

Maral Amir

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in [maralamir](#)

Education

- 2014–present **Ph.D. Degree in Computer Science, GPA: 3.91.**
Donald Bren School of Information and Computer Sciences, *University of California, Irvine*
- **Thesis:** Modeling and Design Automation Techniques for Embedded Systems
 - **Advisor:** Prof. Tony Givargis
- 2015–2017 **M.Sc. Degree in Computer Science, GPA: 3.91.**
Donald Bren School of Information and Computer Sciences, *University of California, Irvine*
- **Thesis:** How Cyber Properties Affect the Design Qualities of Embedded Systems
 - **Advisor:** Prof. Tony Givargis
- 2013–2014 **M.Sc. Degree in Embedded Electrical & Computer Systems, GPA: 3.91.**
School of Engineering, *San Francisco State University*
- **Thesis:** Modeling and Implementation of Bio-inspired Objects Detection Algorithm in Verilog and C++ language
 - **Advisor:** Prof. Hamid Mahmoodi
- 2006–2011 **B.Sc. Degree in Electrical Engineering, GPA: 3.52.**
Department of EECS, *Azad University Central Tehran Branch*
- **Thesis:** Design and Implementation of Digital Thermostat with AVR Microcontroller
 - **Advisor:** Prof. Reza Sabaghi

Work & Research Experience

- Sep 2014 – present **Research Assistant, CYBER-PHYSICAL SYSTEMS LAB, University Of California, Irvine.**
- **Dynamic Neural Networks.**
A novel neural network architecture that embeds multiple models into one with one-time training implemented(Tensorflow platform).
 - **Switching Predictive Control Using Multi-Grained State-Based Model.**
A novel switching predictive control method is proposed based on a model reduction scheme to achieve various performance granularities for path tracking in autonomous vehicles. (C/C++, MATLAB).
 - **Hybrid State Machine Model for Fast Model Predictive Control: Application to Path Tracking.**
Machine learning models are employed to develop a state-based model of a physical systems for model predictive control applications. (C/C++, MATLAB).
 - **Design Space Exploration Techniques for Embedded System Applications.**
The influence of cyber system parameters, such as cache size and CPU speed, on the overall control system performance is investigated in terms of precision or power (C++, MATLAB).
- Jun 2014 – **Graduate Student Mentor, NASA CIPAIR PROGRAM, San Francisco State University.**
- Aug 2014 ○ Modified Brain-Inspired Edge Detection and Object Recognition Algorithm (Funded by NASA)
Implemented modified algorithm of bio-inspired edge detection and object recognition (MATLAB).
- Jun 2013 – **Graduate Student Mentor, NASA CIPAIR PROGRAM, San Francisco State University.**
- Aug 2013 ○ Modeling and Implementation of Brain-Inspired Edge Detection Algorithm (Funded by NASA)
Model and implement the visual cortex in edge and angle recognition through the webcam live stream (C++).

Related Skills

Programming C, C++, MATLAB/Simulink, Python, Java, Assembly, PBASIC, Verilog, VHDL
IDE PyCharm, Eclipse, Microsoft Visual Studio, Spyder

Research Interests

- Cyber-Physical System/ Modeling and Simulation/ Embedded Systems Software Design Automation
- Predictive Control/ Autonomous Vehicles/ Model Compression/ Machine Learning

Teaching Experience

- Spring 2018, **Embedded Systems**, *Teaching Assistant*, ICS Department, *University of California Irvine*.
Spring 2016 ○ Assisted the students and professor in lab sessions with class projects and homework
Spring 2014 **Gateway to Computer Eng.**, *Teaching Assistant*, EECS Department, *San Francisco State University*.
○ Taught course materials including hands-on introduction to embedded computer systems using Boe-Bot robot

Selected Course Projects

- Machine Learning/Python **Rainfall Prediction**. Implemented a dynamic and general framework using machine learning techniques. Developed a model predictor for rainfall prediction application using real data and meta features. The project was implemented in Python using scikit-learn package and Spyder IDE. - Fall 2016
- Digital Design/Modelsim **Motion Estimator Standard Cell ASIC**. Implemented the design in Verilog and simulated and synthesized in Modelsim and Synopsys Design Compiler. - Fall 2013
- VLSI/Custom Designer **64 × 32 SRAM Block in 90nm CMOS Technology**. Dynamic decoder was used to reach minimum area and high performance. The project won the class design competition - Spring 2013
- Embedded Systems **Arduino-controlled Security System**. The system was viable for text communication with mobile devices and photo capture using camera - Spring 2013

Honors

- 2015-2019 **Four-Year ICS Dean's Full Fellowship Award**, *University of California Irvine*.
Spring 2018 **Scholarship to attend the TensorFlow Dev Summit 2018**, *Google*.
Spring 2015 **A. Richard Newton Young Student Fellow Award**, *Design Automation Conference (DAC)*.
Fall 2015 **Donald Bren School of ICS Grace Hopper Grant**, *University of California Irvine*.
Spring 2014 **Graduate Student Speaker at the School of Engineering's Commencement Ceremony**, *SFSU*.
Summer 2014 **Graduate Student Award for Distinguished Achievement**, *San Francisco State University*.

Selected Graduate Coursework

- Machine Learning
- Embedded Systems
- Image Understanding
- Intro to Artificial Intelligence
- Fundamental Algorithms
- Data Structures

Selected Publications

- 2018 **Maral Amir**, Tony Givargis, "Priority Neuron: A Resource-Aware Neural Network for Cyber-Physical Systems", *To appear as part of the ESWEEK-TCAD special issue*
- 2018 **Maral Amir**, Tony Givargis, "Switching Predictive Control Using Reconfigurable State-Based Model", *To appear on ACM Transactions on Design Automation of Electronic Systems (TODAES)*
- 2017 **Maral Amir**, Tony Givargis, "Hybrid State Machine Model for Fast Model Predictive Control: Application to Path Tracking", *International Conference On Computer Aided Design (ICCAD)*
- 2017 **Maral Amir**, Tony Givargis, "HES Machine: Harmonic Equivalent State Machine Model Generation Tool for Cyber Physical Systems", *International High-Level Design Validation and Test Workshop (IHLDVT)*
- 2015 **Maral Amir**, Steffen Peter, Tony Givargis, "Automated Heart Motion Tracking in Robotic Assisted Beating Heart Surgery", *Poster in Design Automation Conference (DAC)*
- 2015 Hamid Mahmoodi, **Maral Amir**, et al., "Teaching Brain-Inspired Visual Signal Processing via Undergraduate Research Experience", *American Society for Engineering Education, Pacific Southwest (ASEE PSW)*

Reference

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