

# Patrick J. Martin

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## Education

**Ph.D. Electrical and Computer Engineering** May 2010  
[Georgia Institute of Technology](#), Atlanta, Georgia

- THESIS: *Motion Description Languages: From Specification to Execution*
- ADVISOR: Magnus Egerstedt
- HONORS: Eta Kappa Nu

**M.S. Electrical Engineering** May 2004  
[University of Maryland](#), College Park, Maryland

- ADVISOR: P.S. Krishnaprasad

**B.S. Physics and Applied Mathematics** May 2002  
[Hampden-Sydney College](#), Hampden-Sydney, Virginia

- HONORS: *Summa Cum Laude*, Phi Beta Kappa, Omicron Delta Kappa

## Research Experience

**Assistant Professor** August 2010 to Present  
York College of Pennsylvania  
[Electrical and Computer Engineering Program](#)

- Managed NSF funded research program in cyber-physical systems.
- Developed software architecture for cloud-computing on cyber-physical systems.

**Graduate Research Assistant** January 2007 to July 2010  
Georgia Institute of Technology  
[Georgia Robotics and Intelligent Systems Lab](#)

- Created algorithms and software for compiling motion-description languages.
- Applied research results to robotic puppets and unmanned ground vehicles.

**Research Engineer** July 2004 to July 2006  
[Intelligent Automation, Inc.](#)  
Distributed Intelligent Systems Group

- Managed ARO funded research program in multi-agent robotics.
- Designed and implemented multi-agent algorithms for boundary tracking tasks.

## Teaching Experience

### Assistant Professor

Fall 2010 to Present

York College of Pennsylvania

ECE235: Discrete Mathematics

ECE280: Fundamentals of EE

ECE370: Microprocessor System Design

ECE400/402: Capstone Design

EGR100: Engineering Practice and Design I

EGR442: Applied Control

PHY260: Engineering Physics - E&M

### Assistant Lecturer

Spring 2008 to Spring 2009

Georgia Institute of Technology

ECE4823: Game Theory and Multiagent Systems

ECE3085: Introduction to Systems and Controls

ECE4555: Embedded and Hybrid Control Systems

### Graduate Teaching Assistant

Fall 2006

Georgia Institute of Technology

ECE3041/3042: Instrumentation and Circuits Lab I/II

## Grants Awarded

Hybrid Control Tools for Power Management and Optimization in Cyber-Physical Systems, National Science Foundation, 2012-2015.

## Publications

### Journal Articles

P. Twu, P. Martin, M. Egerstedt. Graph Process Specifications for Hybrid Networked Systems. *Journal of Discrete Event Dynamic Systems: Theory and Applications*, Vol. 22, No. 4, pp. 541-577, 2012.

P. Martin and M. Egerstedt. Hybrid Systems Tools for Compiling Controllers for Cyber-Physical Systems. *Journal of Discrete Event Dynamic Systems: Theory and Applications*, Vol. 22, No. 1, pp. 101-119, 2012.

P. Martin, E. Johnson, T. Murphey, and Magnus Egerstedt. Constructing and Implementing Motion Programs for Robotic Marionettes. *IEEE Transactions on Automatic Control*, Vol. 56, No. 4, pp. 902-907, 2011.

P. Martin and M. Egerstedt. Timing Control of Switched Systems with Applications to Robotic Marionettes. *Journal of Discrete Event Dynamic Systems: Theory and Applications*, Vol. 20, No. 2, 2010.

P. Martin and M. Egerstedt. Motion Description Language-Based Topological Maps for Robot Navigation. *Communications in Information and Systems*, Vol. 8, No. 2, pp. 171 - 184, 2009.

## Book Chapters

P. Martin, J.P. de la Croix, and M. Egerstedt. Pancakes: A Software Framework for Distributed Robot and Sensor Network Applications. In *Distributed Autonomous Robotic Systems: 10th International Symposium*, pp. 115-127, 2013.

P. Martin and M. Egerstedt. Optimization of Multi-Agent Motion Programs with Applications to Robotic Marionettes. *Hybrid Systems: Computation and Control*, Springer-Verlag, San Francisco, USA, April 2009.

## Conference Proceedings

P. Glotfelter, T. Eichelberger, and P. Martin. PhysiCloud: A Cloud-Computing Framework for Programming Cyber-Physical Systems. *To appear Multi-Conference on Systems and Control*, 2014.

P. Martin. An Interdisciplinary Controls Curriculum for Cyber-Physical Systems Education. *1<sup>st</sup> Workshop on Cyber-physical Systems Education*, April, 2013.

P. Twu, P. Martin, and M. Egerstedt. Graph Process Specifications for Hybrid Networked Systems. *Workshop on Discrete Event Systems*, Berlin, Germany, August 2010.

P. Martin, R. Galvan-Guerra, and M. Egerstedt. Power-Aware Sensor Coverage: An Optimal Control Approach. *19<sup>th</sup> International Symposium on Mathematical Theory of Networks and Systems*, July, 2010.

P. Martin and M. Egerstedt. On the Specification and Execution of Motion Programs for Networked Systems. *19<sup>th</sup> International Symposium on Mathematical Theory of Networks and Systems*, July 2010.

P. Martin and M. Egerstedt. Expanding Motion Programs Under Input Constraints. *American Control Conference*, pp. 2416-2421, June 2010.

P. Martin, J.P. de la Croix, and M. Egerstedt. MDLn: A Motion Description Language for Networked Systems. *Proceedings of the 47th IEEE Conference on Decision and Control*, pp. 558-563, December 2008.

P. Martin and M. Egerstedt. Optimal Timing Control of Interconnected, Switched Systems with Applications to Robotic Marionettes. *Workshop on Discrete Event Systems*, Gothenburg, Sweden, May 2008.

## Honors and Awards

- President's Fellowship, Georgia Institute of Technology, 2006 to 2010
- Patrick Henry Scholar, Hampden-Sydney College, 1998 to 2002
- Eagle Scout

## Professional Activities

- Member, [3rd International DSLRob Workshop Program Committee](#), September 2012.
- Member, [2nd International DSLRob Workshop Program Committee](#), September 2011.
- Chair, [Georgia Tech DCL Student Symposium Committee](#), Spring 2010
- Member, [Georgia Tech DCL Student Symposium Committee](#), Spring 2009

### Workshops attended:

- [1<sup>st</sup> Workshop on Cyber-Physical Systems Education](#), CPS Week, 2013.
- [Cyber-Physical Systems Summer School](#), Georgia Institute of Technology, 2011.
- [How to Engineer Engineering Education \(E<sup>3</sup>\) Workshop](#), Bucknell University, 2009

### Referee for:

- IEEE Conference on Decision and Control
- IEEE American Control Conference
- IEEE Multi-Conference on Systems and Control
- IEEE International Conference on Robotics and Automation
- IEEE Transactions on Automation Science and Engineering

### Society memberships:

- Institute for Electrical and Electronic Engineers (IEEE)
- American Society of Engineering Education (ASEE)

## Service and Leadership

- Member, Middle States Steering Committee, York College of Pennsylvania, 2013 to 2014.
- Member, Academic Programs Committee, York College of Pennsylvania, 2011 to 2014.
- President, Alpha Chi Sigma Alumni Association, Hampden-Sydney College, 2013 to Present
- Graduate, Society of '91 Leadership Program, Hampden-Sydney College, 1999