Curriculum Vitae

Ella M. Atkins

Professor, Aerospace Engineering
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a. Resume

a.1 Education

Ph.D., 1999, University of Michigan, Computer Science & Engineering
Dissertation Title: *Plan Generation and Hard Real-time Execution with Application to Safe, Autonomous Flight*
Dissertation Advisors: Kang G. Shin and Edmund H. Durfee
M.S., 1995, University of Michigan, Computer Science & Engineering
M.S., 1990, Massachusetts Institute of Technology (MIT), Aeronautics & Astronautics
B.S., 1988, Massachusetts Institute of Technology (MIT), Aeronautics & Astronautics
Part 107 (UAS) Remote Pilot, 2016, Ann Arbor, MI
Private Pilot (Airplane Single Engine Land), 1993, CFI: Cindy Rice, San Diego, CA

a.2 Positions at the University of Michigan (titles and dates)

Professor, Aerospace Engineering Department, 2016 - present
Associate Professor, Aerospace Engineering Department, 2006 - 2016
Courtesy Appointment, Computer Science and Engineering, 2007 - present
Graduate Student Fellow and Research Assistant, 1993 – 1999

a.3 Positions at other institutions or organizations (titles and dates)

Assistant Professor, Aerospace Engineering Department (University of Maryland), 1999 – 2006 (awarded tenure in 2006)
Project Engineer, Structural Dynamics Research Corporation, 1990 – 1993
Graduate Student Research Assistant, MIT, 1988 –1990
Engineering Intern, Aerospace Corporation, Summers 1986 & 1987

a.4 Honors and Awards

- Trudy Huebner Service Excellence Award, University of Michigan, 2013.
- Aerospace Engineering Department Award, University of Michigan, 2009.
- NSF CAREER Award, 2004-2009.
- Associate Fellow, American Institute of Aeronautics & Astronautics (AIAA).
- Aerospace Engineering Dept. Faculty Mentor Award, Univ. of Maryland, 2004.
- Sloan Foundation Pre-Tenure Leave Fellowship, 2002-2003.
- GE Pre-Doctoral Fellowship, University of Michigan, 1997-1998.
- Orenstein Fellowship, EECS Department, University of Michigan, 1993-1994.
- Sigma Gamma Tau Aerospace Engineering Honor Society, inducted 1987.
- Tau Beta Pi Engineering Honor Society, inducted 1986.
- America's Junior Miss Scholastic Achievement Award, 1984.
- National Merit Scholar, 1984.

b. Teaching

b.1 New courses introduced at the University of Michigan (2006 – present):

- **AERO 450: Flight Software Systems:** This course introduces fundamental computing theory and modern programming practice that enable robust design, implementation, and testing of modern flight software systems. Lectures follow parallel theory and practice tracks. Topics in computational theory include discrete mathematics, finite automata, computational complexity, and model checking. Equally-emphasized, software engineering topics include object-oriented programming, network and multi-threaded software, embedded system programming, and model-based design.

- **ENGR 151: Accelerated Introduction to Computers and Programming:** This course is an accelerated version of the "freshman programming" introductory course ENGR 101 appropriate for students with some background and a strong interest in programming. Students are introduced to the algorithm development and procedural programming concepts covered in Engineering 101 but at a faster pace. Engineering 151 also introduces object-oriented programming, engineering analysis methods, and additional topics such as parallel computing and embedded systems.

- **AERO 552: Aerospace Information Systems:** This course introduces the fundamental representations and inference methods from which Aerospace information systems are designed and implemented. The course is organized in four primary topic areas: (1) Symbolic systems including data structures and algorithms, automata theory, and logic-based inference, (2) Graph search and planning/optimization, (3) Information theory, and (4) Integrated planning and control. Automata theory provides a language to describe a platform's possible discrete states and associated dynamics.

- **ROB 550: Robotic Systems Laboratory:** Robotics 550 is a multidisciplinary laboratory course for graduate students with exposures to sensing, reasoning, and acting for physically-embodied systems. Manipulator and rigid-body mobile robot kinematics, sensor-based localization and mapping, motion planning, feedback control, and human-robot interaction. ROB 550 centers around three lab projects: (1) a fixed-base pick-and-place serial manipulator for pick-and-place tasks, (2) a delta-arm flown on a quadrotor, and (3) a two-wheel mobile robot that balances itself. Students are asked to design end effectors and achieve autonomous operation of all systems.

New courses introduced at the University of Maryland (1999-2006):

- **ENAE 202: Introduction to Programming Languages**
- **ENAE 380: Flight Software Systems**
- **AERO 488E: Embedded Real-Time Systems**
- **AERO 788I: Intelligent Automation of Aerospace Systems**

b.2 Courses taught at the University of Michigan (last 7 years):

- **AERO 552 (Aerospace Information Systems)**
- **AERO 450 (Flight Software Systems)**
- **ROB 550 (Robotic Systems Laboratory)**
- **AERO 201 (Introduction to Aerospace Engineering)**
- **AERO 245 (Performance of Aircraft and Spacecraft)**
- **ENGR 101 (Intro to Computers & Programming)**
- **ENGR 151 (Accelerated Intro to Computers & Programming)**

b.3 Ph.D. Committees chaired/co-chaired

1. **Jeremy Castagno,** 2021 (expected), Chair (Robotics Program PhD Pre-Candidate).
2. **Cosme Ochoa,** 2020 (expected), "UAS Trajectory Prediction and Anomaly Management," Chair (Robotics Program PhD Pre-Candidate).
3. **Yu (Brian) Yao,** 2020 (expected), "A Smart Black Box for Automotive Diagnostics," Chair (Robotics Program PhD Pre-Candidate).
4. **Mia Stevens,** 2019 (expected), "Safe Low-Altitude Small UAS Flight via Certifiable Geofencing," Chair (Robotics Program PhD Candidate).
5. **Pedro di Donato,** 2017 (expected), "Aircraft Emergency Landing Planning with Real-time Sensor-Database Information Fusion," Chair (Aerospace Engineering PhD Candidate).
6. **Sweewarman Balachandran,** 2016, "Flight Safety Assessment and Management," Chair (Current Position: Research Scientist, NASA Langley / NIA).
7. **Zhaojian Li,** 2016, "Cloud-Aided Decision Aids for Automotive Applications," Co-Chair (Current Position: Research Engineer, General Motors Company; New Position (starting Sep. 2017): Assistant Professor, Michigan State University).
8. **John Broderick,** 2015, "Energy and Mobility Management of a Ground Robot to Increase Operational Capacity," Co-Chair (Current Position: Project Engineer, Ford Motor Company).
9. **Justin Bradley,** 2014, "Toward Co-Design of Autonomous Aerospace Cyber-Physical Systems," Chair (Current Position: Assistant Professor, Computer Science and Engineering, University of Nebraska-Lincoln).
10. **Justin Rufa,** 2014, "Location-Based Sensor Fusion for UAS Urban Navigation," Chair (Current Position: Major, United States Air Force).
11. **Heejun Choi,** 2014, "Time-Optimal Paths for a Dubins Car and Dubins Airplane with a Unidirectional Turning Constraint," Chair (Current Position: unknown).
12. **Catharine McGhan,** 2014, "Safe and Efficient Robot Action Choices Using Human Intent Prediction in Physically-Shared Space Environments," Chair (Current Position: Assistant Professor, Aerospace Engineering, University of Cincinnati).
13. **Derrick Yeo,** 2013, "Aerodynamic Sensing for Autonomous Unmanned Aircraft Systems", Chair (Current Position: Assistant Research Scientist, Univ. of Maryland).
14. **Johnhenri Richardson,** 2013, "Quantifying and Scaling Airplane Performance in Turbulence," Co-Chair (Current Position: Northrop Grumman Corporation).
15. **Ali Nasir,** 2012, "Comprehensive Fault Tolerance and Science-Optimal Attitude Planning for Spacecraft Applications", Co-Chair (Current Position: Assistant Professor, University of Central Punjab, Pakistan).
16. **Ryan Eubank,** 2012, "Autonomous Flight, Fault, and Energy Management of the Flying Fish Solar-Powered Seaplane," Chair (Current Position: Research Engineer, MIT Lincoln Laboratory).
17. **Min Xue,** 2006 (University of Maryland), "Real-Time Terminal Area Trajectory Planning for Runway Independent Aircraft", Chair (Current Position: Research Scientist, NASA Ames Research Center).
18. **Jamie Lennon,** 2006 (University of Maryland), "An Architecture for the Autonomous Generation of Preference-Optimized Trajectories", Chair (Current Position: Group Lead, Project Engineer, Naval Research Laboratory (NRL)).

c. Research

c.1 Past grants and contracts

1. *National Aeronautics and Space Administration (NASA),* "Envelope-Guided Flight Management for Loss of Control Prediction, Prevention, and Recovery," $750,000, Sept. 2012 – Aug. 2016, PI: Ella Atkins, Co-PIs: Dennis Bernstein, Ilya Kolmanovsky.

2. *National Institute of Aerospace (NIA),* "Development of a Variable Autonomy sUAS for NAS Integration," $20,000 (University of Michigan support for larger NASA Langley project), Nov. 2015 – Mar. 2016, PI: Ella Atkins.

3. *Ford Motor Company*, "System Architecture and Algorithms for Vehicle to Cloud to Vehicle Control System (V2C2V)," $180,000, Mar. 2013 – Dec. 2015, PI: Ilya Kolmanovsky, Co-PI: Ella Atkins.

4. *US Army TARDEC, Automotive Research Center (ARC),* "Reconfigurable Control for Failure Prevention and Recovery," $155,000, Jan. 2012 - Dec. 2014, PI: Dawn Tilbury, Co-PI: Ella Atkins.

5. *National Science Foundation (NSF),* "CPS: Medium: Collaborative Research: Abstraction of Cyber-physical Interplays," $1,500,000 ($825,000 U. Michigan), Oct. 2009 – Sep. 2013, PI: Kang Shin, Co-PIs: Mani Krishna (U. Mass PI), Ella Atkins, Israel Koren.

6. *MIT Lincoln Laboratory*, "Solar UAS Development at the University of Michigan (Phase I and II)," $450,000, Sep. 2010 - Aug. 2012, PI: Ella Atkins.

7. *Boeing*, "Task 5: System Identification and Control of a Flexible Long-Endurance Aircraft," (Added to a major grant with PI Anthony Waas, Nov. 2010 - Nov.2012, Task Lead: Ella Atkins.

8. *National Aeronautics and Space Administration (NASA),* "Integration of Advanced Concepts and Vehicles into the Next Generation Air Transportation System," $90,000 (subcontract from Raytheon), Aug. 2008 - Dec. 2009, U. Michigan PI: Ella Atkins.

9. *Defense Advanced Research Projects Agency (DARPA),* "Flying Fish Station Keeping Ocean Buoy Persistent Ocean Surveillance Program (Phase II)," $596,480, Feb. 2008 - Aug. 2009, PI: Guy Meadows, Co-PIs: Ella Atkins, Pete Washabaugh, Luis Bernal, Brian Gilchrist.

10. *National Aeronautics and Space Administration (NASA),* "A Damage-Resilient Flight Planning and Guidance System for Safe, Collaborative Emergency Management," $750,000, Nov. 2007 - Nov. 2011, PI: Ella Atkins, Co-PI (U. Maryland): Rob Sanner.

11. *Defense Advanced Research Projects Agency (DARPA),* "Flying Fish Station Keeping Ocean Buoy Persistent Ocean Surveillance Program (Phase I)," $500,000, Feb. 2007 - Jan. 2008, PI: Guy Meadows, Co-PIs: Wei Shyy, Ella Atkins, Pete Washabaugh, Luis Bernal, Brian Gilchrist.

12. *National Aeronautics and Space Administration (NASA) JPL,* "Autonomous Goal-based Motion Planning for the Mission Data System," $50,000, May 2007 - Apr 2008, PI: Matthew Bennett (NASA JPL), Co-PI: Ella Atkins (University of Michigan), NASA JPL Strategic University Research Partnership (SURP) program.

13. *National Science Foundation (NSF),* "Science of Design (SoD): Reducing the Cost of Developing Safe and Secure Networked Avionics Systems," $300,000, Sep. 2006 – Aug. 2008, Overall PI: Tarek Abdelzaher (UIUC), Institution PIs: Ella Atkins (UMich), Al Mok (UT Austin), Fei Xie (Portland State).

14. *National Science Foundation (NSF),* "Navigation, Actuation, and Mission Management for a Free-Flying Space Simulation Robot," Research Internships in Science and Engineering (RISE) program, June-August 2005, PI: Linda Schmidt, Co-I: Ella Atkins.

15. *Maryland Industrial Partnerships Program (with small business Neany, Inc.),* "Low-Cost Reconfigurable Autopilot and Composite Wing Technologies for an Expendable UAV – Phase II," $100,000, Feb. 2005 – Jan. 2006, PI: Ella Atkins, Co-PI: Norm Wereley.

16. *National Science Foundation (NSF),* "REU Supplement to CAREER Project," $12,500, Aug. 2004 - Feb. 2005, PI: Ella Atkins.

17. *DoD Micro Air Vehicle Multi-disciplinary University Research Initiative (MURI),* "Scale-Free Mission Specification and Guidance for MAV Swarms," $300,000 (budget for Atkins task), June 2004 – May 2009 (terminated upon my departure from the University of Maryland – August 2006), MURI PI: Inderjit Chopra, TASK PI: Ella Atkins.

18. *National Institute of Aerospace (NASA),* "Sensor Evaluation for an Unmanned Aerial Vehicle (Rising Star Fellowship)," $84,000, May 2004 – May 2006, PI: Ella Atkins.

19. *National Science Foundation (NSF),* "CAREER: State-dependent Resource Management for Integrated Task and Motion Plans," $421,000, Feb. 2004 – Jan. 2009, PI: Ella Atkins.

20. *Maryland Industrial Partnerships Program (with small business Neany, Inc.),* "Low-Cost Reconfigurable Autopilot and Composite Wing Technologies for an Expendable UAV – Phase I," $100,000, Feb. 2004 – Jan. 2005, PI: Ella Atkins, Co-PI: Norm Wereley.

21. *National Aeronautics and Space Administration (NASA),* "Technology Development for Autonomous Sampling and Return Missions," $3,000,000 (WHOI: $1.5M –PI: Hanu Singh, University of Maryland: $1,5M), Jan. 2004 – Dec. 2006, U. Maryland PI: David Akin, U. Maryland Co-PIs: Ella Atkins and Craig Carignan.

22. *National Aeronautics and Space Administration (NASA),* E. Atkins, "Efficient Optimization of Satellite Formations," $180,000, Nov. 2003 – Oct. 2006, PI: Ella Atkins.

23. *National Aeronautics and Space Administration (NASA),* "TableSat Satellite Simulation Platform," $15,000, Nov. 2003 – Mar. 2004, Co-PIs: Ella Atkins and Rob Sanner.

24. *National Aeronautics and Space Administration (NASA),* "Adaptive Flight Planning for the Pilot's Optimal Workload Reducer (POWR)," $300,000, Oct. 2003 – Sep. 2006, PI: E. Atkins, Co-PI: Rob Sanner.

25. *Maryland Industrial Partnerships Program (with small business NAVMAR Corp.),* "Autonomous Aircraft for Video Surveillance (Phase II)," $150,000, Jan. 2002 – Dec. 2002, PI: Darryll Pines, Co-PIs: Ella Atkins and Norm Wereley.

26. *National Aeronautics and Space Administration (NASA),* "Optimal Planning and Control of a Virtual Rigid Body Satellite Constellation," $82,630, Oct. 2001 – Sep. 2002, Co-PIs: Ella Atkins and Rob Sanner.

27. *Scientific Applications International Corporation (SAIC),* "Attitude Control Algorithms for Orbital Express Docked Servicing Missions," $37,000, May 2001 – Oct. 2001, PI: Rob Sanner, Co-PI: Ella Atkins.

28. *National Aeronautics and Space Administration (NASA) Rotorcraft COE,* "Airspace Integration and Flight Path Management to Maximize Throughput and Minimize Noise Exposure Surrounding Vertiports," $348,000, Jan. 2001 – Dec. 2005, Co-PIs: Ella Atkins and Fredric Schmitz (COE PI: Inderjit Chopra).

29. *Maryland Industrial Partnerships Program (with small business NAVMAR Corp.),* "Autonomous Aircraft for Video Surveillance," $150,000, Jan. 2001 - Dec. 2001, PI: Norm Wereley, Co-PIs: Ella Atkins, Darryll Pines.

30. *National Aeronautics and Space Administration (NASA),* "Precise Virtual Rigid Body Control of a Satellite Constellation," $70,000, Oct. 2000 – Sep. 2001, Co-PIs: Ella Atkins and Rob Sanner.

31. *NAVMAR Corporation,* "Low Cost UAV for Surveillance and Targeting (LOCUST)," $253,000, Aug. 2000 – July 2001, PI: Darryll Pines, Co-PIs: Ella Atkins, Norm Wereley.

c.2 Current grants and contracts

1. *National Aeronautics and Space Administration (NASA),* "Generalized Trajectory Modeling and Prediction for Unmanned Aircraft Systems," $999,150, Jun. 2016 – Dec. 2017, PI: Ella Atkins, Co-PIs: Karthik Duraisamy, Anouck Girard, Ilya Kolmanovsky, Dimitra Panagou.

2. National Science Foundation (NSF), "University of Michigan Planning Grant: I/UCRC for the Center for Unmanned Aircraft Systems (C-UAS)," PI: Ella Atkins, Co-PIs: Carlos Cesnik, Dimitra Panagou, Adda Athanasopoulos-Zekkos. $20,000, June 2016 – June 2017. Supports the proposed Site Planning Grant Meeting and visits to potential corporate partners.

3. *Air Force Research Lab (AFRL) via Soar Technology,* "Testing Robustness of UAS Technology (TRUST), Phase II," $100,000 (University of Michigan subcontract only), Oct. 2015 – Nov. 2017, PI: John Sauter (Soar Tech).

4. *National Science Foundation (NSF),* "GOALI CPS: Maneuver and Data Optimization for High Confidence Testing of Future Automotive Cyberphysical Systems," $775,000, Oct. 2015 – Sept. 2018, PI: Ilya Kolmanovsky, Co-PIs: Ella Atkins and Barzan Mozafari.

5. *National Science Foundation (NSF),* "CPS: Synergy: Collaborative Research: Thermal-aware Management of Cyber-Physical Systems," $540,000 (University of Michigan, not including budget for collaborators at the University of Massachusetts), Oct. 2013 – Sep. 2017, PI: Kang Shin (UMich), Co-PIs: Mani Krishna (UMass PI), Ella Atkins (UMich), Israel Koren (UMass).

6. *Office of Naval Research (ONR),* "An Autonomous Innovator to Enhance Long-Duration Mission Success," $900,000, July 2013 – Oct 2017, PI: Ella Atkins, Co-PIs: Dennis Bernstein and Dawn Tilbury.

7. *National Aeronautics and Space Administration (NASA),* "Risk Analysis for Small Unmanned Aircraft in the National Airspace System," $1,274,073, Sept. 2011 – Aug. 2017, PI: Ella Atkins, Co-PIs: James Luxhoj (LCR – subcontract) and Dan Salvano (SAIC – subcontract).

c.3 Pending grants and contracts

1. *National Science Foundation (NSF),* "S&AS: FND: Smart Autonomy for Large-Scale Vehicle Teams," Smart & Autonomous Systems (Robotics) Program, $631,032, Sept. 2017 – Aug. 2020, PI: Ella Atkins.

2. *National Science Foundation (NSF),* "Phase II IUCRC University of Michigan: Center for Unmanned Aircraft Systems (C-UAS)," I/UCRC Program, $500,000, Sept. 2017 – Aug. 2022, Site Director (UMich PI): Ella Atkins; UMich Site Co-PIs: Carlos Cesnik,

Dimitra Panagou, Karthik Duraisamy; C-UAS PI: Tim McLain (BYU). Other participating institutions: University of Colorado, Virginia Tech, Georgia Tech.

3. *National Science Foundation (NSF),* "CPS: Small: Cyber-Physical Communication for Cooperative Human-Robot Mobility," Cyber-Physical Systems (CPS) Program, $500,000, Sept. 2017 – Aug. 2020, PI: Ella Atkins.

c.4 Publications and scholarly presentations

c.4.1 Full articles in refereed publications

1. P. Di Donato and E. Atkins, "Evaluating Risk to People and Property for Aircraft Emergency Landing Planning," *Journal of Aerospace Information Systems,* AIAA, Posted online: Apr. 8, 2017, doi: 10.2514/1.I010513.
2. S. Balachandran and E. Atkins, "A Markov Decision Process Framework for Flight Safety Assessment and Management," *Journal of Guidance, Control, and Dynamics,* AIAA, Vol. 40, Special Issue on Aircraft Loss of Control, pp. 817-830, 2017, doi: 10.2514/1.G001743.
3. P. Di Donato, S. Balachandran, K. McDonough, E. Atkins, and I. Kolmanovsky, "Envelope Aware Flight Management for Loss of Control Prevention given Rudder Jam," *Journal of Guidance, Control, and Dynamics,* AIAA, Vol. 40, Special Issue on Aircraft Loss of Control, pp. 1027-1041, 2017, doi: 10.2514/1.G000252.
4. R. Eubank, J. Bradley, and E. Atkins, "Energy-Aware Multiflight Planning for an Unattended Seaplane: Flying Fish," *Journal of Aerospace Information Systems*, AIAA, Vol. 14, pp. 73-91, 2017, doi: 10.2514/1.I010484.
5. H. Rastgoftar and E. Atkins, "A Novel Graph Theoretic Based Technique for Analyzing Conduction Problems," *Journal of Engineering Mathematics*, Springer, 2017, doi: 10.1007/s10665-017-9898-6.
6. A. Ten Harmsel, I. Olson, and E. Atkins, "Emergency Flight Planning for an Energy-Constrained Multicopter," *Journal of Intelligent and Robotic Systems*, Springer, Springer, Vol. 85, Issue 1, pp. 145-165, Jan. 2017, doi: 10.1007/s10846-016-0370-z.
7. Z. Li, D. Filev, I. Kolmanovsky, E. Atkins, and J. Lu, "A New Clustering Algorithm for Processing GPS-based Road Anomaly Reports with a Mahalanobis Distance," *Intelligent Transportation Systems Transactions,* IEEE, 2016, doi: 10.1109/TITS.2016.2614350.
8. Z. Li, I. Kolmanovsky, U. Kalabec, E. Atkins, J. Lu, and D. Filev, "Optimal State Estimation for Systems Driven by Jump-Diffusion Process with Application to Road Anomaly Detection," *Transactions on Control Systems Technology,* IEEE, 2016, doi: 10.1109/TCST.2016.2620062.
9. Z. Li, I. Kolmanovsky, E. Atkins, J. Lu, D. Filev, and Y. Bai, "Road Disturbance Estimation and Cloud-Aided Comfort-Based Route Planning," *Transactions on Cybernetics,* IEEE, 2016, doi: 10.1109/TCYB.2016.2587673.
10. E. Taheri, I. Kolmanovsky, E. Atkins, "Enhanced Smoothing Technique for Indirect Optimization of Minimum-Fuel Low-Thrust Trajectories," *Journal of Guidance, Control, and Dynamics,* AIAA, Vol. 39, pp. 2500-2511, 2016, doi: 10.2514/1.G000379.

11. P. Di Donato and E. Atkins, "Optimizing Steady Turns for Gliding Trajectories," *Journal of Guidance, Control, and Dynamics,* AIAA, Vol. 39, No. 12, pp. 2627-2637, 2016, doi: 10.2514/1.G000319.
12. H. Rastgoftar and E. Atkins, "Continuum Deformation of Multi-Agent Systems under Directed Communication Topologies," *Journal Dynamic Systems Measurement and Control,* ASME, 2016, doi: 10.1115/1.4033866.
13. Z. Li, I. Kolmanovsky, E. Atkins, J. Lu, and D. Filev, "H-infinity Filtering for Cloud-Aided Semi-active Suspension with Delayed Information", *Time Delay Systems: Theory, Numerics, Applications, and Experiments, Vol. 7,* Springer, pp. 283-297, 2017, doi: 10.1007/978-3-319-53426-8_19.
14. S. Balachandran, N. Ozay, and E. Atkins, "Verification Guided Refinement of a Flight Safety Assessment and Management System for Takeoff," *Journal of Aerospace Information Systems,* AIAA, Vol. 13, No. 9, 2016, doi: 10.2514/1.I010408.
15. H. Rastgoftar, H. Kwatny, and E. Atkins, "Asymptotic Tracking and Robustness of MAS Transitions under a New Communication Topology," *Transactions on Automation Science and Engineering,* IEEE, 2016, doi: 10.1109/TASE.2016.2547885.
16. E. Atkins, P. Di Donato, "Low-Altitude Rural to Urban Unmanned Aircraft System Operations," *Encyclopedia of Aerospace Engineering, UAS Volume,* Wiley & Sons, Vol. 9, 2016, doi: 10.1002/9780470686652.eae1139.
17. J. Rufa and E. Atkins, "UAS Navigation in an Urban Environment: A Systems Analysis," *Journal of Aerospace Information Systems*, AIAA, Vol. 12, pp. 710-727, Dec. 2015, doi: 10.2514/1.I010280.
18. Z. Li, I. Kolmanovsky, E. M. Atkins, J. Lu, D. Filev, and J. Michelini, "Road Risk Modeling and Cloud Aided Safety-based Route Planning," *Transactions on Cybernetics,* IEEE, Oct. 2015, doi: 10.1109/TCYB.2015.2478698.
19. J. Bradley and E. Atkins, "Optimization and Control of Cyber-Physical Vehicle Systems," *Sensors,* MDPI, September 2015, doi: 10.3390/s150923020.
20. S. Balachandran and E. Atkins, "Flight Safety Assessment and Management for Takeoff using Deterministic Moore Machines," *Journal of Aerospace Information Systems*, AIAA, September 2015, doi: 10.2514/1.I010350.
21. C. McGhan, A. Nasir, and E. Atkins, "Human Intent Prediction using Markov Decision Processes," *Journal of Aerospace Information Systems,* AIAA, Vol. 12, No. 5, pp. 393-397, May 2015, doi: 10.2514/1.I010090.
22. J. Bradley and E. Atkins, "Coupled Cyber-Physical System Modeling and Coregulation of a CubeSat," *Transactions on Robotics*, IEEE, Vol. 31, No. 2, pp. 60-74, April 2015, doi: 10.1109/TRO.2015.2409431.
23. D. Yeo, E. Atkins, L. Bernal, and W. Shyy, "Fixed-Wing Unmanned Aircraft In-Flight Pitch and Yaw Control Moment Sensing," *Journal of Aircraft,* AIAA, Vol. 52, No. 2, pp. 403-420, March 2015, doi: 10.2514/1.C032682.
24. G. Yi, J. Zhong, E. Atkins, C. Wang, "Trim State Discovery with Physical Constraints," *Journal of Aircraft,* AIAA, Vol. 52, No. 1, pp. 90-106, January 2015, doi: 10.2514/1.C032619.
25. D. Asadi, M. Sabzehparvar, E. Atkins, and H. Talebi, "Damaged Airplane Trajectory Planning based on Flight Envelope and Stability of Motion Primitives," *Journal of Aircraft,* AIAA, Vol. 51, No. 6, pp. 1740-1757, November 2014, doi:

10.2514/1.C032422.

26. E. Atkins, “Education in the Crosscutting Sciences of Aerospace and Computing,” *Journal of Aerospace Information Systems*, AIAA, Vol. 11, No. 10, pp. 726-737, October 2014, doi: 10.2514/1.I010193.
27. J. Richardson, P. Kabamba, E. Atkins, A. Girard, “Safety Margins for Flight Through Stochastic Gusts,” *Journal of Guidance, Control, and Dynamics*, AIAA, Vol. 37, No. 6, pp. 2026-2030, June 2014, doi: 10.2514/1.G000299.
28. J. Broderick, D. Tilbury, and E. Atkins, “Characterizing Energy Usage of a Commercially Available Ground Robot: Method and Results,” *Journal of Field Robotics*, Wiley, Vol. 31, No. 3, pp. 441-454, May/June 2014, doi: 10.1002/rob.21507.
29. J. Richardson, E. Atkins, P. Kabamba, A. Girard, “Scaling of Airplane Dynamic Response to Stochastic Gusts,” *Journal of Aircraft*, AIAA, Vol. 51, No. 5, pp. 1554-1566, May 2014, doi: 10.2514/1.C032410.
30. J. Broderick, D. Tilbury, and E. Atkins, “Optimal Coverage Trajectories for a UGV with Tradeoffs for Energy and Time,” *Autonomous Robots*, Springer, Vol. 36, No. 3, pp. 257-271, March 2014, doi: 10.1007/s10514-013-9348-x.
31. J. Bradley and E. Atkins, “Cyber-Physical Optimization for Unmanned Aircraft Systems,” *Journal of Aerospace Information Systems*, AIAA, Vol. 11, No. 1, pp. 48-60, January 2014, doi: 10.2514/1.I010105.
32. C. McGhan and E. Atkins, "Human Productivity in a Workspace Shared with a Safe Robotic Manipulator," *Journal of Aerospace Information Systems*, AIAA, Vol. 11, No. 1, pp. 1-18, January 2014, doi: 10.2514/1.54993.
33. D. Yeo, E. Atkins, L. Bernal, and W. Shyy, “Experimental Characterization of Lift on a Rigid Flapping Wing,” *Journal of Aircraft*, AIAA, Vol. 50, No. 6, pp. 1806-1821, November 2013, doi: 10.2514/1.C032168.
34. J. Richardson, E. Atkins, P. Kabamba, and A. Girard, “Envelopes for Flight through Stochastic Gusts,” *Journal of Guidance, Control, and Dynamics*, AIAA, Vol. 36, No. 5, pp. 1464-1476, September 2013, doi: 10.2514/1.57849.
35. C. Cesnik, P. Senatore, W. Su, E. Atkins, C. Shearer, and N. Pitcher, "X-HALE: A Very Flexible UAV for Nonlinear Aeroelastic Tests," *AIAA Journal*, AIAA, Vol. 50, No. 12, pp. 2820-2833, December 2012, doi: 10.2514/1.J051392.
36. J. Bradley and E. Atkins, "Toward Continuous State-Space Regulation of Coupled Cyber and Physical Systems," *Proceedings of the IEEE*, IEEE, Vol. 100, No. 1, pp. 60-74, January 2012, doi: 10.1109/JPROC.2011.2161239.
37. E. Atkins, “Certifiable Autonomous Flight Management for Unmanned Aircraft Systems,” *The Bridge*, National Academy of Engineering (NAE), Vol. 40, No. 4, pp. 35-43, Winter 2010.
38. E. Atkins, "Aerospace Avionics Systems," *Encyclopedia of Aerospace Engineering*, Wiley & Sons, Vol. 8, Part 38, pp. 4787-4797, Dec. 2010.
39. S. Hong, R. Eubank, and E. Atkins, “Multiresolution SIFT Video Stabilization Scheme for Enhanced Feature Tracking and Registration,” *Dynamics of Continuous, Discrete & Impulsive Systems, Series B (DCDIS-B), http:www.watam.org*, Vol. 17, No. 4, pp. 457-474, August 2010.
40. E. Atkins, "Driver Override for Safety-Critical Vehicles and Networks," *International*

Journal of Passenger Cars – Electronic and Electrical Systems, Society of Automotive Engineers (SAE), Vol. 2, No. 1, pp. 271-280, 2009, doi: 10.4271/2009-01-0751.

41. J. Lennon and E. Atkins, "Preference-Based Trajectory Generation," *Journal of Aerospace Computing, Information, and Communication,* (subsequently renamed *Journal of Aerospace Information Systems*), AIAA, Vol. 6, No. 3, pp. 142-170, March 2009, doi: 10.2514/1.36214.
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109. D. Chavez-Clemente and E. Atkins, "Optimization of Tetrahedral Satellite Formations," *Proc. AIAA Guidance, Navigation, and Control Conference,* Providence, RI, August 2004.

110. E. Atkins, "Dynamic Waypoint Generation given Reduced Flight Performance," in *Proceedings of the AIAA Aerospace Sciences Conference*, Reno, NV, January 2004.

111. M. Xue and E. Atkins, "Noise Sensitive Final Approach Trajectory Optimization for Runway-Independent Aircraft," in *Proc. of the AIAA Guidance, Navigation, and Control Conference,* Austin, TX, August 2003.

112. H. Li, E. Atkins, E. Durfee, and K. Shin, "Resource Allocation for a Limited Real-Time Agent," in *Proc. of the Autonomous Agents and Multi-Agent Systems (AAMAS) Conference*, July 2003.

113. G. Gopalan, M. Xue, E. Atkins, and F. Schmitz, "Longitudinal-Plane Simultaneous Non Interfering Approach Trajectory Design for Noise Minimization," *Proc. of the American Helicopter Society (AHS) 59th Annual Forum*, May 2003.

114. E. Atkins and Y. Pennecot, "Autonomous Satellite Formation Assembly and Reconfiguration with Gravity Fields," *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2002.

115. E. Atkins, J. Lennon, and R. Peasco, "Vision-based Following for Cooperative Astronaut-Robot Operations," *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2002.

116. E. Atkins and R. Sanner, "QoS Tradeoffs for Guidance, Navigation, and Control," *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2002.

117. I. Alonso-Portillo and E. Atkins, "Adaptive Trajectory Planning for Flight Management Systems," *Proceedings of the AIAA Aerospace Sciences Conference*, Reno, NV, January 2002 (AIAA 2002-1073).

118. Y. Pennecot, E. Atkins, and R. Sanner, "Intelligent Spacecraft Formation Management and Path Planning," *Proceedings of the AIAA Aerospace Sciences Conference*, Reno, NV, January 2002 (AIAA 2002-1072).

119. J. Lennon and E. Atkins, "Color-based Vision Tracking for an Astronaut EVA Assist Vehicle," *Proceedings of the SAE International Conference on Environmental Systems (ICES)*, Orlando, FL, July 2001.

120. E. Atkins, "Autonomous Hard Real-time Response in Safety-Critical Systems," *Proceedings of the 6th International Symposium on Artificial Intelligence and Robotics & Automation in Space: I-SAIRAS 2001*, Canadian Space Agency, St.-Hubert, Quebec, Canada, June 2001.

121. E. Atkins, T. Abdelzaher, K. Shin, and E. Durfee, "Planning and Resource Allocation for Hard Real-time, Fault-Tolerant Plan Execution", *Proceedings of the Third International Conference on Autonomous Agents*, pp. 244-251, Seattle, WA, May 1999.

122. E. Atkins, R. Miller, T. VanPelt, K. Shaw, W. Ribbens, P. Washabaugh, D. Bernstein, "Solus: An Autonomous Aircraft for Flight Control and Trajectory Planning Research," *Proceedings of the American Control Conference (ACC)*, Vol. 2, pp. 689-693, June 1998.

123. E. Atkins, E. Durfee, and K. Shin, "Detecting and Reacting to Unplanned-for World States," *Proceedings of the Fourteenth National Conference on Artificial Intelligence* (*AAAI-97)*, pp. 571-576, July 1997. (strictly reviewed)

124. C. McVey, E. Atkins, E. Durfee, and K. Shin, "Development of Iterative Scheduler to Planner Feedback," *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI-97)*, pp. 1267-1272, August 1997. (strictly reviewed)

125. T. Abdelzaher, E. Atkins, and K. Shin, "QoS Negotiation in Real-Time Systems and Its Application to Automated Flight Control," *Real-time Technology and Applications Symposium (RTAS-97)*, pp. 228-238, June 1997. *[Nominated for Best Paper.]* (highly reviewed)

126. E. M. Atkins, E. H. Durfee, and K. G. Shin, "Plan Development using Local Probabilistic Models," *Proceedings of the Twelfth Conference on Uncertainty in Artificial Intelligence*, pp. 49-56, August 1996. (highly reviewed)

127. D. Cossey, N. Abhyankar, E. Atkins, R. Brillhart, and D. Hunt, "Modal Survey of the ASTREX Test Article," *Proceedings of SPIE -- The International Society for Optical Engineering*, vol. 1923, part 2, pp. 1409-1412, 1993.

c.4.4 Abstracts in non-refereed conference proceedings

1. M. Ransan and E. Atkins, "A Collaborative Model for Astronaut-Rover Exploration Teams," *AAAI-2006 Spring Symposium on Human-Robot Teams*, Association for the Advancement of Artificial Intelligence (AAAI), March 2006.
2. E. Atkins and G. Moylan, "Blocks in Space: Intelligent Self-Assembly Using Optimal Control Trajectory Planning," Working Notes of the *Intl. Conf. on AI Planning Systems (ICAPS) Workshop on Plan Execution*, June 2005.
3. J. Lennon and E. Atkins, "Making Decisions about Motion," *AAAI Fall Symposium on Cognitive Science and Robotics*, AAAI, October 2004.
4. E. Atkins, "Flight Plan Management with George Jetson as Pilot," *AAAI Spring Symposium on Interaction between Humans and Autonomous Systems over Extended Operation*, AAAI, March 2004.
5. J. Lennon and E. Atkins, "A Rule-based Strategy for Astronaut Following Operations," *AAAI Spring Symposium on Human Interaction with Autonomous Systems in Complex Environments*, AAAI, March 2003.
6. A. Skotowski and E. Atkins, "Scheduling Actions with State-Dependent Resource Requirements," *AAAI Spring Symposium on Foundations and Applications of Spatio-Temporal Reasoning*, AAAI, March 2003.
7. L. Fesq and E. Atkins, "AAAI Spring Symposium Series: Robust Autonomy Symposium Summary", *AI Magazine*, Fall 2001.
8. E. Atkins, "Knowledge Representation for Real-time Plan Development," *AAAI-2000 Workshop on Representational Issues for Real-World Planning System*, Technical Report WS-00-07, AAAI, pp. 1-5, July 2000.
9. E. Atkins, "The Hybrid Planning-Scheduling System in CIRCA-II," *AAAI-2000 Workshop on Constraints and AI Planning*, Technical Report WS-00-02, AAAI, pp. 7-10, July 2000.
10. H. Li, E. Atkins, E. Durfee, K. Shin, "Resource Allocation for a Limited Real-time Agent Using a Temporal Probabilistic World Model," Working Notes of the *AAAI Spring Symposium on Real-time Autonomous Systems*, AAAI, pp. 47-55, March 2000.
11. E. Atkins, E. Durfee, K. Shin, "Autonomous Flight with CIRCA-II," *Autonomous Agents-99 Workshop on Autonomy Control Software*, May 1999.
12. E. Atkins, E. Durfee, K. Shin, "Buying Time for Resource-Bounded Planning," *AAAI-97 Workshop: Building Resource-Bounded Reasoning Systems Technical Report*, AAAI, pp. 7-11, July 1997.
13. E. Atkins, E. Durfee, and K. Shin, "Building a Plan with Real-Time Execution Guarantees," *AAAI-96 Workshop on Structural Issues in Planning and Temporal Reasoning*, AAAI, pp. 1-6, August 1996.

c.4.5 Publications in popular press/magazines

1. T. Ersal, Y. Kim, J. Broderick, T. Guo, A. Sadrpour, A. Stefanopolou, J. Siegal, D. Tilbury, E. Atkins, H. Peng, J. Jin, and A. G. Ulsoy, "Keeping ground robots on the move through battery and mission management," *Dynamic Systems and Control Magazine*, ASME, Vol. 2, No. 2, June 2014.

c.4.6 Other submitted publications

1. H. Rastgoftar and E. Atkins, "Cooperative Aerial Payload Transport Guided by an In Situ Human Supervisor," *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Vancouver, BC, Canada, 2017 (submitted).
2. H. Rastgoftar, X. Ni, and E. Atkins, "An Online Decision Model for Autonomous Systems with Nonlinear Dynamics," *ASME Journal of Dynamic System Measurement and Control*, 2017 (submitted).
3. H Rastgoftar and E. Atkins, "Continuum Deformation of a Multiple Quadcopter Payload Delivery Team without Inter-Agent Communication," *Journal of Guidance Control and Dynamics*, AIAA, 2017 (submitted).

c.4.7 Invited presentations and panels

Presentations:

1. Invited Presenter, "Safe Autonomous Flight in Off-Nominal Conditions," *Aerospace Engineering Faculty and Staff Brown Bag Lunch & Learn*, March 28, 2017.
2. Keynote Presenter, "Safe Autonomous Manned and Unmanned Flight in Off-Nominal Conditions," *Future Technologies Conference (FTC)*, SAI, San Francisco, CA, Dec. 7, 2016.
3. Seminar, "US Airways Flight 1549 Seven Years Later: Safety, Autonomy, and the Human Element," University of Michigan, Nov. 22, 2016,

   https://www.youtube.com/watch?v=eURVKcaG6Ps&feature=youtu.be&utm_source=getresponse&utm_medium=email&utm_campaign=berlykim&utm_content=December+2016+%7C+Happy+Holidays+from+Michigan+Aerospace.
4. Invited Speaker, "Safe Autonomous Flight in Off-Nominal Conditions," *Ann Arbor City Club*, December 14, 2016.
5. Invited Seminar Speaker, "Toward Safe and Autonomous Manned and Unmanned Flight in Off-Nominal Conditions," *Duke University*, September 7, 2016.
6. Lecture (2 hours), "Unmanned Aircraft System (UAS) or "Drone" Technology," *Society of Active Retirees (SOAR)*, Detroit, MI, May 11, 2016.
7. Invited Speaker, "Technologies for Safe and Autonomous Unmanned Aircraft Systems (UAS), *Rotary Club of Ann Arbor*, February 2016.
8. Podcast, "The promise (and the risks) of drones", http://podcast.ft.com/2015/09/02/the-promise-and-the-risks-of-drones/, Sept. 2, 2015.
9. Invited Seminar Speaker, "Toward Safe and Autonomous Flight in Public and Immediate Reaches Airspace," *University of North Texas*, Denton, TX, August 28, 2015.
10. Podcast, "UAV109 Who has the Right to Write Drone Laws?" *The UAV Digest*, http://theuavdigest.com/uav109-who-has-the-right-to-write-drone-laws/, Aug. 21, 2015.
11. Invited Presentation, "Toward Safe and Autonomous Flight in Public and Immediate Reaches Airspace," *Stanford University*, Palo Alto, CA, July 31, 2015.

12. Invited Seminar Speaker, “Toward Safe and Autonomous Flight in Public and Immediate Reaches Airspace,” *University of Minnesota,* Minneapolis, MN, March 6, 2015.
13. Invited Seminar Speaker, “Toward Safe and Autonomous Aircraft with Access to Airspace,” *NASA Langley Research Center,* July 31, 2014.
14. Invited Seminar Speaker, “UAS Autonomy and Airspace Management,” *Georgia Tech,* Atlanta, GA, April 2014.
15. Plenary Speaker, “UAS Navigation and Control,” *Michigan UAS Conference,* Ann Arbor, MI, October 2013.
16. Invited Seminar Speaker, “Robust Autonomy: A Science-Optimal Spacecraft Mission Planner with Fault Tolerance,” *NASA Jet Propulsion Laboratory (JPL),* November 2012.
17. Invited Seminar Speaker, “Toward Safe and Autonomous Aerospace Systems,” *University of Nebraska – Lincoln,* Computer Science & Engineering Dept., November 2012.
18. Invited Seminar Speaker, “Toward Safe and Autonomous Aerospace Systems,” *Virginia Tech,* Aerospace & Ocean Engineering Dept., November 2012.
19. Invited Presentation, “From CPS to UAS in the NAS,” *Defense Science Study Group (DSSG),* Institute for Defense Analysis (IDA), June 2012.
20. Invited Speaker, “Flying Fish the Unmanned Seaplane”, *Electric Vehicles Land-Sea-Air, Europe,* IDTechEx, Stuttgart, Germany, June 28-29, 2011, second invited presentation (same talk): San Jose, CA, March 27-28, 2012.
21. Invited Seminar Speaker, "Toward Cyber-Physical Coupling in Aerospace Education and Research," *University of Illinois (Urbana-Champaign),* October 2011.
22. Invited Speaker, "Certifiable Autonomous Flight Management for Unmanned Aircraft Systems," *National Academy of Engineering (NAE) US Frontiers of Engineering (USFOE) Symposium,* September 2010.
23. Invited Speaker, "Certifiable Autonomous Flight Management for Unmanned Aircraft Systems (extended presentation)," *IDGA UAV Summit (UAV Focus Day),* April 2010.
24. Invited Speaker, "The Flying Fish Persistent Ocean Surveillance Platform," *Aerospace Control and Guidance Systems Committee (ACGSC) Meeting,* Lake Tahoe, CA, March 2010.
25. Invited Speaker, "A Damage-Resilient Flight Planning and Guidance System for Safe, Collaborative Emergency Management," *NASA Aviation Safety Program Annual Technical Conference,* Reston, Virginia, November 2009.
26. Keynote Speaker, “Emergency Flight Planning and Guidance with Reduced Performance”, *International Symposium on Systems and Control in Aerospace and Astronautics (ISSCAA),* Shenzhen, China, December 2008.
27. Invited Speaker, “Autonomous Decision-Making for Safe Flight Management,” BlueOrigin (www.blueorigin.com), March 15, 2008.
28. Invited Seminar Speaker, “Practical Autonomous Decision Making for Flight Management Systems”, *Wayne State University,* Detroit, MI, January 2008.

29. Invited Speaker, "Practical Autonomous Decision-Making for Flight Management Systems," Soar Technology, Inc. (www.soartech.com), November 2007.
30. Invited Speaker, "Physically-Proximal Human-Robot Collaboration for Air and Space Applications," *PerMIS (Performance Metrics for Intelligent Systems) Workshop,* NIST, August 2007.
31. Invited Seminar Speaker, "Air Vehicle Mission Adaptation to Damage and Failures", *Eglin Air Force Base (Air Force Research Lab),* July 22, 2007.
32. Invited Speaker, "Smart Air Transportation: Future Research Needs and Enhanced Safety through Emergency Flight Planning," *IEEE RTAS Workshop on Smart Transportation,* Bellevue, WA, April 3, 2007.
33. Invited Seminar Speaker, "Emergency Flight Planning with a Reduced Flight Envelope," *Western Michigan University Dept. of Mechanical and Aeronautical Engineering Seminar,* Kalamazoo, MI, March 13, 2007.
34. Invited Speaker, "Effects of Autonomy on Risk in Air and Space Systems," Technological Risks session, *9th Annual German-American Frontiers of Engineering Meeting,* sponsored by the National Academy of Engineering (NAE), Murray Hill, NJ, May 2006.
35. Invited Speaker, "Emerging Automation Technologies for Manned Cockpit, UAS and Airspace Management," presented to *Panel E: NRC Decadal Survey of Aeronautics,* Georgia Tech, Atlanta, GA, December 5, 2005.
36. Invited Speaker, "Motion Planning and Cooperative Execution for Air and Space Sensor Teams," *IDGA Military Sensors Conference*, IDGA (Institute for Defense and Government Advancement), Washington, DC, October 26, 2005.
37. Invited Seminar Speaker, "Robust Mission and Trajectory Planning for Air and Space Vehicles," *Texas A&M University,* College Station, TX, October 25, 2005.
38. Invited Seminar Speaker, "Robust Robotic Explorers with Symbolic and Continuous Reasoning Capabilities," *NASA Goddard Space Flight Center Information Sciences and Technology (IS&T) Colloquium*, Greenbelt, MD, December 15, 2004.

Panels:

1. Panelist, "Vetronics, Software and Cybersecurity," *AeroAuto Conference,* SpeedNews and Aviation Week, The Henry, Dearborn, MI, May 4, 2017.
2. Panelist, "Future of Aviation," *University of Michigan SGT,* Mar. 27, 2017.
3. Panelist, "Establishing Trust in Autonomous Systems," *Infotech@Aerospace Conference at Scitech,* AIAA, Jan. 2017.
4. Panelist, "Formal Methods for Software Verification," *Infotech@Aerospace Conference at Scitech,* AIAA, Jan. 2017.
5. Panelist and Panel Co-Chair, "Autonomous Flight," *American Association for Artificial Intelligence (AAAI) Conference,* AAAI, Feb. 16, 2016.
6. Panelist, "Assured Autonomy," *Infotech@Aerospace Conference at Scitech,* AIAA, Jan. 2016.
7. Panelist, "Intelligent Systems Roadmap," *Infotech@Aerospace Conference at Scitech,* AIAA, Jan. 2016.

8. Panelist, "Small UAS in the Educational Setting", *UAS Traffic Management (UTM) Conference,* NASA/AUVSI, NASA Ames, Moffett Field, CA, July 2015.
9. Panelist, "UAS Panel Discussion," *Research on the Hill,* organized by the University of Maryland, Washington, DC, July 2015.
10. Panel Chair, "Autonomy Research Agenda for Civil Aviation," *Infotech@Aerospace Conference at Scitech*, AIAA, January 2015.
11. Panelist, "Intelligent Systems Technical Committee Panel on Autonomy," *Infotech@Aerospace Conference at Scitech,* AIAA, January 2015.
12. Panelist, "Panel I: Integration of Autonomous Systems: Technology & Policy Challenges"**,** *Preparing for Unmanned Systems: Challenges for the Next Decade,* Virginia Tech (Applied Research Corporation), Arlington, VA, May 2014.
13. Panelist, "Software Engineering Education in Aerospace," *Aerospace Sciences Meeting,* AIAA, January 2011.
14. Panelist, "Space Robotics: Missions and Autonomy Challenges," *Spacecraft Autonomy: New Directions for the Future, IEEE Aerospace Conference,* Big Sky, MT, March 2006.
15. Panelist, "Strategic Planning and Contingency Response for Aerospace Applications," *Intelligent Systems Workshop, Infotech@Aerospace Conference,* AIAA, Crystal City, VA, September 2005.

c.5 Industry interactions (consulting arrangements, board memberships, etc.)

1. Advisory Committee, NUSTAR (New York), (2017 – present)
2. Board of Governors, *Northern Michigan Unmanned Aerial Systems Consortium (NMUAS)* (2013 – 2016)
3. Expert Legal Consultant (Aviation): Holland & Knight (2009-2013), Bassford-Remele (2010-2012)
4. Engineering Consultant: IDA (Institute for Defense Analysis) (2005 – 2014), Soar Technology (2011)

d. Service

d.1 Major committee assignments in the Department, College, and/or University (University of Michigan only)

1. Executive Committee, Robotics Program, 2016 – present, Member
2. Institutional Autonomous Systems Committee (IASC), 2016 – present, Member
3. Undergraduate Committee, Aerospace Engineering, 2016- present, Member
4. Graduate Committee, Robotics Program, 2014 - present, Chair
5. Faculty Search Committee, Aerospace Engineering, 2014 - present, Member
6. Robotics Building Committee, Robotics Program, 2014 - present, Member
7. Unmanned Systems Committee, 2015 – 2016, Member
8. Program Director Search Committee, Robotics Program, 2014 - 2016, Member

9. Robotics Research & Development Engineer Search, 2014 – 2015, Chair
10. Steering Committee, Robotics Program, 2012 - 2016, Member
11. Internal Review Committee, Aerospace Engineering, 2012 – 2014, Chair
12. Department Chair Search Committee, Aerospace Engineering, 2011 - 2012, Member
13. Engineering 101 / 151 Steering Committee, 2008-2012, Member; Chair (2009-2011)
14. Faculty Search Committee (CoE), Robotics, 2007 – 2008, Member
15. Undergraduate Committee, Aerospace Engineering, 2007 - 2009, Member

d.2 Administrative duties at U of M

1. Associate Director of Graduate Programs, Robotics (2017 – present)
2. Graduate Chair, Robotics Program (2014 – 2017)
3. Aerospace Engineering Student Undergraduate Advisor (2007 – present)
4. University of Michigan AIAA Student Chapter Advisor (2014 – present)

d.3 Service to government or professional organizations, and service on review board/study panels

1. Proposal Reviewer, *NASA Earth Science AI Systems Technologies (AIST) Program*, 2017.
2. Proposal Reviewer, *NASA Space Technology Research Fellowship (NSTRF) Program*, 2017.
3. Program Committee, *The 9th NASA Formal Methods (NFM) Symposium,* NASA Ames Research Center, Moffett Field, CA, (May 2017).
4. Proposal Review Panelist, *Cyber-Physical Systems (CPS) Program,* NSF, July 2016 (and previous years).
5. Peer Review Board, *Crew Systems and Aviation Operations Branch,* NASA Langley Research Center, Hampton, VA (Jan. 2016)
6. Reviewer, "A 21st Century Cyber-Physical Systems Education," *National Academies Press*, 2016.
7. Autonomy Breakout Session Chair (and Intelligent Systems Roadmap co-author), "Intelligent Systems Workshop," *AIAA Intelligent Systems Technical. Committee,* Dayton, OH, 2014.
8. Associate Editor, *AIAA Journal of Aerospace Information Systems* (2013-present)
9. Volume Editor, Unmanned Aircraft Systems, *Encyclopedia of Aerospace Engineering* (Wiley) (2013-2016)
10. Study Committee Member (Report Co-Author), "Autonomy Research for Civil Aviation: Toward a New Era of Flight," *National Research Council* (2013-2014)
11. Member, *Institute for Defense Analysis (IDA) Defense Science Study Group (DSSG)* (2012-2013)
12. Study Member, "Engineering Resilient Space Systems," *Keck Institute for Space Studies*, CalTech/JPL (2012-2013)
13. Member, Aeronautics & Space Engineering Board (ASEB), *National Academy / National Research Council* (2011-2015)
14. Member, Aeronautics Roundtable, *National Research Council* (2011-2014)

15. Program committee, *International Conference on Cyber-Physical Systems (ICCPS)*, IEEE (2011-2014)
16. Member, *University of Michigan Senate Assembly* (2011-2013)
17. Member, *AIAA Software Technical Committee* (2011-present)
18. Committee Member (Report Editor), "NASA Aviation Safety Program Review," *National Research Council* (2009-2010)
19. Section Editor, *Encyclopedia of Aerospace Engineering* (Wiley) (2008-2014)
20. Chair, *AIAA Intelligent Systems Technical Committee* (2007-2009)
21. Program Committee, Intelligent Systems Track, *AIAA Aerospace Sciences Meeting* (2007-2011)
22. Program Committee, *5th International Workshop on Planning and Scheduling for Space*, Space Telescope Science Institute, Baltimore, MD (2006)
23. Technical Program Chair, *AIAA Infotech@Aerospace Conference* (2005-2007)
24. Study Committee Member (Report Author), "Panel E: Intelligent and Autonomous Systems, Operations, and Decision Making, Human Integrated Systems, Communication and Networking," *Decadal Survey of Civil Aeronautics, National Research Council* (2005-2006)
25. Review Panelist for NASA Jet Propulsion Lab's Advanced Multi-Mission Operational Systems (AMMOS) Program, 2005 – 2011 (panel chair 2010-2011).
26. Associate Editor, *AIAA Journal of Aerospace Computing, Information, & Communication* (JACIC) (2004-2013) (JACIC became the *Journal of Aerospace Information Systems* in 2013)
27. Invited Session Organizer, Session Chair, Program Committee, *AIAA Intelligent Systems Conference*, Chicago (2004)
28. Local Program Chair, Session Chair, *IEEE Intl. Conference on Robotics & Automation* (ICRA) (2002)
29. Program committee, *AAAI Spring Symposium on Safe Learning Agents*, Stanford University (2002)
30. Member, *AIAA Intelligent Systems Technical Committee* (2001-present)
31. Co-chair, *AAAI Spring Symposium on Robust Autonomy*, Stanford University (2001)
32. Member, *AIAA Space Automation and Robotics Technical Committee* (2000-2003)
33. Paper Reviewer, AIAA and IEEE journals and conferences (2000 - present)
34. Proposal Reviewer, NSF, NASA (2001 - present) (specific panels not listed for brevity)

d.4 Mentoring activities involving junior faculty members or post-doctoral scholars

1. Postdoctoral Mentor to **Dr. Wei Ren** (University of Maryland); Dr. Ren is now a full professor at the University of California – Riverside.
2. Postdoctoral Mentor to **Dr. Justin Bradley** (University of Michigan); Dr. Bradley is now a tenure-track Assistant Professor at the University of Nebraska (Computer Science Dept.).
3. Mentor to **Dr. Guoxing Yi** (Visiting Scholar from Harbin Institute of Technology); Dr. Yi returned to a tenure-track position at Harbin Institute of Technology in China.
4. Postdoctoral Mentor to **Dr. Hossein Rastgoftar** (ongoing).

d.5 Other

- Airport Owner and Operator, Shamrock Field, Brooklyn, MI; a Michigan-certified Public Airport (2010 – present)