Jeffrey R. Peters ***Curriculum vitae***

CONTACT INFORMATION

United Technologies Research Center
Systems Department
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East Hartford, CT 06119 USA

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RESEARCH INTERESTS

Human supervisory control, human-centered systems, robotic coordination and motion planning, autonomous systems, distributed systems and control, estimation and non-linear optimization , distributed algorithms and computation, and applied mathematics.

EDUCATION

University of California, Santa Barbara, Santa Barbara, CA

Ph.D., Mechanical Engineering *June 2017*

- Dissertation Title: *Coordination Strategies for Human Supervisory Control of Robotic Teams*
- Adviser: Professor Francesco Bullo
- Area of Study: Control Engineering

M.A., Applied Mathematics *December 2015*

- Area of Study: Real and Complex Analysis, Numerical Analysis

M.S., Mechanical Engineering *December 2013*

- Thesis Title: *Camera Coordination for Smart Intruder Detection*
- Adviser: Professor Francesco Bullo
- Area of Study: Control Engineering

University of Illinois, Urbana-Champaign, IL

B.S., Mechanical Engineering *May 2011*

- Bronze Tablet Honors
- Minor in Mathematics

PROFESSIONAL EXPERIENCE

United Technologies Research Center, East Hartford, CT

Senior Research Engineer, Robotics AI Expert *Summer 2017 - Present*

- Department: Systems
- Group: Decision Support and Machine Intelligence
- Group Leader: Tong Sun
- Performed fundamental robotics research

University of California, Santa Barbara, Santa Barbara, CA

Graduate Student Researcher *Summer 2011- Spring 2017*

- Advisor Francesco Bullo
- Performed fundamental robotics research
- Developed coordination schemes for mobile sensors
- Implemented novel supervisory control algorithms

United Technologies Research Center, East Hartford, CT

Systems Department Consultant *Summer 2014, Summer 2015*

- Supervisors: Amit Surana, Luca Bertuccelli
- Designed supervisory control schemes
- Analyzed eye-tracking data

John Deere Construction and Forestry Division, Davenport, IA

Quality Engineering Intern *Summer 2010*

- Supervisors: Ellen Huntley, Amanda Freese
- Implemented new quality monitoring software

John Deere, Agriculture Division, Waterloo, IA

Manufacturing Engineering Intern *Summer 2009*

- Supervisor: Michael Walker
- Identified root causes of assembly issues
- Developed new automated oil system

PUBLICATIONS

Journal Articles

[1] J. R. Peters, A. Surana, G. Taylor, T. Turpin, and F. Bulo. UAV Surveillance Under Visibility and Dwell-Time Constraints. *ASME Journal of Dynamic Systems, Measurement, and Control*, 2017. Submitted.

[2] J. R. Peters, A. Surana, and F. Bullo. Robust Scheduling and Routing for Collaborative Human-UAV Surveillance Missions. *AIAA Journal of Aerospace Information Systems*, 2017. Submitted.

[3] J. R. Peters, S. Wang, A. Surana, and F. Bulo. Cloud-Supported Coverage Control for Persistent Surveillance Missions. *ASME Journal of Dynamic Systems, Measurement, and Control*, 2016.

[4] J. R. Peters and L. Bertuccelli. Robust Task Scheduling for Multi-Operator Supervisory Control Missions. *AIAA Journal of Aerospace Information Systems*, 2016.

[5] J. R. Peters, D. Borra, B. E. Paden, and F. Bullo. Sensor Network Localization on the Group of 3D Displacements. *SIAM Journal on Control and Optimization*, 2015.

[6] J. R. Peters, V. Srivastava, G.S. Taylor, A. Surana, M.P. Eckstein, and F. Bullo. Human Supervisory Control of Robotic Teams: Integrating Cognitive Modeling with Engineering Design. *IEEE Control Systems Magazine*, 2015.

[7] F. Pasqualetti, F. Zanella, J.R. Peters, M. Spindler, R. Carli, and F. Bullo. Camera Network Coordination for Intruder Detection. *IEEE Transactions on Control Systems Technology*, 2013.

Conference Articles

[1] J. R. Peters, S. Wang, A. Surana, and F. Bullo. Coverage Control with Anytime Updates for Persistent Surveillance Missions. *American Control Conference*, 2017.

[2] A. Deza, J. R. Peters, A. Surana, G.S. Taylor, and M. Eckstein. Attention Allocation Aid for Visual Search. *ACM CHI*, 2017.

[3] J. R. Peters and L. Bertuccelli. Robust Scheduling Strategies for Collaborative Human-UAV Missions. *American Control Conference*, 2016.

Books/Teaching Curriculum

[1] J. R. Peters and R. Patel. Thinking Robotics: Teaching Robots to Make Decisions. http://www.teachengineering.org/. 2015.

Software

[1] J. R. Peters and Contributors. The AreaCon Library. *www.areacon.org*, 2016.

Miscellaneous

[1] J. R Peters. Coordination Strategies for Human Supervisory Control of Robotic Teams. PhD Dissertation, Mechanical Engineering Department, University of California at Santa Barbara, June 2017.

[2] J. R. Peters, L. Bertuccelli, and A. Surana. Eye-Tracking Metrics for Task-Based Supervisory Control. *arXiv preprint, arXiv:1506.01976*, 2015.

[3] J.R. Peters. Camera Coordination for Intruder Detection in 1D Environments. MS Thesis, Mechanical Engineering Department, University of California at Santa Barbara, December 2013.

Referee Service

Journals

- *ASME Journal of Dynamic Systems, Measurement, and Control*
- *IEEE Transactions on Human-Machine Systems*
- *IEEE Transactions on Control Systems Technology*
- *IEEE Transactions on Control of Network Systems*
- *South African Computer Journal*
- *Automatica*

Conferences

- *IFAC World Congress*
- *American Control Conference*

Student Advising

Graduate Students

Franklin Zheng — *June 2016- June 2017*

- Mechanical Engineering Department, UCSB.
- Project Title: *UAV Planning Strategies for Environmental Monitoring*

Undergraduate Students

Viswa Rao, Landon Peik, Sean Wang, Jake Carrade, and Alan Cao — *September 2016 - June 2017*

- Mechanical Engineering Department, UCSB.
- ME Capstone Design Team
- Project Title: *UAV Strategies for Automated Bird Detection*

Sean J. Wang — *January 2016 - June 2017*

- Mechanical Engineering Department, UCSB.
- Project Title: *Multi-Agent Surveillance of Dynamic Environments Under Sporadic Communication Protocols.*
- Recipient of the Tirrell Award for Distinction in Undergraduate Research

Tirion Wray — *April 2016-June 2016*

- Mechanical Engineering Department, UCSB.
- Project Title: *Anytime Algorithms for Multi-Agent Surveillance of Dynamic Environments.*

Ariana Del Toro — *June 2013-August 2013*

- Mechanical Engineering Department, San Francisco University.
- RISE (Research Internships in Science and Engineering) Intern.
- Project Title: *Robotic Coverage Control: Theory and Implementation*

High School Students

Heather Vermilyea *June 2013-October 2013*

- Dos Pueblos High School, Goleta, CA.
- Project Title: *Revisions and preparation for School for Scientific Thought class entitled "Thinking Robotics: Teaching Robots to Make Decisions."*

TEACHING EXPERIENCE

University of California, Santa Barbara, Santa Barbara, CA

Lecturer/Teaching Associate

- *ME 179P: Intro to Robotic Planning and Kinematics* *Spring 2017*
- *ME 16: Dynamics* *Summer 2016*

Teaching Assistant

- *ME 179P: Intro to Robotics: Planning and Kinematics* *Spring 2016*
- *ME 104: Mechatronics* *Fall 2015, Fall 2011*
- *ME 16: Dynamics* *Spring 2014*

University of Illinois Urbana-Champaign, IL

Grader

- *TAM 210: Statics* *Spring 2011*

Engineering Learning Assistant

- *Eng 100: Intro to Engineering* *Fall 2010*

OUTREACH

School for Scientific Thought

Instructor *Winter and Fall 2013*

- Taught a class to high school students entitled "Thinking Robotic: Teaching Robots to Make Decisions" in which students build a small robot and learn to program it to perform tasks such as simple navigation and object detection.
- Curriculum written for this class is published on www.teachengineering.org

UNDERGRADUATE RESEARCH

University of Illinois Urbana-Champaign, IL

Effect of Controllers on Bistability in Atomic Force Microscopes *Fall 2010-Spring 2011*

- Advisor: Srinivasa Salapaka.

Absorption of Solar Cells Containing InAS/GaAs Quantum Dots Based on Intermediate Band Placement *Spring 2010*

- Advisor: Harley Johnson.

PROFESSIONAL MEMBERSHIPS

Institute for Electrical and Electronics Engineers (IEEE) *2011–present*

- *IEEE Control Systems Society* *2011–present*

AWARDS AND DISTINCTIONS

University of California, Santa Barbara, Santa Barbara, CA

- *Certificate in College and University Teaching* *2016*
- *Winner of UCSB Mechanical Engineering Grad Slam* *2016*
- *CCDC Outstanding Scholar Fellowship* *2011*

University of Illinois Urbana-Champaign, IL

- *Engineer in Training (EIT)* *2011 - Present*
- *Bronze Tablet Distinction for Graduation with Highest Honors* *2011*
- *Earl and Althea Smith Scholarship* *2010*
- *Pi Tau Sigma Honor Society Initiate Award* *2008*
- *Dean's List, 7 Semesters* *2007-2011*

SOFTWARE SKILLS

Instrumentation, Control, Data Acquisition, Test, and Measurement:

- *Simulink*
- *LabVIEW*

Computer Programming:

- *C++*
- *Matlab*
- *Python*

Numerical Analysis:

- *Matlab*

EXPERTISE

Mathematics:

- Applied Mathematics, Linear Algebra, Real Analysis, Topology, Differential Geometry, Graph Theory.

Control Theory and Engineering:

- Human supervisory control, Robotic coordination, Linear and Nonlinear Systems Theory, Feedback, Distributed Algorithms.

Communications and Signal Processing:

- Probability, Random Variables, Estimation and Filtering

Computer Science and Engineering:

- Convex and Nonconvex Optimization, Optimization on Manifolds, Numerical Algorithms for ODEs and PDEs

Psychology and Human Factors:

- Human-centered Systems, Accumulator Models for Perceptual Decision Making, Exogenous Factors, Decision Support Systems and Attention Allocation Aids, User Interface Design

REFERENCES AVAILABLE TO CONTACT

Available upon request.