

David McPherson

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EDUCATION

University of California at Berkeley
Currently working toward a Ph.D. in EECS

Berkeley, CA
matriculated August 2015

University of Tennessee at Chattanooga
Bachelor of Science: Electrical Engineering, summa cum laude
Concentration: Robotics
Honors Thesis: Fuzzy Logic Control System for a Robotic Platform
GPA: 4.0

Chattanooga, TN
May 2015

PROFESSIONAL EXPERIENCE

Visiting Research Scholar, Institute of Mechanics and Ocean Engineering, Technical University of Hamburg-Harburg, Summer 2017

- Optimal exploration for submarine robotic platform
- Investigating effects of model misspecification and machine learning using stochastic optimal control

Graduate Researcher, Hybrid Systems Laboratory, University of California at Berkeley, January 2016 – December 2016

- Derived optimal controller for guaranteeing safety under probabilistic disturbances
- Mathematically modeling human behavior using economic/cognitive science principles of “noisy rationality”

Graduate Researcher, InterACT Laboratory, University of California at Berkeley

- Investigated legibility heuristics based on contrasting expressive trajectory examples
- Mathematically generalized legibility-based exaggeration to cost functionals and dynamic differential constraints

Graduate Researcher, Biomimetic Millisystems Laboratory, University of California at Berkeley, June 2015 – December 2015 & January 2017 – May 2017

- Researcher at Biomimetic Millisystems Laboratory
- Conducting research on cooperative righting behaviors and under-actuated mobile manipulation
- Team member for National Science Foundation project for Using Multi-Robot Enabled Dexterous Locomotion to Search for Victims in Disaster Areas

Undergraduate Research, University of Tennessee at Chattanooga, August 2014 – May 2015

- Conducted independent research on fuzzy controllers in robotics education
- Prepared and published research thesis at IEEE conference

Research Intern, University of Maryland REU, College Park, Maryland, Summer 2014

- Assembled miniature robotic platform with novel tail actuator

- Programmed functional nonlinear control system
- Wrote paper: *Precise Yaw Rotation and Stabilization Using Closed Loop Control of Inertial Tail Actuators*

UTC Robotics Team, IEEE Hardware Competition, 2013 – April 2015

- Organized navigation and locomotion subsystem as technical lead
- Designed line following algorithm
- Researched, designed, and assembled three locomotion prototypes
- Placed fourth in 2014 Southeast IEEE Hardware Competition
- Developed PID control system for locomotion
- Helped troubleshoot starting system

LEADERSHIP

Officer, Electrical Engineering Graduate Student Association, University of California
- Berkeley, August 2016 - Present

- Organized and re-constructed graduate student lounge
- Helped department in new graduate student orientations with expertise on advising
- Coordinated three yearly events
- Organized weekly events for CITRIS initiative robotics researchers that promoted collaboration and scientific community

President, Pi Mu Epsilon Mathematics Honors Society, University of Tennessee at
Chattanooga, Spring 2014 – May 2015

- Coordinated meetings
- Promoted interest in mathematics
- Organized Project Euler Tournament in cooperation with Computer Science Club

Vice President, IEEE Chapter, University of Tennessee at Chattanooga, Spring 2014 – May
2015

- Planned semester events for weekly meetings
- Taught seminars to promote interest in embedded systems
- Organized robot-building hack-a-thon

Vice President, Pi Mu Epsilon Mathematics Honors Society, University of Tennessee at
Chattanooga, Spring 2012 - Spring 2014

- Promoted involvement in society

Build Mentor, First Tech Challenge, Chattanooga, Tennessee, 2011-2012

Volunteer Referee, First Lego League, Chattanooga, Tennessee, 2013

HONORS AND AWARDS:

- 2015 Outstanding Senior Award: Electrical Engineering
- 2014 Lukens Award
- 2014 Mary Alice McBrayer Engineering Award
- 2013 James S. Kent Electrical Engineering Award

- 2012 John W. Jayne Memorial Mathematics Award
- 2012 Ryan Brackett Award for student with highest grade point average
- 2011 Mary Alice McBrayer Engineering Award
- Dean's List: all semesters
- Provost's Scholarship (Four Years) at the University of Tennessee at Chattanooga

MEMBERSHIPS

- **Institute of Electrical and Electronics Engineers**, 2012 - Present
- **Tau Beta Pi Engineering Honor Society**, 2013 - Present
- **Pi Mu Epsilon Mathematics Honors Society**, 2012 - Present

PUBLICATIONS

Pending: *Precise Yaw Rotation and Stabilization Using Closed Loop Control of Inertial Tail Actuators*

RELATED COURSEWORK

- Three-dimensional Modeling
- Calculus I, II and III
- Electrical Circuits I and II and laboratory
- Vector Statics
- Elementary Linear Algebra
- Engineering Programming
- Dynamics
- Differential Equations
- Principles of Physics: Electricity and Magnetism and laboratory
- Digital Electronics and laboratory
- Introduction to Engineering Design
- Principles of Physics: Optics and Modern Physics
- Signals and Systems
- Analog Electronics and laboratory
- Electromagnetic Fields and Waves
- Electrical Energy Conversion
- Electrical Machinery Laboratory
- Fluid Mechanics
- Introduction to Probability and Statistics
- Advanced Electronics and laboratory
- Modern Control Systems Analysis and Design
- Power Systems Analysis and Design
- Interdisciplinary Design
- Mathematical Statistics
- Microprocessors Applications
- Analog and Digital Communications
- Linear Controls and Drives Laboratory
- Departmental Thesis
- Artificial Neural Networks
- Techniques of Applied Mathematics

RESEARCH INTERESTS

Robotics

Intelligent Controls

Embedded Systems

Algorithms and Computer Science

Computer Simulation