

# CURRICULUM VITAE

## RICHARD O. EASON

University of Maine, Department of Electrical and Computer Engineering, Orono, ME 04469

### EDUCATION

- 1988 Ph.D., Electrical Engineering, University of Tennessee, Knoxville, Tennessee.  
*Determining the Pose of Three-dimensional Objects by Multi-sensor Fusion.* 4.0 GPA
- 1980 M.E., Electrical Engineering, University of Tennessee, Knoxville, Tennessee.  
*Development and Comparison of Algorithms for Generating a Scan Sequence for a Random Access Scanner.* 4.0 GPA
- 1978 B.S., Electrical Engineering, University of Tennessee, Knoxville, Tennessee. 3.86 GPA

### PROFESSIONAL EXPERIENCE

- 1988 – Present: Associate Professor, Electrical and Computer Engineering, University of Maine, Orono ME. Involved in teaching, research, and consulting. (Assistant Prof. from 1988-1994).
- 1982 – 1988: Graduate Research Assistant, Robotics and Integrated Manufacturing Laboratory, University of Tennessee, Knoxville, TN. Work included hardware and software design and implementation of a multi-sensing robotic gripper, research in robotic multiple sensor fusion, instructor for Logic Design course, and VLSI design of a symbol-matching processor.
- 1980 – 1982: VLSI Design Engineer, Zilog, Inc., Cupertino, CA. Logic and circuit design of integrated circuits for manufacture. Designed Zilog's Z8581 Clock Generator and Controller.
- 1979 – 1980: Graduate Research Assistant, Oak Ridge National Laboratory Instrumentation and Controls Division, Oak Ridge, TN. Work involved development and software implementation of an algorithm for generating the scan sequence for a random-access scanner.
- 1978 – 1979: Graduate Teaching Assistant, University of Tennessee, Knoxville, TN. Laboratory instructor for senior courses in microcomputers.
- 1977 – 1979: Research Assistant, Image and Pattern Analysis Laboratory, University of Tennessee, Knoxville, TN. Responsibilities included software work, image digitization, and microcomputer work.
- 1975 – 1977: Student Assistant, Mathematics Department, University of Tennessee, Knoxville, TN. Held positions of Tutor, Proctor, and Grader.

### RESEARCH AND OUTREACH

Recent work as focused on "High Altitude Ballooning" where students design and build payloads to be launched aboard a high-altitude balloon. The payloads are launched to altitudes of 110,000 feet or more and the payloads are then recovered. To date we have performed 114 high altitude balloon launches and have 100% success rate on payload recovery. More than half of these launches are with K-12 schools in the state with their students providing the experiments and the launch done at the schools. Prior to that I have participated in and directed the design and construction of several robots, including an autonomous mobile robot for the Autonomous Unmanned Vehicle competition and a very successful shoe trimming robot used in production since 1994 at Dexter Shoe Company and later Allen Edmonds Shoe Company. I was a Visiting Scholar at the University of Tennessee, Knoxville in summer 1990 working on multi-sensor data

fusion. I was an Invited Researcher at Kyushu Institute of Technology, Kitakyushu, Japan working in image data compression and also image steganography with nine research visits to Japan totaling more than one year. I performed research collaboration on a 3-D image display system at UCSI in Kuala Lumpur, Malaysia in summers of 2006 and 2007. I have considerable programming experience in many languages, most notably C and C++. I have been awarded seven US and five foreign patents.

## **TEACHING**

A substantial portion of my effort in recent years has been in teaching, mostly at the undergraduate level. I regularly teach two to three courses a semester. These include ECE 177 (Introduction to Programming for Engineers), ECE 198 (Scientific Ballooning), ECE 275 (Sequential Logic Systems), ECE 417 (Introduction to Robotics), and ECE 533 (Advanced Robotics). With the exception of ECE 198 and ECE 533, each of these courses has labs. My teaching workload is often a significant fraction of the department total. ECE 177 and ECE 275 are both required courses taken by all ECE first and second year students. The lab for ECE 177 in particular meets 3 hours a day, 4 days a week and I try to be in lab with the students as much as possible.

## **PROFESSIONAL AND HONORY MEMBERSHIPS**

Professional Engineer (Maine #10289), Senior Member IEEE, Mensa and Phi Kappa Phi, Tau Beta Pi, and Eta Kappa Nu honor societies.

## **PROPOSALS (Sole PI unless otherwise noted)**

\$20,000, UMaine High Altitude Ballooning and School Launches in Maine 2021-2022, 5/27/2021 (Awarded).

\$205,393, Nationwide Eclipse Ballooning Project 2022-2025, 4/12/2021 (Awarded).

\$167,343, Tracking Earth's Albedo with the EarthShine Cubesat, 12/15/2020 (Not awarded).

\$35,589, Nationwide Eclipse Ballooning Project 2021-2022, 1/01/2021 (Awarded).

\$748,682, Maine NASA EPSCoR Research Proposal: Long Endurance Low-Level Remote Sensing Missions Using Lighter Than Air Unmanned Aerial Vehicles, 3/07/2020 (Eason 10%, with Alex Friess, PI and others) (Not awarded).

\$10,000, NASA Robotics Mining Challenge Lunabotics 2020, 11/06/2019 (Awarded).

\$20,000, UMaine High Altitude Ballooning and School Launches in Maine 2019-2020, 9/3/2019 (Awarded).

\$10,000, NASA Robotics Mining Challenge 2019, 10/20/2018 (Awarded).

\$20,000, UMaine High Altitude Ballooning and School Launches in Maine 2018-2019, 7/19/2018 (Awarded).

\$5,000, Space Grant funding for NASA Robotics Mining Challenge, 2/20/2018 (Awarded).

\$20,000, UMaine High Altitude Ballooning and School Launches in Maine, 7/14/2017 (Awarded).

\$32,000, UMaine HAB Solar Eclipse Project, 3/15/2017 (Awarded).

\$18,000, UMaine High Altitude Ballooning Eclipse 2017 Preparation, 3/2/2016 (Awarded).

\$59,989, High Altitude Data Acquisition, Diagnostic, and Telemetry System (HiDAQ), UMaine portion of STTR submitted to Air Force with Midé Corporation, Inc, 2/17/2016 (Not awarded).

\$20,000, UMaine High Altitude Ballooning and School Launches in Maine for 2016, 2/16/2016 (Awarded).

\$200,000, Detection and Measurement of Airborne Microplastics, 11/18/2015 (Eason 90%, Brian Frederick 10%) (Not awarded).

\$20,000, UMaine High Altitude Ballooning and K-12 Launches, 2015, 2/11/2015 (Awarded).

\$6,000, High Altitude Balloon Launches for Students in K-12 Schools, 9/11/2014 (Awarded).

\$10,000, Student Course and Projects in High Altitude Ballooning at the University of Maine, 2014, 1/28/2014 (Awarded).

\$10,000, Student Course and Projects in High Altitude Ballooning at the University of Maine, 2013, 1/18/2013 (Awarded).

\$1,199,525, Strategies: Scientific Ballooning Platform for Project-Based Engineering and ICT Education, 11/12/2012. (Eason 10%, with Mohamad Musavi, PI and Ali Abedi, Yifeng Zhu, Karl Kreutz., and Ivan Fernandez) (Not Awarded).

\$6,000, High School High Altitude Balloon Launches for the 2012-2013 School Year, 10/17/2012 (Awarded).

\$1,500, Supplementary Funding for Student Course and Projects in High Altitude Ballooning at the University of Maine, 7/16/2012 (Awarded).

\$17,000, High School High Altitude Balloon Launches, Spring 2012, 3/23/2012 (Awarded).

\$10,000, Student Course and Projects in High Altitude Ballooning at the University of Maine, 11/9/2011 (Awarded).

\$12,000, Development of a High Altitude Scientific Ballooning Program at the University of Maine – Additional Funding, 4/20/2011 (Awarded).

\$12,000, Development of a High Altitude Scientific Ballooning Program at the University of Maine, 2/11/2011 (Awarded).

\$533,300, Advanced Biomechanics Laboratory for Injury Reduction and Rehabilitation, 5/27/2010, (Eason 15%, with Vincent Caccese, PI and Ashish Deshpande, Mohsen Shahinpoor, Elizabeth DePoy) (Awarded).

\$278,852, NSF-MRI: Acquisition of Equipment for Advanced Robotics Manipulation Platform, 4/21/2010, (Eason 5%, with Ashish Deshpande, PI, et al) (Not awarded).

\$1,499,822, Maine Center for Autonomous Marine Survey (MCAMS), 1/20/2009, (Eason 10%, with Neal Pettigrew, PI, and Roy Turner and Mary Jane Perry) (Awarded)

Was also the recipient of a \$28,019 curriculum fee award (Spring 2011) which has been applied mainly to improving the lab experience for students in the undergraduate robotics class.

## **PATENTS**

Seven US and various foreign patents including Apparatus and Process for Trimming the Sole of a Shoe (US 5,485,643), Display Apparatus Utilizing Persistence of Vision (US 5,748,157), Large Capacity Steganography (US 6,473,516), ID Card System using Steganography (US 6,742,712 and Europe EP1116176, WO00/19365, Japan 3,636,898), Index Color Steganography (US 6,697,498), Printed Image Steganography (US 6,978,035, Japan 3,535,444), Digital Certificate System and the Certificate Data (Japan 3,987,523), and Electronic Mailing System (US 7,231,049 and Japan 3,670,607).

## **OTHER RELATED ACHIEVEMENTS AND ACTIVITIES**

Serving on UMaine's Airplane Committee

Commercial Pilot, Certified Flight Instructor, Instrument (CFII), Airplane Single Engine Land, Private Pilot, Airplane Single Engine Sea, Instrument Airplane, and Part 107 Remote Pilot

Amateur Radio Operator, Extra Class License, AA1PJ. Volunteer Examiner and Liaison, and with help from a few colleagues, I administer Amateur Radio exam sessions for students and the general public several times a year.

Faculty advisor for the Blackbear Robotics Club, the UMaine Amateur Radio Club, University Flying Club, Skeptics Club, the Cube Society, and the Traditional Music and Dance Club.

## **PUBLICATIONS**

"Locating Payloads Using Doppler Shift in the Signal of a Backup CW Beacon," *Academic High Altitude Conference Proceedings 2019*, Ames, Iowa, June 2019 (with J. Patton).

"A Tutorial on BPCS Steganography and Its Applications," *Proceedings of Pacific Rim Workshop on Digital Steganography 2003*, pp. 18-31 (Invited Paper), Kitakyushu, Japan, July 2003.

"A Model of Anonymous Covert Mailing System Using Steganographic Scheme," *Information Modeling and Knowledge Bases XIV*, IOS Press, pp. 81-85, 2003, (with E. Kawaguchi, H. Noda and M. Niimi).

"High Capacity and Secure Digital Steganography with Palette-Based Images," *2002 IEEE International Conference on Image Processing*, pp. 917-920, September 22-25, 2002 (with M. Niimi, H. Noda, and E. Kawaguchi).

"A Method to Apply BPCS-Steganography to Palette-Based Images Using Luminance Quasi-Preserving Color Quantization," *Institute of Electronics, Information and Communication Engineering Transactions on Fundamentals of Electronics, Communications and Computer Sciences*, Vol. E85-A, No. 9, pp. 2141-2148, September 2002 (with M. Niimi, H. Noda, and E. Kawaguchi).

"Luminance Quasi-preserving Color Quantization for Digital Steganography to Palette-Based Images," *16<sup>th</sup> International Conference on Pattern Recognition*, August 11-15, 2002, (with M. Niimi, H. Noda, and E. Kawaguchi).

"Digital Steganography: A Perspective," *Proceedings of Pacific Rim Workshop on Digital Steganography 2002*, pp. 1-6 (paper for keynote speech), Kitakyushu, Japan, July 2002.