI (GLSVLSI), 2023-present*
  - *International Conference on Engr. of Reconfigurable Systems and Algorithms*, 2005, 2006, 2007

- Discussion Panelist:
  - "NSF University/Industry Partnership Workshop on The Future of Work at the Human-Technology Frontier," *University Industry Demonstration Partnership (UIDP)*, September 24, 2019.
  - *24th Annual IEEE Reconfigurable Architectures Workshop*, 2017.
  - Signal-Image Processing and Dynamic Partial Reconfiguration," *International Conf. on Engineering of Reconfigurable Systems and Algorithms*, 2010.
  - *IEEE Conference on AI for Applications*, 1993.

- Special Session Organizer / Panel Moderator:
  - Panel Organizer and Chair, "GenAI in Hardware Design: Revolution or Risk" ACM Design Automation Conference (DAC), San Francisco, CA, June 2025
  - Panel Organizer and Chair, "GenAI in Microelectronics Education" Microelectronics Systems Education Workshop, New Orleans, LA, July 2025.
  - Panelist, "Panel Session 1: Circuit and System Research and Education in the Era of Large Language Models" ACM/IEEE GLSVLSI-2026, New Orleans, LA, July 2025.
  - Moderator and Organizer of Panel on "NVM Devices for Machine Learning, Security, and IOT" at ACM/IEEE GLSVLSI-2022.
  - Co-Organizer of "Cyberlearning Roundtable Sessions" at *NSF Conference on Cyberlearning (CL-2019)*, Alexandria, VA, USA, October 3 – 4, 2019
  - Organizer and Creator of "Workshop on Virtualized Active Learning in STEM," a pre-conference workshop at *IEEE Conference on Frontiers in Education (FIE-2019)*, Cincinnati, OH, USA, October 16 – 19, 2019.
  - Founding Track Chair and Panel Moderator of "In-Memory Processing for Future Electronics" at *ACM Great Lakes Symposium on VLSI (GLSVLSI)*, 2019.
  - Panel Organizer and Moderator of "The Future of Cooperative Learning in STEM: 1, 3, and 5 Year Research" at *Digitally-Mediated Team Learning Workshop (DMTL)*, 2019.
  - Panel Organizer and Moderator of "Digitizing and Remediating STEM Assessments," *Assessment Digitization Innovation Workshop*, 2016, 2017, 2018.
  - Panel Organizer and Moderator of "Signal-Image Processing and Dynamic Partial Reconfiguration," *International Conf. on Engineering of Reconfigurable Systems and eAlgorithms*, 2010.

- Local Arrangements Chair:
  - *24th Annual IEEE Reconfigurable Architectures Workshop*, 2017.

- Awards Selection Committee Chair / Member
  - *IEEE International Conference on Reconfigurable Computing and FPGAs (ReConFig),* December 2019.
  - *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, 2019.
  - *24th Annual IEEE Reconfigurable Architectures Workshop*, 2017.
  - Awards Selection Chair for *International Conference on e-Learning (ICEL)*, 2017.
- Technical Session Chair and/or Organizer:
  - *ACM Annual Southeast Conference (ACMSE-2020)*, January 2020.
  - *IEEE International Conference on Reconfigurable Computing and FPGAs (ReConFig),* December 2019.
  - "Digital Circuits and FPGA based Designs" at *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, May 2019.
  - "Emerging and Post-CMOS Technologies" at *IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, May 2019.
  - "Machine Learning in Conventional and Emerging Platforms" at *20th IEEE International Symposium on Quality Electronic Design (ISQED)*, 2019.
  - "Emerging Computing, and Post-CMOS Technologies" at *27th ACM Great Lakes Symposium on VLSI (GLSVLSI)*, 2018.
  - *"*ECE Division Technical Session" at *American Society for Engineering Education Annual Conference (ASEE),* 2017.
  - "Runtime Resource Management of Reconfigurable Hardware"– *International Conf. on Engineering of Reconfigurable Systems and Algorithms*, 2007.
  - "Runtime Reconfiguration Resource Management"– *International Conf. on Engineering of Reconfigurable Systems and Algorithms*, 2006.
  - "Distributed and Heterogeneous Reconfigurable Systems"– *International Conference on Advances in Computer Science and Technology*, 2006/
  - "Computer Architecture"– *International Conference on Advances in Computer Science and Technology*, 2006.
  - "Adaptive Self-Repair of Reconfigurable Devices" – *NASA/DoD Conference on Evolvable Hardware*, 2005.
  - "Device & Circuit Design" – *International Conference on VLSI*, 2004.
  - "System/Network-on-a-Chip" – *International Conference on VLSI*, 2004.
  - "Logic Design" – *International Conference on VLSI*, 2004.
- Technical Paper Reviewer/Referee for the following Journals:
  (multiple years of service: 1990 – present)
  - *IEEE Transactions on Computers*
  - *IEEE Transactions on Emerging Topics in Computing*
  - *IEEE Transactions on Parallel and Distributed Systems*
  - *IEEE Transactions on VLSI Systems*
  - *IEEE Transactions on Evolutionary Computation*
  - *IEEE Transactions on Circuits and Systems*

- *IEEE Transactions on Nanotechnology*
- *IEEE Transactions on Neural Networks*
- *IEEE Transactions on Aerospace Electronic Systems*
- *IEEE Journal of Exploratory Solid-State Computational Devices and Circuits*
- *IEEE Micro*
- *IEEE Access*
- *IEEE Consumer Electronics Magazine*
- *Microelectronics Reliability*
- *Nature Electronics*
- *Journal of Parallel and Distributed Computing*
- *Journal of Autonomous and Multi-Agent Systems*
- *Journal of Simulation Modeling Practice and Theory*
- *Journal of Defense Modeling and Simulation*
- *Journal of Supercomputing*
- *Microprocessors and Microsystems*
- *Integration, The VLSI Journal*
- *ACM Transactions on Design Automation of Electronic Systems*
- *Operating Systems Review*
- *Journal of Supercomputing*
- *IET Circuits, Devices & Systems*
- *IEEE IT Professional magazine*
- *International Journal of Network Management*
- *SciTechnol Journal*
- *Design Automation for Embedded Systems*
- *Nature Communications*
- *Genetic Programming and Evolvable Machines*

- Technical Paper Reviewer/Referee for the following Conferences, Workshops, and Symposia: (multiple years of service: 1990 – present)
  - *International Symposium on High Performance Computer Architecture (ISHPCA)*
  - *International Conference on Parallel Processing (ICPP)*
  - *International Conference on Parallel and Distributed Computer Systems (ICPDS)*
  - *International Parallel (and Distributed) Processing Symposium (IPDPS)*
  - *International Joint Conference on Artificial Intelligence (IJCAI)*
  - *International Symposium on Computer and Information Sciences (ISCIS)*
  - *International Symposium on Circuits and Systems (ISCS)*
  - *International Symposium on Low Power Electronics and Design (ISLPED)*
  - *International Conference on Engr. of Reconfigurable Systems and Alg. (ERSA)*
  - *NASA/DoD Conference on Evolvable Hardware (EH)*
  - *European Design and Test Conference (EDTC)*
  - *SPIE Aerosense Symposium (Aerosense)*
  - *Hawaii International Conference on Systems Sciences (HICSS)*
  - *International Conference on Field Programmable Logic and Applications (FPL)*
  - *Genetic and Evolutionary Computation Conference (GECCO)*

- *International Conference on Evolvable Systems (ICES)*
- *IEEE Symposium Series on Computational Intelligence (IEEE SSCI)*

- Panelist: IEEE Member Rank Elevation Panel – consisting of IEEE Senior Members and Fellows whom determine increases to Senior Member rank among IEEE applicants, 2005

B. National and Regional

- Proposal/Award Panelist/Reviewer:
  - National Science Foundation – multiple years of service:
    - *Computer/Information Science & Engineering (CISE) Directorate:* multiple programs
    - *Education and Human Resources (EHR) Directorate:* multiple programs
    - *Graduate Research Fellowship Program (GRFP)*
    - *REU Site on IoT: Research Evaluator*
  - American Society for Engineering Education, Southeast Section
    - Referee for *Outstanding Researcher Award*
- Officer: Computer and Technology Division – ASEE Southeast Section: 1999 – 2000
- Technical Program Committee:
  - *IEEE Southcon / Southeastcon Conference*: 1994, 1998
  - *ASEE Southeastern Conference*: 1998, 1999
- Conference Technical Session Chair/Organizer:
  - "Parallel Processing Architectures" – *IEEE Southcon Conference*: 1994, 1998
  - "Computing in Education" – *IEEE Southcon / Southeastcon Conference*: 1998, 1994
- Technical Paper Reviewer/Referee for Conferences:
  - *IEEE Southcon / Southeastcon*
  - *ASEE Southeastern Conference*
- External Promotion and Tenure Evaluator:
  - Multiple universities on multiple occasions since 2008
- Textbook Reviewer:
  - McGraw-Hill Publishers: Higher Education Division – prepared complete textbook review 2007
  - CRC Press/Taylor & Francis) – early 2000s and in 2019 prepared a Book Proposal Review upon request as uncompensated professional service

C. University-Level

- Pegasus Professor Advisory Group: 2020 – present
- Marchioli Collective Impact Award Selection Committee: 2019 – 2020
- Undergraduate Course Review Committee: 2015 – 2016
- University TIP/RIA/SOTL Awards C?ommittee: 2014 – 2015
- University Promotion and Tenure Committee: 2007 – 2008
- University SOTL Award Selection Committee: 2011 – 2012
- Graduate Research Forum: 2010 – 2011, 2009 – 2010
- Graduate Council: 2004 – 2005

- Faculty Senate: 2005 – 2006, 2004 – 2005
- Commencement Marshall: 2003, 1997, 1994
- Faculty Advisor to IEEE Student Organization: 1995 – 1996, 1994 – 1995, 1993 – 1994

D. College-Level

- Teaching and Learning Committee: 2019 – 2020, 2020-2021
- EPC Staff Member Hiring Committee: 2015 – 2016, 2020-2021
- Graduate Program College Council: 2009 – 2013
- Teaching Award Criteria Committee: 2007 – 2008, 2003 – 2004, 1999 – 2000
- Accreditation Committee: 2006 – 2007, 2007 – 2008, 2008 – 2009, 2009 – 2010
- Engineering Graduate Council: 2004 – 2005
- In-House Grant Selection Committee: 2004 – 2005, 2003 – 2004
- Research Council: 2003 – 2004
- Teaching Award Selection Committee: 2000 – 2001, 1997 – 1998
- Research Award Selection Committee: 2004 – 2005, 2009 – 2010
- Computing Resources Committee: 2000 – 2001, 1999 – 2000, 1997 – 1998, 1995 – 1996, 1994 – 1995
- Dean's Advisory Board: 1994 – 1995

E. Department-Level

- Academic Issues:
  - Development Committee: 2023-2024, 2025-2026
  - Department Chair 5-Year Review Committee: 2015 – 2016
  - State Program Review Committee: 2010 - 2011
  - EPC / Lab / Computer Systems Committee: 2020 – 2021, 2019 – 2020, 2018 – 2019, 2017 – 2018, 2016 – 2017, 2015 – 2016, 2010 – 2011, 2009 – 2010, 2008 – 2009, 2007 – 2008, 2006 – 2007, 2005 – 2006, 2004 – 2005, 2003 – 2004, 2000 – 2001, 1999 – 2000, 1998 – 1999, 1997 – 1998, 1996 – 1997, 1995 – 1996, 1994 – 1995, 1993 – 1994
  - Graduate Program Committee: 2014 – 2015, 2010 – 2011, 2009 – 2010, 2005 – 2006, 2004 – 2005, 2003 – 2004, 1999 – 2000, 1998 – 1999, 1994 – 1995, 1993 – 1994
  - Undergraduate Curriculum Committee: 2018 – 2019, 2017 – 2018, 2016 – 2017, 2015 – 2016, 2005 – 2006, 1997 – 1998, 1996 – 1997, 1994 – 1995
  - Accreditation Committee(s): 2014 – 2015, 2013 – 2012, 2012 – 2011, 2010 – 2011, 2009 – 2010, 2008 – 2009, 2007 – 2008, 2006 – 2007, 2000 – 2001, 1997 – 1998, 1994 – 1995
  - Undergraduate Curriculum Revision and Merging: 2009 – 2010, 2006 – 2007
  - Graduate Qualifying Exam Format Ad Hoc Committee: 2007 – 2008, 2006 – 2007
- Planning and Development:
  - Administrative Committee: 2014 – 2015, 2013 – 2012, 2012 – 2011, 2010 – 2011, 2009 – 2010
  - Advisory Committee: 2020 – 2021, 2019 – 2020, 2018 – 2019, 2017 – 2018, 2016 – 2017, 2015 – 2016, 2014 – 2015, 2013 – 2012, 2012 – 2011, 2010 – 2011, 2009 – 2010
  - Faculty Mentor assigned to Junior ECE Faculty: 2016 – 2017, 2015 – 2016, 2014 – 2015, 2014 – 2013, 2013 – 2012, 2011 – 2012, 2010 – 2011 (2 faculty), 2009 – 2010, 2008 – 2009, 2007 – 2008, 2006 – 2007, 2005 – 2006, 2004 – 2005, 2003 – 2004, 2002 – 2003

- Strategic Planning Committee: 2013 – 2014, 2010 – 2011, 2004 – 2005
- Ph.D. Fellowship Committee: 2004 – 2005, 2000 – 2001
- Industrial Advisory Committee: 2014 – 2015, 1994 – 1995
- Indonesia Exchange Committee: 1994 – 1995

- Infrastructure and Operations:
  - Engineering III Building Committee: 2004 – 2005
  - Computing Resources Committee: 1999 – 2000, 1997 – 1998, 1995 – 1996, 1994 – 1995
  - Lab Director: Microprocessor Lab, Open Computing Lab, Computer Architecture Lab: 1993 – present
  - Lab Faculty: Intelligent Systems Lab, VLSI Lab: 1998 – 2004

- Evaluation and Recognition:
  - Evaluation Standards Committee: 2015 – 2016, 2014 – 2015, 2011 – 2012
  - Faculty Excellence Awards Committee: 2005 – 2006
  - Promotion and Tenure Committee: 2016 – 2017, 2015 – 2016, 2014 – 2015, 2014 – 2013, 2013 – 2012, 2011 – 2012, 2010 – 2011, 2005 – 2006, 2004 – 2005, 2003 – 2004, 2002 – 2003, 1999 – 2000
  - Promotion and Tenure Guidelines Committee: 2005 – 2006, 2004 – 2005

- Merit Raise Guidelines Committee: 2014 – 2005

- Recruiting:
  - Faculty Search Committee: 2023-2024, 2022-2023, 2015 – 2016, 2014 - 2015, 2009 – 2010, 2006 – 2007, 2005 – 2006, 2003 – 2004, 2000 – 2001, 1998 – 1999, 1997 – 1998, 1996 – 1997, 1995 – 1996, 1994 – 1995
  - Department Chair Search Committee: 2003 – 2004
  - Staff Search Committees: 2015 – 2016, 2010 – 2011, 2009 – 2010, 1995 – 1996, 1994 – 1995

F. Academic Program Leadership

- Computer Engineering Program Coordinator

  Computer Engineering Undergraduate and Graduate Degree Programs and their Administration

  University of Central Florida, Department of EECS: 2010 – 2015
  - Determined CpE course offerings and submit teaching requests
  - Addressed accreditation issues and curriculum renewal specific to CpE degree program and CpE-specific courses
  - Orchestrated allocation of CpE program-specific resources
  - Coordinated strategic planning issues including enrollment trends and faculty recruiting
  - Maintenance of degree requirements, catalogs, and coordination of Bachelors of Science, Masters of Science, and Ph.D degree programs
- Graduate Coordinator

  Master of Science program in Computer Engineering, Masters of Science program in Electrical Engineering, Ph.D. program in Computer Engineering, Ph.D. program in Electrical Engineering, Accelerated BS+MS degree program in Computer Engineering, Accelerated BS+MS degree program in Electrical Engineering

University of Central Florida, School/Department of EECS: Dec. 2009 – August 2012

- Chaired and convened the ECE Graduate Committee, taking care of all graduate matters, such as curriculum changes, new course recommendations, new graduate policies, Qualifying review decisions, etc.
- Processed admissions of new MS and Ph.D. students in EE and CpE Programs on a daily rolling basis
- Reviewed and approved the Programs of Study for MS and Ph.D. students including revisions
- Assigned and oversaw contracting of 35 to 40 Teaching Assistants and/or Graders each semester to specific courses
- Hired and trained three dedicated staff members to support ECE Graduate Office
- Organized and coordinated the Qualifying Reviews and Annual Reviews of all Ph.D. students
- Reviewed the portfolios of non-thesis Master students
- Oversaw the fellowship and TA stipends' allocation for new incoming Ph.D. students
- Conducted Graduate Orientation seminar each Fall and Spring for newly admitted students
- Advised on daily basis EE and CpE graduate students on questions regarding admissions, programs of study, petitions, etc.
- Certified students for graduation at end of every semester
- Revamped joint faculty appointment criteria
- Processed regular and special topic Course Action Requests, Graduate Scholar requests, and Catalog revisions, and Articulation updates
- Designed an electronic database flow for graduate students towards electronic record-keeping of all their achieved milestones.
- Conducted graduate affairs at ECE faculty meetings.

- Accreditation Coordinator

University of Central Florida, School of EECS: 2009 – 2010, 2008 – 2007 (CpE), 2007 – 2008 (CpE), 2006 – 2007 (CpE)

- organized ABET accreditation and SACS assessment activities
- led curriculum renewal and laboratory revitalization efforts

- Associate Chair and Computer Engineering Program Coordinator

ECE Department, University of Central Florida, ECE Department: 1994 – 1995

- led curriculum renewal and laboratory revitalization efforts
- organized ABET accreditation and SACS assessment activities
- developed advising procedure and determined course scheduling/staffing and petitions
- supervised Computer Technicians, Administrative Staff, Student Assistants

- Founding Director
  - UCF Evaluation and Proficiency Center, 2014-present
  - 120-seat integrated testing and tutoring center

G. Academic Committee Chairship

- Chair, CECS College Committee on Teaching and Learning: 2020 – 2021, 2019 – 2020
- Chair, EECS/ECE Department Digital Systems and Computer Architecture Technical Area Committee: 2024 – 2025, 2014 - 2015, 2013 - 2014, 2011 – 2012, 2010 – 2011, 2009 – 2010,

2007 – 2008, 2006 – 2007, 2005 – 2006, 2004 – 2005, 2003 – 2004, 2000 – 2001, 1997 – 1998, 1995 – 1996, 1993 – 1994

- Chair, ECE Department Evaluation Committee: 2004 – 2005
- Chair, School of Electrical Engineering and Computer Science Promotion and Tenure Committee: 2009 – 2010 (evaluated eleven faculty), 2005 – 2006 (evaluated eleven faculty), 2002 – 2003 (evaluated 7 faculty)
- Chair, ECE Department Faculty Search Committee: 2023 – 2024 (2 faculty hired), 2022 – 2023 (5 faculty hired), 2015 – 2016 (2 faculty hired), 2014 – 2015 (1 faculty hired), 2011 – 2012 (1 faculty hired), 2011 – 2012 (1 lecturer hired), 2009 – 2010 (3 faculty hired), 2006 – 2007 (4 faculty hired), 2000 – 2001 (3 faculty hired), 1996 – 1997 (1 faculty hired), 1994 – 1995 (3 faculty hired)
- Chair, College of Engineering Teaching Award Criteria Committee: 2005 – 2006, 1999 – 2000
- Chair, College of Engineering Teaching Award Selection Committee: 1997 – 1998
- Chair, ECE Department Computing Resources Committee: 1997 – 1998, 1995 – 1996, 1994 – 1995
- Chair, ECE Department Technician Search Committee: 1995 – 1996
- Chair, ECE Department Laboratory Committee: 1995 – 1996
- Chair, ECE Department Indonesia Exchange Committee: 1994 – 1995
- Chair, ECE Department Accreditation Committee: 1994 – 1995

VII. Affiliations and Certifications

A. Professional Societies

- Fellow of *Institute of Electrical and Electronics Engineers (IEEE)* with citation:
  "For contributions to runtime reconfigurable computing and resilient datapath design"
- Fellow of *American Association for the Advancement of Science (AAAS)* with citation:
  "For outstanding contributions in computer systems design and architecture with emphasis on emerging computing devices for machine learning, adaptive and reconfigurable hardware, and digitization of STEM education"
- Fellow of the Asia-Pacific Artificial Intelligence Association (AAIA)
- Member of *Association for Computing Machinery (ACM)* (current)
- Member of *American Society for Engineering Education (ASEE)* (current)

B. Professional Certification

- State of California, Board of Engineers
  Registered Professional Engineer – Electrical Engineer, License Number E–13860 (current)
- University of Central Florida
  Online Course Development Certification – 80 contact hours IDL6543 completion, May 16, 2016

VIII. Recognitions and Awards

A. Research Recognitions

- Fellow of *Institute of Electrical and Electronics Engineers (IEEE)* class of 2025, with citation:
  "For contributions to runtime reconfigurable computing and resilient datapath design"
- Fellow of *American Association for the Advancement of Science (AAAS)*, class of 2022, with citation:
  "For outstanding contributions in computer systems design and architecture with emphasis on emerging computing devices for machine learning, adaptive and reconfigurable hardware, and digitization of STEM education"
- *Research Initiative Award (RIA):* "for outstanding research, scholarly, and creative activity" University of Central Florida, 2021 – 2022.
  – Monetary Amount: $5,000 permanent increase to 9-month salary
- *Top Five Published Faculty* at UCF, spanning College of Engineering and Computer Science, Research Centers, Medical School, and 13 College Units housing 200+ degree programs in 2019 calendar year, as announced in September 2020.
- *Pegasus Professor:* elevated to University Professor Rank as *"highest academic recognition available to a faculty member at UCF"* University of Central Florida, 2020.
  – Monetary Amount: $5,000 one-time award
- *Best Poster Award of the conference:* Computational Social Science Society of the Americas Annual Conference (CSSSA-2024):

  "Agent-Based Model for Optimal Remedial Staffing to Achieve Learning Outcomes within Cost Constraints," Poster presentation at, Santa Fe, NM, USA, October 24-27, 2024.
- *Featured Article on front cover of IEEE Computer magazine:*

  "Leveraging Stochasticity for In-Situ Learning in Binarized Deep Neural Networks," *Computer* (a.k.a. *IEEE Computer Magazine*), Vol. 52, No. 5, pp. 30-39, May 2019.
  - Featured Article on the Front Cover of the Issue
  - Selected to Special Issue on Cognitive Computing Systems and Applications
- *Best Poster Award of the conference:* 29th ACM Great Lakes Symposium on VLSI (GLSVLSI-2019):

  "AQuRate: MRAM-based Stochastic Oscillator for Adaptive Quantization Rate Sampling of Spectrally Sparse Signals"
- *Featured Article:* IEEE Transactions on Emerging Topics in Computing, October – December 2018, as featured on IEEE Transactions webpage:

  "A Parity-Preserving Reversible QCA Gate with Self-Checking Cascadable Resiliency," *IEEE Transactions on Emerging Topics in Computing*, Vol. 6, No. 3, pp. 450 – 459, October – December 2018. 10.1109/TETC.2016.2593634.

  Sole paper highlighted during the period on *IEEE Transactions on Emerging Topics in Computing* webpage. This includes free download worldwide. It was also selected to the Special Section on "Defect and Fault Tolerance in VLSI and Nanotechnology" as the anchor paper of the Special Issue.

- *Best Paper Award:* 28th ACM Great Lakes Symposium on VLSI (GLSVLSI-2018), 2nd place technical recognition:

  "Low-Energy Deep Belief Networks using Intrinsic Sigmoidal Spintronic-based Probabilistic Neurons"

- *Featured Article:* IEEE Transactions on Magnetics, February 2018, showcased on the journal's front cover having a full-cover 'teaser' image from the manuscript:

  "Compact Spintronic Muller C-Element with Near-Zero Standby Energy," *IEEE Transactions on Magnetics,* Vol. 54, No. 2, pp. 1 – 7, February 2018. DOI: 0.1109/TMAG.2017.2766600.

- *Paper of the Month:* IEEE Transactions on Computers, May 2017, with hosted companion video featured on IEEE Transactions webpage:

  "Energy-Aware Adaptive Restore Schemes for MLC STT-RAM Cache," *IEEE Transactions on Computers*, Vol. 66, No. 5, pp. 786 – 798, May 2017, doi:10.1109/TC.2016.2625245

- *Conference Best Paper Candidate / A Best Paper of Track:*

  "Variation-Immune Resistive Non-Volatile Memory using Self-Organized Sub-Bank Circuit Designs," in *Proceedings of 18th International Symposium on Quality Electronic Design (ISQED-2017)*, Santa Clara, CA, USA, March 13 – 15, 2017.

- *Highlighted Article*: IEEE Circuits and Systems (CAS) Society International Symposium (ISCAS) selection for lecture presentation as a highlighted Transactions article of the past year:

  "Energy and Delay Tradeoffs of Soft Error Masking for 16nm FinFET Logic Paths: Survey and Impact of Process Variation in Near Threshold Region," *IEEE Transactions on Circuits and Systems II*, Vol. 64, No. 6, pp. 695 – 699, June 2017, DOI: 10.1109/TCSII.2016.2587763.

- *Highlighted Article of Issue:* IET Electronics Letters, June 2016:

  "Compact Low-Power Instant Store and Restore D Flip-Flop using a Self-Complementing Spintronic Device," *IET Electronics Letters (IEEE-indexed)*, Vol. 52, No. 14, pp. 1238 – 1240, June 2016. DOI: 10.1049/el.2015.4114.

- *Paper of the Month*: IEEE Transactions on Computers, June 2016, with hosted companion video featured on IEEE Transactions webpage:

  "Loss-Aware Switch Design and Non-Blocking Detection Algorithm for Intra-Chip Scale Photonic Interconnection Networks," *IEEE Transaction on Computers*, Vol. 65, No. 6, June 2016, pp. 1789 – 1801. DOI: 10.1109/TC.2015.2458866.

- *Best Paper Award*: NASA/ESA Conference on Adaptive Hardware and Systems, Citation: "Best Design Paper of Conference:"

  S. D. Pyle, V. Thangavel, S. M. Williams, and R. F. DeMara, "Self-Scaling Evolution of Analog Computation Circuits with Digital Accuracy Refinement," in *IEEE Proceedings of NASA/ESA Conference on Adaptive Hardware and Systems (AHS 2015)*, Montreal, QC, Canada, June 15 – 18, 2015. *Best paper award of conference, Citation: "Best Design Paper."*

- *Research Initiative Award (RIA):* "for outstanding research, scholarly, and creative activity" University of Central Florida, 2008 – 2009.
  – Monetary Amount: $5,000 permanent increase to 9-month salary

- *Best Paper Award*: International Conference On Field Programmable Logic, Place & Route

R. S. Oreifej, R. N. Al-Haddad, H. Tan, R. F. DeMara, "Layered Approach To Intrinsic Evolvable Hardware Using Direct Bitstream Manipulation Of Virtex II Pro Device," in *Proceedings of the 17th International Conference On Field Programmable Logic And Applications (FPL'07*), Amsterdam, Netherlands, August 27 – 29, 2007. Conference acceptance rate 21%. Selected as best paper of track and nominated for best of conference.

- *Distinguished Researcher*: UCF College of Engineering and Computer Science, 2004 – 2005, Associate Professor level.

- *Best Paper Award*: WMSCI'05, Network Security Technologies session
  G. Wang, R. F. DeMara, A. J. Rocke, "Mobility-Enhanced File Integrity Analyzer For Networked Environments," in *Proceedings of the 9th World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI '05)*, pp. 341 – 346, Orlando, FL, U.S.A., July 10 – 13, 2005. Received *Best Paper Award*, Network Security and Security Technologies.

- *Researcher of the Year*: UCF Department of Electrical and Computer Engr., 2003 – 2004, Associate Professor level

- *Research Initiative Award (RIA):* for *"outstanding research, scholarly, and creative activity"* University of Central Florida, 2003 – 2004.
  – Monetary Amount: $5,000 permanent increase to 9-month salary

- *Distinguished Research Lecturer*: UCF College of Engineering, 2003 – 2004.
  – Monetary Amount: $2,000 one-time award

B. Teaching Recognitions

- *Excellence in Advising:* College of Engineering and Computer Science, University of Central Florida, 2023 – 2024.
- *Scholarship of Teaching and Learning (SoTL) Award*: for "outstanding contributions to the scholarship of teaching and learning within discipline or to the teaching and learning community" University-level, University of Central Florida, 2021 – 2022.
  – Monetary Amount: $5,000 permanent increase to 9-month salary
- *Teaching Initiative Program (TIP) Award:* for "sustaining high levels of teaching effectiveness" University of Central Florida, 2021 – 2022.
  – Monetary Amount: $5,000 permanent increase to 9-month salary
- *Digital Learning Faculty Fellow:* for "Facilitating Technology-Enhanced Learning in STEM Curricula," University of Central Florida, 2020 – 2021.
- *Award for Faculty Excellence in Mentoring Doctoral Students:* 2019-2020 Academic Year
  – solitary award annually in STEM Disciplines plus one outside of STEM if available
  – Monetary Amount: $1,500
- *Digital Learning Faculty Fellow:* for "Facilitating Technology-Enhanced Learning in STEM Curricula," University of Central Florida, 2019 – 2020.
  – Monetary Amount: $10,000
- *Online Learning Consortium (OLC) Effective Practice Award: 2018*
  – citation: "for Elevating Participation and Outcomes with Digitized Assessments in Large-Enrollment Foundational STEM Curricula: An immersive development workshop for STEM faculty."
  – OLC recognizes international-scale professional leadership dedicated to integrating online techniques into the mainstream of higher education, and had formerly been known as the Sloan Consortium.
  – awards the innovation, development, and leadership of the Evaluation and Proficiency Center (EPC) as a scalable and transportable methodology brought into practice within seven Engineering degree programs and also the Physics degree program.
  – within four years of its inception, the EPC at UCF serves 31 STEM courses that digitized their assessments having 10,000+ total enrollment annually with interwoven tutoring, asynchronous testing, and rapid post-test remediation.

- *Digital Learning Faculty Fellow:* for "Facilitating Technology-Enhanced Learning in STEM Curricula," University of Central Florida, 2018 – 2019.
  – Monetary Amount: $42,000 in combination of salary, travel, and student support

- *Scholarship of Teaching and Learning (SoTL) Award*: for "outstanding contributions to the scholarship of teaching and learning within discipline or to the teaching and learning community" University-level, University of Central Florida, 2016 – 2017.
  – Monetary Amount: $5,000 permanent increase to 9-month salary

- *Teaching Initiative Program (TIP) Award:* for "sustaining high levels of teaching effectiveness" University of Central Florida, 2016 – 2017.
  – Monetary Amount: $5,000 permanent increase to 9-month salary

- *Excellence in Undergraduate Teaching:* College of Engineering and Computer Science, University of Central Florida, February 2017.
  – Monetary Amount: $2,000 award

- *iSTEM Fellow:* 2015-2016 Academic Year
  – Monetary Amount: $20,000 discretionary funding for educational research

- *Outstanding Engineering Educator – IEEE Southeastern United States*:
  Joseph M. Biedenbach Outstanding Engineering Educator Award
  IEEE Professional Society – Region 3, April 2008.
  – Citation: "For Outstanding Contributions to Engineering Education in Computer Architecture and Intelligent Systems."
  – Award winner chosen from over 30,000 IEEE members in IEEE global Region 3.
  – IEEE Region 3 encompasses the southeastern United States and includes the states of Alabama, Florida, Georgia, areas of Indiana, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and the country of Jamaica.

- *Outstanding Engineering Educator – Florida*: IEEE Florida Council, December 2007.

- *Outstanding Engineering Educator – Orlando Section*: IEEE Orlando Section, September 2007.

- *Scholarship of Teaching and Learning (SoTL) Award*: for "outstanding contributions to the scholarship of teaching and learning within discipline or to the teaching and learning community" University-level, University of Central Florida, 2008 – 2009.
  – Monetary Amount: $5,000 permanent increase to 9-month salary

- *Teaching Initiative Program (TIP) Award:* for "sustaining high levels of teaching effectiveness" University of Central Florida, 2006 – 2007.
  – Monetary Amount: $5,000 permanent increase to 9-month salary

- *Excellence in Graduate Teaching*: UCF Dept. of Electrical and Computer Engr., 2004 – 2005.

- *Teaching Initiative Program (TIP) Award:* for "sustaining high levels of teaching effectiveness" University of Central Florida, 2001 – 2002.
  – Monetary Amount: $5,000 permanent increase to 9-month salary

- *Web-based Course Development Award*: IEEE Southeastcon, 1998.

- *Teaching Initiative Program (TIP) Award:* for "sustaining high levels of teaching effectiveness" State University System of Florida, 1996 – 1997.
  – Monetary Amount: $5,000 permanent increase to 9-month salary

- Nominated for *Humphrey Teaching Assistant Award*: Lehigh University, 1986 – 1987.

C. Professional Service Recognitions

- *Excellence in Professional Service:* Department of Electrical and Computer Engineering, University of Central Florida, 2023 – 2024.
- *Faculty Excellence Spotlight:*
  "Testing in the Age of Technology" University of Central Florida, 2018.
- *Marchioli Collective Impact Innovation Award:*
  "Recognizes one outstanding faculty member for transformative ideas which advance the university." Citation: Evaluation and Proficiency Center, University of Central Florida, 2017. Monetary Amount: $5,000.
- *Excellence in Professional Service*: School of Electrical Engineering and Computer Science, University of Central Florida, 2008 – 2009.
- *Achievement Award*: International Multiconference in Computer Science and Computer Engineering, 2005.
- *Faculty Advisor of the Year*: UCF College of Engineering, 1994 – 1995.
- *Faculty Advisor of the Year*: UCF Dept. of Electrical and Computer Engineering, 1994 – 1995.
- Nominated for *IEEE Student Organization Advisor of The Year,* 1995.
- *Special Appreciation Award for Outstanding Employee Contribution*, IBM Corporation, Manassas, Virginia, 1989.

D. Other Recognitions of Scholarship

- Eta Kappa Nu, Tau Beta Pi, and Phi Eta Sigma Honor Societies
- New York State *Regents Scholarship* and *Science Supervisors' Scholarship*
- Lehigh University Dean's List: semesters 1, 2, 3, 4, 6, 7, 8

IX. Personal Information

A. Citizenship

United States of America

B. Foreign Languages

New York Regents Certification in Spanish