

Curriculum Vitae

Ella M. Atkins

Professor, Aerospace Engineering
Associate Director of Graduate Programs, Robotics Institute
University of Michigan
3056 FXB, 1320 Beal Ave., Ann Arbor, MI 48109-2140
ematkins@umich.edu

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 Director, Robotics Institute, 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

- Robotics Leadership Award, 2020
- Fellow, American Institute of Aeronautics & Astronautics (AIAA), 2019
- Inaugural President's Award for National and State Leadership, University of Michigan, 2017
- Trudy Huebner Service Excellence Award, University of Michigan, 2013
- Aerospace Engineering Department Award, University of Michigan, 2009, 2020
- NSF CAREER Award, 2004-2009
- 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
- West Virginia's Junior Miss, 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.
- **ROB 599: Ethics for Robotics (new in Winter 2018):** The expected proliferation of advanced autonomous robots raises a number of practical questions. Will robots take over a substantial fraction of available jobs, putting many people out of work? Could this greatly increase inequality or even destabilize our market economy? Or, as in previous industrial revolutions, will automation create more new jobs than it destroys? Can the “blind hand” of the marketplace take care of this, or must we take more deliberate action? We are already taking certain steps, but are ongoing policy, law, and education efforts well-conceived or even appropriate? Who needs to take action going forward? Technologists? Policy-makers? Industry? Educators? International organizations? Beyond jobs, how do we reconcile challenges in safety, privacy, and human/robot rights? This course covers these issues and more, with readings, guest lectures, and discussions. Seminar attendance and two written reports are required.

- **AERO 740 / ROB 599 (new in Winter 2019): Experimental Unmanned Aircraft Systems:** This course offers a hands-on design, build, test experience for small unmanned aircraft systems (UAS) or 'drones'. The first half of the course offers students the opportunity to start with a bin of parts and build a custom quadrotor with integrated electronics including a Beaglebone blue processor. Students calibrate an Inertial Measurement Unit (IMU) using a rate table and characterize motor and propeller performance on a benchtop dynamometer. Students learn to use the Optitrack and Qualisys motion capture systems and flight test in the M-Air netted facility. In the second half of the course students design, build, and test a "quadplane" in which a wing and tail augment a quadcopter to extend range and endurance. Student groups conduct assembled vehicle wind tunnel load cell tests to obtain aerodynamic model coefficients under different free stream flow and thrust conditions. Outdoor flights in vertical and transition modes are conducted in M-Air.
- b.2 Courses taught at the University of Michigan (last 7 years):
- **EECS 592 (Foundations of Artificial Intelligence)**
 - **ROB 599 (Ethics for Robotics)**
 - **AERO 740 (Experimental UAS)**
 - **AERO 552 (Aerospace Information Systems)**
 - **AERO 450 (Flight Software Systems)**
 - **ROB 550 (Robotic Systems Laboratory)**
 - **AERO 201 (Introduction to Aerospace Engineering)**
 - **ENGR 151 (Accelerated Intro to Computers & Programming)**
- b.3 Ph.D. Committees chaired
1. **Matthew Romano**, 2022 (expected), (Robotics Program PhD Candidate).
 2. **Akshay Mathur**, 2022 (expected), (Robotics Program PhD Pre-Candidate).
 3. **Prince Kuevor**, 2022 (expected), (Robotics Program PhD Candidate) (jointly advised with James Cutler (Aerospace)).
 4. **Prashin Sharma**, 2021 (expected), (Robotics Program PhD Candidate).
 5. **Jeremy Castagno**, 2021 (expected), (Robotics Program PhD Candidate).
 6. **Cosme Ochoa**, 2020 (expected), "UAS Trajectory Prediction and Anomaly Management," Chair (Robotics Program PhD Candidate).
 7. **Yu (Brian) Yao**, 2020 (expected), "A Smart Black Box for Automotive Diagnostics," (Robotics Program PhD Candidate).
 8. **Mia Stevens**, 2019, "Geofencing for Small Unmanned Aircraft Systems in Complex Low Altitude Airspace," (Research Engineer, Aurora Flight Sciences).
 9. **Pedro di Donato**, 2017, "Toward Autonomous Aircraft Emergency Landing Planning," (Current Position: National Civil Aviation Agency, Brazil).
 10. **Sweewarman Balachandran**, 2016, "Flight Safety Assessment and Management," (Current Position: Research Scientist, NASA Langley / NIA).
 11. **Zhaojian Li**, 2016, "Cloud-Aided Decision Aids for Automotive Applications," Co-Chair (Current Position: Assistant Professor, Mechanical Engineering, Michigan State University) (jointly advised with Ilya Kolmanovksy (Aerospace)).
 12. **John Broderick**, 2015, "Energy and Mobility Management of a Ground Robot to Increase Operational Capacity," (Current Position: Project Engineer, Ford Motor Company) (jointly advised with Dawn Tilbury (Mechanical Engineering)).

13. **Justin Bradley**, 2014, “Toward Co-Design of Autonomous Aerospace Cyber-Physical Systems,” (Current Position: Assistant Professor, Computer Science and Engineering, University of Nebraska-Lincoln).
14. **Justin Rufa**, 2014, “Location-Based Sensor Fusion for UAS Urban Navigation,” (Current Position: Director of Research/Technology, Assistant Professor, US Air Force Academy, Colorado Springs).
15. **Heejun Choi**, 2014, “Time-Optimal Paths for a Dubins Car and Dubins Airplane with a Unidirectional Turning Constraint,” (Current Position: Senior Engineer, Samsung Research AI Center).
16. **Catharine McGhan**, 2014, “Safe and Efficient Robot Action Choices Using Human Intent Prediction in Physically-Shared Space Environments,” (Current Position: Assistant Professor, Aerospace Engineering, University of Cincinnati).
17. **Derrick Yeo**, 2013, “Aerodynamic Sensing for Autonomous Unmanned Aircraft Systems”, (Current Position: Assistant Research Scientist, University of Maryland).
18. **Johnhenri Richardson**, 2013, “Quantifying and Scaling Airplane Performance in Turbulence,” (Current Position: Business Development, Northrop Grumman Technology Services) (jointly advised with Pierre Kabamba, Anouck Girard (Aero)).
19. **Ali Nasir**, 2012, “Comprehensive Fault Tolerance and Science-Optimal Attitude Planning for Spacecraft Applications”, (Current Position: Assistant Professor, University of Central Punjab, Pakistan) (jointly advised with Ilya Kolmanovsky (Aerospace)).
20. **Ryan Eubank**, 2012, “Autonomous Flight, Fault, and Energy Management of the Flying Fish Solar-Powered Seaplane,” (Current Position: Research Engineer, MIT Lincoln Laboratory).
21. **Min Xue**, 2006 (University of Maryland), “Real-Time Terminal Area Trajectory Planning for Runway Independent Aircraft”, (Current Position: Research Scientist, NASA Ames Research Center).
22. **Jamie Lennon**, 2006 (University of Maryland), “An Architecture for the Autonomous Generation of Preference-Optimized Trajectories”, (Current Position: Group Lead, Project Engineer, Naval Research Laboratory (NRL)).

c. Research

c.1 Past grants and contracts

1. *National Science Foundation (NSF)*, “GOALI CPS: Maneuver and Data Optimization for High Confidence Testing of Future Automotive Cyberphysical Systems,” \$775,000, Oct. 2015 – Sept. 2019, PI: Ilya Kolmanovsky, Co-PIs: Ella Atkins and Barzan Mozafari.
2. *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. 2019, PI: Kang Shin (UMich), Co-PIs: Mani Krishna (UMass PI), Ella Atkins (UMich), Israel Koren (UMass).
3. *National Aeronautics and Space Administration (NASA)*, “Generalized Trajectory Modeling and Prediction for Unmanned Aircraft Systems,” \$999,150, Jun. 2016 – Dec.

- 2018, PI: Ella Atkins, Co-PIs: Karthik Duraisamy, Anouck Girard, Ilya Kolmanovsky, Dimitra Panagou.
4. *Department of Defense (US Navy)*, “RANGR, Risk-Aware Navigation and Guidance for Resilience,” DOD STTR 17.B Topic # N17B-T034, Oct. 2017 – Apr. 2018, Phase I: UMich: \$50,000, PI: Kevin McDonough (Bihrl Applied Research), UMich PI: Ella Atkins.
 5. *Office of Naval Research (ONR)*, “An Autonomous Innovator to Enhance Long-Duration Mission Success,” \$900,000, July 2013 – Apr 2018, PI: Ella Atkins, Co-PIs: Dennis Bernstein and Dawn Tilbury.
 6. *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 Technologies).
 7. *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.
 8. *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).
 9. *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.
 10. *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.
 11. *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.
 12. *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.
 13. *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.
 14. *MIT Lincoln Laboratory*, “Solar UAS Development at the University of Michigan (Phase I and II),” \$450,000, Sep. 2010 - Aug. 2012, PI: Ella Atkins.
 15. *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.
 16. *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.

17. *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.
18. *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.
19. *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.
20. *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.
21. *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).
22. *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.
23. *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.
24. *National Science Foundation (NSF)*, “REU Supplement to CAREER Project,” \$12,500, Aug. 2004 - Feb. 2005, PI: Ella Atkins.
25. *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.
26. *National Institute of Aerospace (NASA)*, “Sensor Evaluation for an Unmanned Aerial Vehicle (Rising Star Fellowship),” \$84,000, May 2004 – May 2006, PI: Ella Atkins.
27. *National Science Foundation (NSF)*, “CAREER: State-dependent Resource Management for Integrated Task and Motion Plans,” \$421,000, Feb. 2004 – Jan. 2009, PI: Ella Atkins.
28. *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.
29. *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.

30. *National Aeronautics and Space Administration (NASA)*, E. Atkins, “Efficient Optimization of Satellite Formations,” \$180,000, Nov. 2003 – Oct. 2006, PI: Ella Atkins.
31. *National Aeronautics and Space Administration (NASA)*, “TableSat Satellite Simulation Platform,” \$15,000, Nov. 2003 – Mar. 2004, Co-PIs: Ella Atkins and Rob Sanner.
32. *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.
33. *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.
34. *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.
35. *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.
36. *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).
37. *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.
38. *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.
39. *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 Science Foundation (NSF)*, “Phase II IUCRC University of Michigan: Center for Unmanned Aircraft Systems (C-UAS),” IUCRC Program, \$500,000 (plus industry membership fees), 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: BYU, University of Colorado, Virginia Tech, Georgia Tech.
2. *National Institute of Aerospace (NIA)*, “Paths to Autonomous Vehicle Operations for Urban Air Mobility,” \$275,000, Oct. 2018 – Nov. 2020, PI: Ella Atkins (\$175K); Co-PI: Nadine Sarter (\$100K). (Second year added in Oct. 2019 for Atkins only.)
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; Co-PI: Hossein Rastgoftar (Assistant Research Scientist supervised by E. Atkins).

4. *National Science Foundation (NSF)*, “A Smart Service System for UAS Traffic Management in Low-Altitude Airspace,” Partnerships for Innovation: Building Innovation Capacity (PFI:BIC), \$1,000,000 (Overall), (\$209,719 to UMich/Atkins), Sept. 2017 – Aug. 2020, PI: Peng Wei (Iowa State University), UMich PI: Ella Atkins. Investigator team also includes Thomas Schnell (University of Iowa), Kristin Rozier (Iowa State), and representatives from Mosaic and Collins Aerospace.
5. *National Science Foundation*, “A Continuum Deformation Approach to Unmanned Aircraft Traffic Management,” \$500,000, May 2019 – Apr. 2022, PI: Hossein Rastgoftar (\$450K), Co-PI: Ella Atkins (\$50K).
6. *National Science Foundation*, “National Robotics Initiative (NRI) PI Meeting 2020 Technical Program Organization,” \$39,771, Sep. 2019 – Aug. 2020, PI: Ella Atkins, Co-PIs: Odest Jenkins, Kathryn Skinner.
7. *Army Research Office*, “OSCAR: Outdoor Scientific Center for Autonomy and Robotics” (equipment proposal), \$250,000 (+\$20K CoE cost share), PI: Atkins (plus a number of Co-PIs) (awarded April 2020 for equipment purchase).
8. *Kahn Foundation*, “Michigan-Israel Partnership for Research: Mega Project 2: Autonomous Systems,” Co-PI Atkins budget: \$416,667, Sep. 2019 – Dec. 2022.
9. *Collins Aerospace*, “UAS Traffic Management (UTM) Geofencing 2020: Airspace Volume Management,” \$100,000, May 2020 – Dec. 2020, PI: Ella Atkins.
10. *M-Cubed (University of Michigan)*, “The Fat Forest Falcon Tree-Sampling Drone,” \$60,000, PIs (3): Gabriel Arellano (Ecology & Evolutionary Biology), Ella Atkins (Aerospace and Robotics), Brent Gillespie (ME and Robotics), May 2020 – December 2020 (we are asking for an extension to enable field activities in 2021; tree sampling field tests are impossible in Summer 2020 due to COVID-19).

c.3 Pending grants and contracts

1. *National Science Foundation*, “CPS: Frontier: Collaborative Research: Cyber-Physical Foundations for Safe Urban Air Mobility,” Cyberphysical Systems (CPS) Program (CISE), PI: Ella Atkins, total budget: \$3,547,093, PI Atkins’ share: ~\$800,000, Co-PIs: Alex Gorodetsky, Jean-Baptiste Jeannin, Baris Kasikci, Nadine Sarter, with UT-Arlington, University of Colorado (submitted September 2019).
2. *National Science Foundation*, “NRI: FND: Aerial Manipulation in Human-Robot Collaborative Roofing,” \$500,000, PI: Atkins, Sept. 2020 – Aug. 2023.

c.4 Publications and scholarly presentations

c.4.1 Full articles in refereed publications

1. Y. Yao and E. Atkins, “The Smart Black Box: A Value-Driven High-Bandwidth Automotive Event Data Recorder,” *IEEE Transactions on Intelligent Transportation Systems*, February 2020, doi: [10.1109/TITS.2020.2971385](https://doi.org/10.1109/TITS.2020.2971385).
2. M. Stevens and E. Atkins, “Generating Airspace Geofence Boundary Layers in Wind,” *Journal of Aerospace Information Systems*, AIAA, Vol. 17, No., 2, February 2020, doi: 10.2514/1.I010792.

3. H. Rastgoftar and E. Atkins, "Physics-Based Freely Scalable Continuum Deformation for UAS Traffic Coordination," *Transactions on Control of Network Systems (TCNS)*, IEEE, accepted (November 2019), doi: 10.1109/TCNS.2019.2954521.
4. P. Sharma and E. Atkins, "An Experimental Investigation of Tractor and Pusher Hexacopter Performance," *Journal of Aircraft*, AIAA, Vol. 56, No. 5, pp. 1920-1934, Sept. 2019, doi: 10.2514/1.C035319.
5. H. Rastgoftar and E. Atkins, "Safe Multi-Cluster UAV Continuum Deformation Coordination," *Aerospace Science and Technology*, Vol. 91, pp. 640-655, Aug. 2019.
6. H. Rastgoftar, E. Atkins, and D. Panagou, "Safe Multi-Quadcopter System Continuum Deformation over Moving Frames," *Transactions on Control of Network Systems*, IEEE, Vol. 6, No. 2, pp. 737-749, October 2018, doi: 10.1109/TCNS.2018.2873204.
7. M. Stevens, H. Rastgoftar, and E. Atkins, "Geofence Boundary Violation Detection in 3D Using Triangle Weight Characterization with Adjacency," *Journal of Intelligent and Robotic Systems*, Springer, September 2018, doi: 10.1007/s10846-018-0930-5.
8. H. Rastgoftar and E. Atkins, "Cooperative Aerial Lift and Manipulation (CALM)," *Aerospace Science and Technology*, Elsevier, Vol. 82-83, pp. 105-118, November 2018, doi: 10.1016/j.ast.2018.09.005.
9. H. Rastgoftar and E. Atkins, "Cooperative Aerial Payload Transport Guided by an In Situ Human Supervisor," *Transactions on Control Systems Technology*, IEEE, Vol. 27, No. 4, pp. 1452-1467, June 2018, doi: 10.1109/TCST.2018.2832598.
10. J. Castagno and E. Atkins, "Roof Shape Classification from LiDAR and Satellite Image Data Fusion using Supervised Learning," *Sensors*, MDPI, Vol. 18, No. 11, Nov. 2018, doi: 10.3390/s18113960.
11. E. Atkins, "Aerospace Engineering Curricular Expansion in Information Systems," Book Chapter in *Advances in Aeronautical Informatics*, Springer, May 2018, doi: 10.1007/978-3-319-75058-3_10.
12. D. Asadi and E. Atkins, "Multi-Objective Weight Optimization for Trajectory Planning of an Airplane with Structural Damage," *Journal of Intelligent and Robotic Systems*, Springer, Vol. 91, No. 3-4, pp. 667-690, September 2018, doi: 10.1007/s10846-017-0753-9.
13. A. Nasir, E. Atkins, and I. Kolmanovsky, "Robust Science-Optimal Spacecraft Control for Circular Orbit Missions," *Transactions on Systems, Man, and Cybernetics: Systems*, IEEE, November 2017, doi: 10.1109/TSMC.2017.2767077.
14. E. Taheri, I. Kolmanovsky, and E. Atkins, "Shaping Low-Thrust Trajectories with Thrust-Handling Feature," *Advances in Space Research (ASR)*, Elsevier, Vol. 61, No. 3, pp. 879-890, Feb. 2018, doi: 10.1016/j.asr.2017.11.006.
15. P. Di Donato and E. Atkins, "Evaluating Risk to People and Property for Aircraft Emergency Landing Planning," *Journal of Aerospace Information Systems*, AIAA, Vol. 14, No. 5, pp. 259-278, 2017, doi: 10.2514/1.I010513.
16. H. Rastgoftar and E. Atkins, "A Graph Theoretic Based Method for Analyzing Conduction Problems," *Journal of Engineering Mathematics*, Springer, Vol. 106, No. 1, pp. 169-201, Oct. 2017, doi: 10.1007/s10665-017-9898-6.
17. 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, Vol. 18, No. 7, pp. 1980-1988, July 2017, doi: 10.1109/TITS.2016.2614350.
18. 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, Vol. 25, No. 5, pp. 1634-1643, Sept. 2017, doi: 10.1109/TCST.2016.2620062.
19. 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, Vol. 47, No. 11, pp. 3879-3891, Nov. 2017, doi: 10.1109/TCYB.2016.2587673.
 20. 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.
 21. 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, No. 4, Special Issue on Aircraft Loss of Control, pp. 817-830, 2017, doi: 10.2514/1.G001743.
 22. 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.
 23. 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, No. 2, pp. 73-91, 2017, doi: 10.2514/1.I010484.
 24. 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.
 25. 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.
 26. 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.
 27. 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.
 28. 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.
 29. 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, 15(1), Jan. 2018, doi: 10.1109/TASE.2016.2547885.
 30. 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.
 31. 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.
32. 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.
 33. J. Bradley and E. Atkins, “Optimization and Control of Cyber-Physical Vehicle Systems,” *Sensors*, MDPI, September 2015, doi: 10.3390/s150923020.
 34. 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.
 35. 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.
 36. 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.
 37. 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.
 38. 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.
 39. 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.
 40. 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.
 41. 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.
 42. 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.
 43. 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.
 44. 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.
 45. 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.

46. 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.
47. 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.
48. 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.
49. 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.
50. 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.
51. 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.
52. E. Atkins, "Aerospace Avionics Systems," *Encyclopedia of Aerospace Engineering*, Wiley & Sons, Vol. 8, Part 38, pp. 4787-4797, Dec. 2010.
53. 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.
54. 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.
55. 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.
56. W. Ren and E. Atkins, "Distributed Multi-Vehicle Coordinated Control via Local Information Exchange," *International Journal of Robust and Nonlinear Control*, Vol. 17, Issue 10-11, pp. 1002-1033, July 2007, doi: 10.1002/rnc.1147.
57. W. Ren, R. Beard, and E. Atkins, "Information Consensus in Multivehicle Cooperative Control" *Control Systems Magazine*, IEEE, Vol. 27, No. 2, April 2007, pp. 71-82, doi: 10.1109/MCS.2007.338264.
58. A. Hoskins and E. Atkins, "Satellite Formation Mission Optimization with a Multi-Impulse Design," *Journal of Spacecraft and Rockets*, AIAA, Vol. 44, No. 2, pp. 425-433, March-April 2007, doi: 10.2514/1.19984.
59. T. Wasserman,* J. Lennon, and E. Atkins, "A Modal Operations Paradigm for Robust Vision-based Astronaut Following", *Journal of Aerospace Computing, Information, and Communication*, AIAA, Vol. 3, No. 12, pp. 603-618, December 2006, doi: 10.2514/1.20201.

60. E. Atkins, I. Alonso-Portillo, and M. Strube, "Emergency Flight Planning applied to Total Loss of Thrust," *Journal of Aircraft*, AIAA, Vol. 43, No. 4, pp. 1205-1216, Jul-Aug 2006, doi: 10.2514/1.18816.
61. J. Smithanik, E. Atkins, and R. Sanner, "A Visual Positioning System for an Underwater Space Simulation Environment," *Journal of Guidance, Control, and Dynamics*, AIAA, Vol. 29, No. 4, pp. 858-869, July 2006, doi: 10.2514/1.16157.
62. M. Xue and E. Atkins, "Noise-Minimum Runway-Independent Aircraft Approach Design for Baltimore-Washington International Airport," *Journal of Aircraft*, AIAA, Vol. 43, No. 1, pp. 39-51, Jan-Feb 2006, doi: 10.2514/1.15692.
63. D. Chavez-Clemente and E. Atkins, "Optimization of Tetrahedral Satellite Formations," *Journal of Spacecraft and Rockets*, AIAA, Vol. 42, No. 5, pp. 699-710, July-August 2005, doi: 10.2514/1.9776.
64. J. Lennon and E. Atkins, "Multi-Objective Spacecraft Trajectory Optimization with Synthetic Agent Oversight," *Journal of Aerospace Computing, Information, and Communication*, AIAA, Vol. 2, No. 1, pp. 4-24, January 2005, doi: 10.2514/1.12922.
65. S. Roderick, B. Roberts, E. Atkins, P. Churchill, and D. Akin, "An Autonomous Software Safety System for a Dexterous Space Robot," *Journal of Aerospace Computing, Information, and Communication*, AIAA, Vol. 1, No. 12, pp. 564-579, December 2004, doi: 10.2514/1.12916.
66. S. Roderick, B. Roberts, E. Atkins, and D. Akin, "The Ranger Robotic Satellite Servicer and its Autonomous Software-based Safety System," *IEEE Intelligent Systems*, IEEE, Vol. 19, No. 5, pp. 13-20, Sept/Oct 2004, doi: 10.1109/MIS.2004.53.
67. E. Atkins and M. Xue, "Noise Sensitive Final Approach Trajectory Optimization for Runway-Independent Aircraft," *Journal of Aerospace Computing, Information, and Communication*, AIAA, Vol. 1, No. 7, pp. 269-287, July 2004, doi: 10.2514/1.3924.
68. E. Atkins, T. Abdelzaher, K. Shin, and E. Durfee, "Planning and Resource Allocation for Hard Real-time, Fault-Tolerant Plan Execution," *Journal of Autonomous Agents and Multi-Agent Systems*, Vol. 4, No. 1/2, pp. 57-78, March/June 2001, doi: 10.1023/A:1010066729351.
69. T. Abdelzaher, E. Atkins, and K. Shin, "QoS Negotiation in Real-Time Systems and Its Application to Automated Flight Control," *Transactions on Computers*, IEEE, Vol. 49, No. 11, pp. 1170-1183, November 2000, doi: 10.1109/12.895935.

c.4.2 Shorter communications, letters or notes or briefs in refereed publications

1. E. Atkins, "Journal of Aerospace Information Systems Year-End Review," Editorial, *Journal of Information Systems (JAIS)*, Vol. 17, No. 1, Jan. 2020.
2. E. Atkins, "Journal of Aerospace Information Systems Year-End Review," Editorial, *Journal of Information Systems (JAIS)*, Vol. 16, No. 1, Jan. 2019.
3. E. Atkins, "Shepherding in a New Era of Integrated Aerospace Information Systems," Editorial, *Journal of Information Systems (JAIS)*, Vol. 15, No. 2, pp. 37-37, Feb. 2018, doi: 10.2514/1.I010642.
4. A. Nasir, E. Atkins, and I. Kolmanovsky, "Mission-Based Fault Reconfiguration for Spacecraft Applications," *Journal of Aerospace Information Systems*, AIAA, Vol. 10, No. 11, pp. 512-515, November 2013, doi: 10.2514/1.I010100 (technical note).

5. K. Cohen, F. Figueroa, E. Atkins, M. Ingham, R. Doyle, S. Garg, I. Gregory, S. Obayashi, N. Nguyen, L. Blackmore, W. Truszkowski, "Introduction: Enhancing Intelligence in Aerospace Systems," *Journal of Aerospace Computing, Information, and Communication (JACIC)*, AIAA, vol. 6, no. 3, pp. 121-122, March 2009 (special issue introduction).
6. AIAA Intelligent Systems Technical Committee (E. Atkins, member and co-author), "Intelligence in Aerospace Systems", *Journal of Aerospace Computing, Information, and Communication*, vol. 1, no. 12, pp. 484-485, Dec. 2004 (special issue).

c.4.3 Refereed conference or symposium proceedings papers

1. Y. Yao, M. Xu, Y. Wang, D. Crandall, and E. Atkins, "Unsupervised Traffic Accident Detection in First-Person Videos," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macao, China, Nov. 2019 (highly refereed).
2. A. Mathur, K. Panesar, J. Kim, E. Atkins, N. Sarter, "Paths to Autonomous Vehicle Operations for Urban Air Mobility," *AIAA Aviation Conference*, June 2019.
3. Z. Liang, H. Rastgoftar, and E. Atkins, "Multi-Quadcopter Team Leader Path Planning using Particle Swarm Optimization," *AIAA Aviation Conference*, June 2019.
4. M. Romano, P. Kuevor, D. Lukacs, O. Marshall, M. Stevens, H. Rastgoftar, J. Cutler, and E. Atkins, "Experimental Evaluation of Continuum Deformation with a Five Quadrotor Team," *American Control Conference (ACC)*, July 2019.
5. H. Rastgoftar, J.-B. Jeannin, and E. Atkins, "Formal Specification of Continuum Deformation Coordination," *American Control Conference (ACC)*, July 2019.
6. Y. Yao, M. Xu, C. Choi, D. Crandall, E. Atkins, and B. Dariush, "Egocentric Vision-based Future Vehicle Localization for Intelligent Driving Assistance," *International Conference on Robotics and Automation (ICRA)*, May 2019.
7. H. Rastgoftar and E. Atkins, "Multi-UAV Continuum Deformation Flight Optimization in Cluttered Urban Environments," *AIAA Scitech Conference*, San Diego, CA, January 2019.
8. P. Sharma, C. Ochoa, and E. Atkins, "Sensor Constrained Flight Envelope for Urban Air Mobility," *AIAA Scitech Conference*, San Diego, CA, January 2019.
9. Y. Yao and E. Atkins, "The Smart Black Box: A Value-Driven Automotive Event Data Recorder," *International Conference on Intelligent Transportation Systems (ITSC)*, IEEE, Maui, HI, November 2018.
10. H. Rastgoftar, B. Zhang, and E. Atkins, "A Data-Driven Approach for Autonomous Motion Planning and Control in Off-Road Driving Scenarios," *American Control Conference (ACC)*, IEEE, June 2018.
11. C. Ochoa, K. Meuche, and E. Atkins, "Multicopter Operations for Autonomous Assembly Applications in Manufacturing Environments," *AIAA Aviation and Aeronautics Forum*, Atlanta, GA, June 2018.
12. P. Sharma and E. Atkins, "An Experimental Investigation of Tractor and Pusher Hexacopter Performance," *AIAA Aviation and Aeronautics Forum*, Atlanta, GA, June 2018. [[Winner of the Best Student Paper Award for Atmospheric Flight Mechanics.](#)]
13. M. Stevens and E. Atkins, "Layered Geofences in Complex Dynamic Airspace Environments," *AIAA Aviation and Aeronautics Forum*, Atlanta, GA, June 2018.
14. J. Castagno and E. Atkins, "Automatic Classification of Roof Shapes for Multicopter Emergency Landing Site Selection," *AIAA Aviation and Aeronautics Forum*, Atlanta, GA, June 2018.

15. J. Castagno, C. Ochoa, and E. Atkins, "Comprehensive Risk-based Planning for Small Unmanned Aircraft System Rooftop Landing," *International Conference on Unmanned Aircraft Systems (ICUAS)*, Dallas, TX, June 2018.
16. H. Rastgoftar and E. Atkins, "Continuum Deformation of a Multiple Quadcopter Payload Delivery Team without Inter-Agent Communication," *International Conference on Unmanned Aircraft Systems (ICUAS)*, Dallas, TX, June 2018.
17. K. McDonough, J. Castagno, J. Player, and E. Atkins, "Assessing Risk of UAS Operations to People and Property," *AUVSI Xponential Technical Paper Session*, Denver, CO, May 2018.
18. Z. Renwick, D. Tilbury, and E. Atkins, "A Reinforcement Learning Based Adaptive Supervisor for Multiple Model Adaptive Estimation and Control," In *2018 IEEE International Conference on Electro/Information Technology (EIT)* (pp. 0216-0221). IEEE, May 2018, doi: 10.1109/EIT.2018.8500247.
19. M. Stevens and E. Atkins, "Geofencing in Immediate Reaches Airspace for Unmanned Aircraft System Traffic Management," *Infotech@Aerospace at Scitech*, AIAA, January 2018, doi: 10.2514/6.2018-2140.
20. E. Taheri, E. Atkins, and I. Kolmanovsky, "Performance Comparison of Smoothing Functions for Indirect Optimization of Minimum-Fuel Low-Thrust Trajectories," *Space Flight Mechanics Meeting at Scitech*, AIAA, January 2018, doi: 10.2514/6.2018-0214.
21. M. Stevens, H. Rastgoftar, and E. Atkins, "Specification and Evaluation of Geofence Boundary Violation Detection Algorithms," *International Conference on Unmanned Aircraft Systems (ICUAS)*, Miami, FL, June 2017, doi: 10.1109/ICUAS.2017.7991472.
22. J. Holper, K. Henry, and E. Atkins, "Cyber-Physical Thermal Modeling for a Small UAS," *International Conference on Unmanned Aircraft Systems (ICUAS)*, Miami, FL, June 2017, doi: 10.1109/ICUAS.2017.7991491.
23. P. Di Donato and E. Atkins, "Three-Dimensional Dubins Path Generation and Following for a UAS Glider," *International Conference on Unmanned Aircraft Systems (ICUAS)*, Miami, FL, June 2017, doi: 10.1109/ICUAS.2017.7991505.
24. H. Rastgoftar, E. Taheri, A. Ghasemi, E. Atkins, and A. Girard, "Continuum Deformation of a Multi-Quadcopter System in a Payload Delivery Mission," *Proc. IFAC World Congress*, Toulouse, France, July 2017, doi: 10.1016/j.ifacol.2017.08.847.
25. H. Rastgoftar and E. Atkins, "Unmanned Vehicle Mission Planning Given Limited Sensory Information," *Proc. American Control Conference*, Seattle, WA, May 2017, doi: 10.23919/ACC.2017.7963644.
26. P. Di Donato, P. Gaskell, and E. Atkins, "Small Unmanned Aircraft Systems for Project-Based Engineering Education," *Infotech@Aerospace at Scitech*, AIAA, Grapevine, TX, 2017, doi: 10.2514/6.2017-1377.
27. C. Ochoa and E. Atkins, "Fail-Safe Navigation for Autonomous Urban Multicopter Flight," *Infotech@Aerospace at Scitech*, AIAA, Grapevine, TX, 2017, doi: 10.2514/6.2017-0222.
28. H. Rastgoftar, X. Ni, and E. Atkins, "Nonlinear System Finite-Time Output Reachability for Flight Control given Uncertain Airspeed," *Guidance, Navigation, and Control (GNC) at Scitech*, AIAA, Grapevine, TX, 2017, doi: 10.2514/6.2017-1515.
29. H. Rastgoftar and E. Atkins, "Deployment of an Arbitrary Distribution of a Multi Agent System with Finite Size on a Desired Formation," *Proceedings of the Dynamic Systems and Control Conference (DSCC)*, ASME, Minneapolis, MN, 2016, doi: 10.1115/DSCC2016-9752.

30. H. Rastgoftar, X. Ni and E. Atkins, "Autonomous Collision Avoidance as a Markov Decision Process" *ASME Dynamic Systems and Control Conference*, Minneapolis, MN, 2016, doi: 10.1115/DSCC2016-9790.
31. B. Coloe and E. Atkins, "Cyber-Physical Optimization of an Unmanned Aircraft System with Thermal Consideration," *American Control Conference (ACC)*, Boston, MA, 2016, doi: 10.1109/ACC.2016.7525109.
32. Z. Li, H. Ossareh, I. Kolmanovsky, E. Atkins, and J. Lu, "Control Design of Semi-active Suspension Systems using a Quasi-Linear Control Approach," *American Control Conference (ACC)*, Boston, MA, July 2016, doi: 10.1109/ACC.2016.7525276.
33. Z. Li, U. Kalavic, I. Kolmanovsky, E. Atkins, J. Lu, D. Filev, "Simultaneous Road Profile Estimation and Anomaly Detection with an Input Observer and a Jump Diffusion Process Estimator," *American Control Conference (ACC)*, Boston, MA, July 2016, doi: 10.1109/ACC.2016.7525160.
34. M. Stevens and E. Atkins, "Multi-Mode Guidance for an Independent Multicopter Geofencing System", *AIAA Aviation Conference*, AIAA, Washington, DC, June 2016, doi: 10.2514/6.2016-3150.
35. S. Balachandran and E. Atkins, "An Autonomous Override System to Prevent Airborne Loss of Control", 2016 *Innovative Applications of Artificial Intelligence (IAAI)*, AAAI, Phoenix, AZ, Feb. 2016. (strictly reviewed)
36. S. Balachandran and E. Atkins, "Flight Safety Assessment and Management to Prevent Loss of Control Due to In-Flight Icing," *Guidance, Navigation, and Control Conference at Scitech*, AIAA, Jan. 2016, doi: 10.2514/6.2016-0094.
37. P. Donato and E. Atkins, "Exploring Non-Aviation Information Sources for Aircraft Emergency Landing Planning," *Infotech@Aerospace Conference at Scitech*, AIAA, Jan. 2016, doi: 10.2514/6.2016-1904.
38. Z. Li, X. Yin, I. Kolmanovsky, J. Lu, D. Filev, and E. Atkins, "Robust H-infinity Control for a Class of Networked Uncertain Systems with Multiple Channels Subject to Markovian Switching," *IEEE Conference on Decision & Control (CDC)*, IEEE, Dec. 2015.
39. Z. Li, I. Kolmanovsky, E. Atkins, J. Lu, D. Filev, "H-infinity Filtering for Cloud-Aided Semi-active Suspension with Delayed Road Information," *Proc. IFAC*, Vol. 48, Issue 12, 2015, doi: 10.1016/j.ifacol.2015.09.390.
40. Z. Li, I. Kolmanovsky, E. Atkins, J. Lu, D. Filev, "Road Anomaly Estimation: Model Based Pothole Detection," *American Control Conference (ACC)*, June 2015.
41. M. Stevens, B. Coloe, and E. Atkins, "Platform Independent Geofencing for Low Altitude UAS Operations," *AIAA Aviation Conference*, AIAA, June 2015, doi: 10.2514/6.2016-3150.
42. P. Di Donato and E. Atkins, "An Emergency Off-Runway Landing Aid for a Small Airplane Subject to Loss of Thrust," *Infotech@Aerospace at SciTech*, AIAA, Jan. 2015, doi: 10.2514/6.2015-1798.
43. D. Yeo, E. Shrestha, D. Paley, and E. Atkins, "An Empirical Model of Rotorcraft UAV Downwash for Real-Time Disturbance Localization and Avoidance," *Atmospheric Flight Mechanics Conference at SciTech*, AIAA, Jan. 2015, doi: 10.2514/6.2015-1685.

44. S. Balachandran and E. Atkins, "A Constrained Markov Decision Process Framework for Flight Safety Assessment and Management," *Infotech@Aerospace at SciTech*, AIAA, Jan. 2015, AIAA, doi: 10.2514/6.2015-0115. [*Awarded Best Intelligent Systems Student Paper, Jan. 6, 2015.*]
45. J. Rufa and E. Atkins, "Sensor Selection and Fusion for Unmanned Aircraft System Navigation in an Urban Environment," *American Control Conference (ACC)*, Portland, OR, June 2014.
46. I. Olson,* A. Ten Harmsel,* and E. Atkins, "Safe Landing Planning for an Energy-Constrained Multicopter," *International Conference on Unmanned Aircraft Systems (ICUAS)*, Orlando, FL, May 27-30, 2014.
47. E. Atkins, "Autonomy as an Enabler of Economically-Viable Beyond-Line-of-Sight Low-Altitude UAS Applications with Acceptable Risk," *AUVSI North American Conference*, Association for Unmanned Vehicle Systems International (www.auvsi.org), Orlando, FL, May 12-15, 2014.
48. Z. Pang, C. Cesnik, and E. Atkins, "In-Flight Wing Deformation Measurement System for Small Unmanned Aerial Vehicles," *SciTech 2014*, AIAA, Baltimore, MD, January 13-16, 2014.
49. K. McDonough, I. Kolmanovsky, and E. Atkins, "Recoverable sets of initial conditions and their use for aircraft flight planning after a loss of control event," *Guidance, Navigation, and Control Conference at SciTech 2014*, AIAA, Baltimore, MD, January 13-16, 2014.
50. S. Balachandran and E. Atkins, "An Evaluation of Flight Safety Assessment and Management to avoid Loss of Control during Takeoff," *Guidance, Navigation, and Control Conference at SciTech 2014*, AIAA, Baltimore, MD, January 13-16, 2014.
51. I. Olson and E. Atkins, "Qualitative Failure Analysis for a Small Quadrotor Unmanned Aircraft System," *Guidance, Navigation, and Control Conference*, AIAA, August 2013.
52. J. Bradley, M. Clark, E. Atkins, and K. Shin, "Mission-Aware Cyber-Physical Optimization on a Tabletop Satellite," *Infotech@Aerospace Conference*, AIAA, August 2013.
53. J. Rufa and E. Atkins, "OTDOA/GPS Fusion for Urban UAS Navigation using Particle Filtering Techniques," *Guidance, Navigation, and Control Conference*, AIAA, August 2013.
54. S. Balachandran and E. Atkins, "Flight Safety Assessment and Management during Takeoff," *Infotech@Aerospace Conference*, AIAA, August 2013.
55. M.-J. Yu, E. Atkins, I. Kolmanovsky, and D. Bernstein, "Trim-Commanded Adaptive Control for Waypoint-Defined Trajectory Following," *Guidance, Navigation, and Control Conference*, AIAA, August 2013.
56. M.-J. Yu, Y. Rahman, E. Atkins, I. Kolmanovsky, and D. Bernstein, "Minimal Modeling Adaptive Control of the NASA Generic Transport Model with Unknown Control Surface Faults," *Guidance, Navigation, and Control Conference (Invited)*, AIAA, August 2013.
57. D. Yeo, E. Atkins, L. Bernal, and W. Shyy, "Experimental Characterization of an Aerodynamic Sensing Scheme for Post-Stall Aerodynamic Moment Characterization," *Atmospheric Flight Mechanics Conference*, AIAA, August 2013.

58. E. Atkins and J. Bradley, "Aerospace Cyber-Physical Systems Education," *Infotech@Aerospace Conference*, AIAA, August 2013.
59. J. Broderick, D. Tilbury, and E. Atkins, "Supervisory Traction Control for a Slipping UGV," *American Control Conference (ACC)*, June 2013.
60. E. Atkins, "Education in the Cross-Cutting Sciences of Aerospace and Computing," *Aerospace Sciences Meeting (invited paper)*, AIAA, Dallas, TX, January 2013.
61. C. McGhan and E. Atkins, "Towards Guaranteeing Safe and Efficient Human-Robot Collaboration Using Human Intent Prediction", *Space 2012 Conference*, AIAA, Pasadena, CA, Sept. 11-13 2012.
62. Y. Li and E. Atkins, "A Vision-based Tracking System for Perpetual Flight with Natural Lighting," *Proc. AIAA Guidance, Navigation, and Control Conference*, August 2012.
63. J. Broderick, D. Tilbury, and E. Atkins, "Maximizing coverage for mobile robots while conserving energy," *Proceedings of the ASME 2012 IDETC/CIE*, August 2012.
64. J. Bradley and E. Atkins, "Multi-Disciplinary Cyber-Physical Optimization for Unmanned Aircraft Systems," *Infotech@Aerospace*, AIAA, Garden Grove, CA, June 2012.
65. C. McGhan, A. Nasir, and E. Atkins, "Human Intent Prediction Using Markov Decision Processes," *Infotech@Aerospace*, AIAA, Garden Grove, CA, June 2012.
66. A. Nasir, E. Atkins, I. Kolmanovsky, "A Mission Based Fault Reconfiguration Framework for Spacecraft Applications," *Infotech@Aerospace*, AIAA, Garden Grove, CA, June 2012.
67. A. Klesh, J. Cutler, and E. Atkins, "Cyber-Physical Challenges for Space Systems," *Proceedings of the International Conference on Cyber-Physical Systems (ICCP)*, IEEE, Beijing, April 2012. **(highly reviewed)**
68. J. Broderick, D. Tilbury, and E. Atkins, "Energy usage for UGVs executing coverage tasks," *Proc. SPIE 8387*, April 2012.
69. D. Yeo, E. Atkins, L. Bernal, W. Shyy, "Experimental Investigation of the Force, Torque and Pressure Characteristics of a Rigid Flapping Wing," *Aerospace Sciences Meeting (ASM)*, AIAA, Nashville, TN, Jan. 2012.
70. E. Atkins, "Intelligent Systems for Unmanned Aircraft Safety Certification," *Aerospace Sciences Meeting (ASM)*, AIAA, Nashville, TN, Jan. 2012.
71. J. Richardson, E. Atkins, P. Kabamba, A. Girard, "Stationary Flight and Guaranteeing Airplane Controllability when Facing Stochastic Wind Gusts," *Atmospheric Flight Mechanics Conference (AFM)*, AIAA, Portland, OR, August 2011.
72. D. Yeo, E. Atkins, and W. Shyy, "Test-Analysis Correlation of Flapping Wing Aerodynamics," *Atmospheric Flight Mechanics Conference (AFM)*, AIAA, Portland, OR, August 2011.
73. A. Nasir, E. Atkins, and I. Kolmanovsky, "Science Optimal Spacecraft Attitude Maneuvering while Accounting for Failure Modes," *IFAC World Congress*, Milano, Italy, August 2011.

74. J. Bradley and E. Atkins, "Computational-Physical State Co-Regulation in Cyber-Physical Systems," *Proceedings of the International Conference on Cyber-Physical Systems (ICCPs)*, Chicago, IL, April 2011. **(highly reviewed)**
75. A. Nasir, E. Atkins, and I. Kolmanovsky, "A Conflict Resolution Algorithm for Fault Detection and Diagnosis," *Infotech@Aerospace*, AIAA, March 2011.
76. E. Atkins, "A Project-based Undergraduate Aerospace Sequence, with Embedded Computational Intelligence," *Infotech@Aerospace*, AIAA, St. Louis, March 2011.
77. R. Eubank and E. Atkins, "Unattended Autonomous Mission and System Management of an Unmanned Seaplane," *Infotech@Aerospace*, AIAA, St. Louis, March 2011.
78. D. Yeo, E. Atkins, and W. Shyy, "Aerodynamics Sensing as Feedback for Ornithopter Flight Control," *Aerospace Sciences Meeting (ASM)*, AIAA, Orlando, FL, January 2011.
79. R. Eubank, E. Atkins, and G. Meadows, "Unattended Operation of an Autonomous Seaplane for Persistent Surface and Airborne Ocean Monitoring," *OCEANS*, Sept. 2010.
80. R. Eubank, E. Atkins, and S. Ogura,* "Fault Detection and Fail-Safe Operation with a Multiple-Redundancy Air-Data System," *Guidance, Navigation, and Control Conference*, AIAA, Toronto, ON, August 2010.
81. A. Nasir and E. Atkins, "Fault Tolerance for Spacecraft Attitude Management," *Guidance, Navigation, and Control Conference*, AIAA, Toronto, ON, August 2010.
82. H. Choi and E. Atkins, "Smooth Transitions for a Turning Dubins Vehicle," *Guidance, Navigation, and Control Conference*, AIAA, Toronto, ON, August 2010.
83. E. Atkins, "Metrics for Equitable UAS Operations in Mixed-Use Airspace," *Unmanned Systems North America*, AUVSI, Denver, CO, August 2010.
84. R. Eubank and E. Atkins, "Energy-Aware Flight Management of the Flying Fish Solar-Powered Autonomous Seaplane", *Unmanned Systems North America*, AUVSI, August 2010, Denver, CO, August 2010.
85. H. Choi, E. Atkins, and G. Yi, "Flight Envelope Discovery for Damage Resilience with Application to an F16," *Infotech@Aerospace Conference*, AIAA, Atlanta, GA, April 2010.
86. E. Atkins, "Emergency Landing Automation Aids: An Evaluation Inspired by US Airways Flight 1549," *Infotech@Aerospace Conference*, AIAA, Atlanta, GA, April 2010.
87. C. McGhan and E. Atkins, "A Low-Cost Manipulator for Space Research and Undergraduate Engineering Education", *Infotech@Aerospace Conference*, AIAA, Atlanta, GA, April 2010.
88. C. Cesnik, P. Senatore, W. Su, E. Atkins, C. Shearer, and N. Pitcher, "X-HALE: A Very Flexible UAV for Nonlinear Aeroelastic Tests," *Structures, Structural Dynamics, and Materials Conference*, AIAA, Apr. 2010 (best paper).
89. G. Yi and E. Atkins, "Trim State Discovery for an Adaptive Flight Planner," *Aerospace Sciences Meeting*, AIAA, Orlando, FL, Jan 2010.

90. E. Atkins, A. Khalsa,* and M. Groden,* “Commercial Low-Altitude UAS Operations in Population Centers,” *Aircraft Technology, Integration, and Operations Conference*, AIAA, Sep. 2009.
91. D. Yeo, J. Henderson,* and E. Atkins, “An Aerodynamic Data System for Small Hovering Fixed-Wing UAS,” *Guidance, Navigation, and Control Conference*, AIAA, Chicago, IL, Aug. 2009.
92. E. Atkins, J. Green,* J. Yi, H. Wu, J. Browne, A. Mok, and F. Xie, “The TableSat Platform and its Verifiable Control Software,” *Infotech@Aerospace Conference*, AIAA, Seattle, WA, Apr. 6-9, 2009 (AIAA-2009-2021).
93. H. Choi and E. Atkins, “An Analytic Trajectory Planner for Aircraft with Severe Damage or Failures,” *Infotech@Aerospace Conference*, AIAA, Seattle, WA, Apr. 6-9, 2009 (AIAA-2009-2018).
94. C. McGhan and E. Atkins, “Physically-Proximal Human-Robot Collaboration: Enhancing Safety and Efficiency through Intent Prediction,” *Infotech@Aerospace Conference*, AIAA, Seattle, WA, Apr. 6-9, 2009 (AIAA-2009-1950).
95. G. Meadows, E. Atkins, L. Bernal, P. Washabaugh, B. Gilchrist, L. Meadows, D. Smith, H. VanSumeren, D. Macy, R. Eubank, B. Smith, J. Brown, “The Flying Fish Persistent Ocean Surveillance Platform,” *Unmanned Unlimited Conference*, AIAA, Seattle, WA, Apr. 6-9, 2009 (AIAA-2009-1902).
96. R. Eubank, E. Atkins, and D. Macy, “Autonomous Guidance and Control of the Flying Fish Ocean Surveillance Platform,” *Infotech@Aerospace Conference*, AIAA, Seattle, WA, Apr. 6-9, 2009 (AIAA-2009-2021).
97. E. Atkins, R. Eubank, and A. Klesh, “A Reconfigurable Flight Management System for Small-Scale Unmanned Air Systems,” *Infotech@Aerospace Conference*, AIAA, Seattle, WA, Apr. 6-9, 2009 (AIAA-2009-1893).
98. E. Atkins, “Driver Override for Safety-Critical Vehicles and Networks,” *SAE World Congress, Safety-Critical Systems Track*, Detroit Michigan, April 2009.
99. S. Hong and E. Atkins, “Moving Sensor Video Image Processing enhanced with Elimination of Ego Motion by Global Registration and SIFT,” *20th Intl. Conf. on Tools with Artificial Intelligence*, IEEE, Dayton, OH, Nov. 2008.
100. D. Macy, R. Eubank, E. Atkins, L. Bernal, P. Washabaugh, G. Meadows, N. Wild, D. Smith, and H. VanSumeren, “Flying Fish: A Persistent Ocean Surveillance Buoy with Autonomous Aerial Repositioning,” *AUVSI North America*, June 2008.
101. H. Woo, J. Yi, J. Browne, A. Mok, F. Xie, E. Atkins, C.-G. Lee, “Incorporating Resource Safety Verification to Executable Model-based Development for Embedded Systems,” *Real-time Application Symposium (RTAS)*, IEEE, St. Louis, MO, April 2008. (highly reviewed)
102. H. Woo, J. Yi, J. Browne, A. Mok, E. Atkins, F. Xie, “Design and Development Methodology for Resilient Cyber-Physical Systems,” *First International Workshop on Cyber-Physical Systems (WCPS2008)*, Beijing, China, June 20, 2008.
103. D. Macy, R. Eubank, E. Atkins, L. Bernal, P. Washabaugh, G. Meadows, N. Wild, D. Smith, and H. Van Sumeren, “Flying Fish: A Persistent Ocean Surveillance Buoy with Autonomous Aerial Repositioning,” *Proc. AUVSI Conference*, June 2008.

104. E. Atkins, "Physically-Proximal Human-Robot Collaboration for Air and Space Applications," *Proc. Performance Metrics for Intelligent Systems (PerMIS) Workshop*, NIST, Gaithersburg, MD, August 2007.
105. M. Naylor, E. Atkins, and S. Roderick, "Visual Target Recognition and Tracking for Autonomous Manipulation Tasks," *Proc. Guidance, Navigation, and Control Conference*, AIAA, Hilton Head, SC, Aug. 2007.
106. Y. Tang, E. Atkins, and R. Sanner, "Emergency Flight Planning for a Generalized Transport Aircraft with Left Wing Damage," *Proc. Guidance, Navigation, and Control Conference*, AIAA, Hilton Head, SC, Aug. 2007.
107. C. McGhan and E. Atkins, "A Virtual Rover Interface for Collaborative Human-Robot Exploration Teams," *Proc. Infotech@Aerospace Conference*, AIAA, Rohnert Park, CA, May 2007.
108. M. Ransan and E. Atkins, "Human-Robot Team Task Scheduling for Planetary Surface Missions," *Proc. Infotech@Aerospace Conference*, AIAA, Rohnert Park, CA, May 2007.
109. J. Lennon and E. Atkins, "Preference-Based Trajectory Planning," *Proc. Infotech@Aerospace Conference*, AIAA, Rohnert Park, CA, May 2007.
110. G. Moylan and E. Atkins, "Research Trends in Autonomous Space-based Planning and Scheduling," *International Workshop on Planning and Scheduling for Space*, Space Telescope Science Institute, Baltimore, Maryland, October 2006.
111. C. McGhan, R. Besser,* R. Sanner, and E. Atkins, "Semi-Autonomous Inspection with a Neutral Buoyancy Free-Flyer," *Proc. AIAA Guidance, Navigation, and Control Conference and Exhibit*, Keystone, Colorado, August 2006. (AIAA-2006-6800)
112. A. Hoskins and E. Atkins, "Satellite Formation Design with a Multi-Objective Optimization Technique," *AIAA/AAS Astrodynamics Specialist Conference and Exhibit*, Keystone, Colorado, August 2006. (AIAA-2006-6013)
113. E. Atkins, G. Moylan, and A. Hoskins, "Space-Based Assembly with Symbolic and Continuous Planning Experts," *Proc. IEEE Aerospace Conference*, Big Sky, MT, March 2006.
114. M. Xue and E. Atkins, "Terminal Area Trajectory Optimization using Simulated Annealing", in *Proc. AIAA Aerospace Sciences Meeting*, Reno, NV, January 2006.
115. A. Hoskins and E. Atkins, "Formation Attitude Optimization with a Multi-Impulse Design," in *Proc. GSFC Flight Mechanics Symposium*, Greenbelt, MD, Oct. 2005.
116. J. Lennon and E. Atkins, "Intelligent Weight Selection for Trajectory Optimization," in *Proc. AIAA Infotech@Aerospace Conference*, Crystal City, VA, Sept. 2005.
117. E. Atkins and G. Moylan, "Blocks in Space: Intelligent Self-Assembly Using Optimal Control Trajectory Planning," in *Proc. AIAA Infotech@Aerospace Conference*, Crystal City, VA, Sept. 2005.
118. T. Wasserman,* J. Lennon, and E. Atkins, "Robust Vision-Based Astronaut Following for Planetary Exploration," in *Proc. AIAA Infotech@Aerospace Conference*, Crystal City, VA, Sept. 2005.
119. M. Naylor, N. Scott, E. Atkins, and S. Roderick, "Toward Autonomous Sampling and Servicing with the Ranger Dexterous Manipulator," in *Proc. AIAA Infotech@Aerospace Conference*, Crystal City, VA, Sept. 2005.

120. J. Smith, E. Valente,* R. Eubank, and E. Atkins, "A Low-Cost Research Autopilot for System Identification," in *Proc. AIAA Infotech@Aerospace Conference*, Crystal City, VA, Sept. 2005.
121. W. Ren and E. Atkins, "Coordination of Multiple Micro-Air Vehicles Using Consensus Schemes," in *Proc. AIAA Infotech@Aerospace Conference*, Crystal City, VA, Sept. 2005.
122. W. Ren and E. Atkins, "Second-order Consensus Protocols in Multiple Vehicle Systems with Local Interactions," in *Proc. AIAA Guidance, Navigation, and Control Conference*, San Francisco, CA, August 2005.
123. W. Ren and E. Atkins, "Nonlinear Trajectory Tracking for Fixed Wing UAVs via Backstepping and Parameter Adaptation," in *Proc. AIAA Guidance, Navigation, and Control Conference*, San Francisco, CA, August 2005.
124. A. Hoskins and E. Atkins, "Spacecraft Formation Optimization with a Multi-Impulse Design," in *Proc. AIAA Guidance, Navigation, and Control Conference*, San Francisco, CA, August 2005.
125. W. Ren, R. Beard, and E. Atkins, "A Survey of Consensus Problems in Multi-Agent Coordination," in *Proc. American Control Conference (ACC)*, Seattle, WA, June 2005.
126. M. Xue and E. Atkins, "Three-Dimensional Segmented Trajectory Optimization for Runway-Independent Aircraft," in *Proc. AIAA Aerospace Sciences Meeting*, Reno, NV, January 2005.
127. J. Lennon and E. Atkins, "Optimal Path Planning with Behavior-Based Cost Definition," *Proc. 1st AIAA Intelligent Systems Conference*, Chicago, IL, September 2004.
128. M. Strube, R. Sanner, and E. Atkins, "Dynamic Flight Guidance Recalibration after Actuator Failure," *Proc. 1st AIAA Intelligent Systems Conference*, Chicago, IL, September 2004.
129. D. Chavez-Clemente and E. Atkins, "Optimization of Tetrahedral Satellite Formations," *Proc. AIAA Guidance, Navigation, and Control Conference*, Providence, RI, August 2004.
130. E. Atkins, "Dynamic Waypoint Generation given Reduced Flight Performance," in *Proceedings of the AIAA Aerospace Sciences Conference*, Reno, NV, January 2004.
131. 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.
132. 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.
133. 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.
134. 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.

135. 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.
136. E. Atkins and R. Sanner, "QoS Tradeoffs for Guidance, Navigation, and Control," *Proceedings of the IEEE Aerospace Conference*, Big Sky, MT, March 2002.
137. 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).
138. 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).
139. 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.
140. 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.
141. 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 Conf. on Autonomous Agents*, pp. 244-251, Seattle, WA, May 1999.
142. 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.
143. 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)
144. 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)
145. 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]
146. 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)
147. 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/products in popular press and online media

Dr. Atkins' research group website: <https://a2sys.engin.umich.edu/>

Recent autonomous UAS roofing video: <https://www.youtube.com/watch?v=GA445Flxkjo>

Dr. Atkins is often contacted by the popular press re: aviation safety, UAS, and space, e.g., <https://www.ieee.org/about/news/media/ieee-in-the-media.html>

1. E. Atkins, "Real-time Flight Control: Embedded Sensor Calibration and Data Acquisition," *Journal of Visual Experiments (JoVE)*, Collection on Aeronautical Engineering (Invited), 2019. Issue website: <https://www.jove.com/science-education-library/82/aeronautical-engineering>, Article website: <https://www.jove.com/science-education/10470/real-time-flight-control-embedded-sensor-calibration-data>

2. P. Sharma and E. Atkins, "Multicopter Aerodynamics: Characterizing Thrust on a Hexacopter," *Journal of Visual Experiments (JoVE)*, Collection on Aeronautical Engineering (Invited), 2019. Issue website: <https://www.jove.com/science-education-library/82/aeronautical-engineering>, Article website: <https://www.jove.com/science-education/10469/multicopter-aerodynamics-characterizing-thrust-on-a-hexacopter>
3. E. Atkins, "Attention on Drone Safety and Data Collection," *Aerospace America Year in Review (YIR)*, Vol. 55, No. 11, pp. 51-51, AIAA.
4. 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 Submitted publications

1. N. Li, Y. Yao, I. Kolmanovsky, E. Atkins, and A. Girard, "Game-Theoretic Modeling of Multi-Vehicle Interactions at Uncontrolled Intersections," *IEEE Transactions on Intelligent Transportation Systems*, April 2019 (under review).

c.4.7 Invited presentations and panels

Presentations:

1. Keynote, "Autonomy and Safety for Urban Air Mobility (UAM)", NASA Ames (USRA), Mar. 2020 (last trip before stay-at-home!).
2. Keynote, "Data to Decisions for Safe Flight," *Sustainable Aviation Conference* (University of California – Berkeley), Oct. 2019.
3. Invited Seminar Speaker, "Data to Decisions for Safe Flight," *University of Pennsylvania, Purdue University, University of Miami, Georgia Tech, University of Illinois Urbana – Champaign (UIUC), AI Symposium (University of Michigan), State University of New York - Buffalo*, 2018-2019.
4. Keynote Speaker, "Contingency Flight Planning for Urban Air Mobility (UAM)," *University of Texas – Arlington UAS Workshop*, April 25, 2019.
5. Invited Speaker, "Fusing Offline and Online Environment Percepts for Autonomous Aviation," *ARO Workshop on Distributed Reinforcement Learning Games*, College Park, MD, April 12-13, 2019.
6. Keynote Speaker, "Machine Learning to Improve Efficiency and Safety of Airline Operations," *FlightGlobal Aerospace Big Data Conference*, Miami, FL, September 11-12, 2018.
7. Invited Speaker, "Autonomous Contingency Management for Manned and Unmanned Aircraft," *NASA Langley / National Institute of Aerospace Blue Sky Workshop*, August 21-22, 2018.
8. Keynote Speaker, "Cyber-physical Flight Planning for Nominal and Emergency Situations," *Midwest Robotics Workshop*, Toyota Technical Institute (TTI), Chicago, IL, June 14, 2018.
9. Control Systems Seminar Speaker, "Safe Multi-Vehicle System Planning and Coordination," *University of Michigan*, March 16, 2018.

10. Invited Seminar Speaker, "Cyber-physical Flight Planning for Nominal and Emergency Situations," *Kansas State University*, Manhattan, KS, March 2, 2018.
11. Invited Seminar Speaker, "Cyber-physical Flight Planning for Nominal and Emergency Situations," *AERO 585 Seminar, University of Michigan*, Oct. 19, 2017.
12. Invited Speaker, "Trust in Autonomous Systems: About Trust and Technology," *Cultivating Trust in Autonomous Systems Conference*, Virginia Tech, Blacksburg, VA, October 16-17, 2017.
13. Invited Presenter, "Safe Autonomous Flight in Off-Nominal Conditions," *Aerospace Engineering Faculty and Staff Brown Bag Lunch & Learn*, University of Michigan, March 28, 2017.
14. Keynote Presenter, "Safe Autonomous Manned and Unmanned Flight in Off-Nominal Conditions," *Future Technologies Conference (FTC)*, SAI, San Francisco, CA, Dec. 7, 2016.
15. 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.
16. Invited Speaker, "Safe Autonomous Flight in Off-Nominal Conditions," *Ann Arbor City Club*, December 14, 2016.
17. Invited Seminar Speaker, "Toward Safe and Autonomous Manned and Unmanned Flight in Off-Nominal Conditions," *Iowa State University*, Oct. 28, 2016.
18. Invited Seminar Speaker, "Toward Safe and Autonomous Manned and Unmanned Flight in Off-Nominal Conditions," *Duke University*, September 7, 2016.
19. Lecture (2 hours), "Unmanned Aircraft System (UAS) or "Drone" Technology," *Society of Active Retirees (SOAR)*, Detroit, MI, May 11, 2016.
20. Invited Speaker, "Technologies for Safe and Autonomous Unmanned Aircraft Systems (UAS), *Rotary Club of Ann Arbor*, February 2016.
21. 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.
22. Invited Seminar Speaker, "Toward Safe and Autonomous Flight in Public and Immediate Reaches Airspace," *University of North Texas*, Denton, TX, August 28, 2015.
23. 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.
24. Invited Presentation, "Toward Safe and Autonomous Flight in Public and Immediate Reaches Airspace," *Stanford University*, Palo Alto, CA, July 31, 2015.
25. Invited Seminar Speaker, "Toward Safe and Autonomous Flight in Public and Immediate Reaches Airspace," *University of Minnesota*, Minneapolis, MN, March 6, 2015.
26. Invited Seminar Speaker, "Toward Safe and Autonomous Aircraft with Access to Airspace," *NASA Langley Research Center*, July 31, 2014.

27. Invited Seminar Speaker, "UAS Autonomy and Airspace Management," *Georgia Tech*, Atlanta, GA, April 2014.
28. Plenary Speaker, "UAS Navigation and Control," *Michigan UAS Conference*, Ann Arbor, MI, October 2013.
29. Invited Seminar Speaker, "Robust Autonomy: A Science-Optimal Spacecraft Mission Planner with Fault Tolerance," *NASA Jet Propulsion Laboratory (JPL)*, November 2012.
30. Invited Seminar Speaker, "Toward Safe and Autonomous Aerospace Systems," *University of Nebraska – Lincoln*, Computer Science & Engineering Dept., November 2012.
31. Invited Seminar Speaker, "Toward Safe and Autonomous Aerospace Systems," *Virginia Tech*, Aerospace & Ocean Engineering Dept., November 2012.
32. Invited Presentation, "From CPS to UAS in the NAS," *Defense Science Study Group (DSSG)*, Institute for Defense Analysis (IDA), June 2012.
33. 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.
34. Invited Seminar Speaker, "Toward Cyber-Physical Coupling in Aerospace Education and Research," *University of Illinois (Urbana-Champaign)*, October 2011.
35. Invited Speaker, "Certifiable Autonomous Flight Management for Unmanned Aircraft Systems," *National Academy of Engineering (NAE) US Frontiers of Engineering (USFOE) Symposium*, September 2010.
36. Invited Speaker, "Certifiable Autonomous Flight Management for Unmanned Aircraft Systems (extended presentation)," *IDGA UAV Summit (UAV Focus Day)*, April 2010.
37. Invited Speaker, "The Flying Fish Persistent Ocean Surveillance Platform," *Aerospace Control and Guidance Systems Committee (ACGSC) Meeting*, Lake Tahoe, CA, March 2010.
38. 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.
39. 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.
40. Invited Speaker, "Autonomous Decision-Making for Safe Flight Management," *BlueOrigin* (www.blueorigin.com), March 15, 2008.
41. Invited Seminar Speaker, "Practical Autonomous Decision Making for Flight Management Systems", *Wayne State University*, Detroit, MI, January 2008.
42. Invited Speaker, "Practical Autonomous Decision-Making for Flight Management Systems," *Soar Technology, Inc.* (www.soartech.com), November 2007.
43. Invited Speaker, "Physically-Proximal Human-Robot Collaboration for Air and Space Applications," *PerMIS (Performance Metrics for Intelligent Systems) Workshop*, NIST, August 2007.

44. Invited Seminar Speaker, “Air Vehicle Mission Adaptation to Damage and Failures”, *Eglin Air Force Base (Air Force Research Lab)*, July 22, 2007.
45. 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.
46. 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.
47. 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.
48. 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.
49. 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.
50. Invited Seminar Speaker, “Robust Mission and Trajectory Planning for Air and Space Vehicles,” *Texas A&M University*, College Station, TX, October 25, 2005.
51. 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: “Urban Air Mobility Workshop: Airspace System and Operational Challenges,” Transportation Research Board (TRB) Meeting, Jan. 12, 2020.
2. Panelist: “Ethics in AI,” University of Michigan, Oct-Nov 2019 (Two events: AI Symposium, Robotics and AI Symposium).
3. Panelist, “Dissonance in AI,” University of Michigan, April 17, 2019. (Other panelists: Mike Wellman, Ram Vasudevan, Kentaro Toyama).
4. Panelist, “Crossing the Finish Line for Autonomous Flight and Operations,” NASA Ames Autonomy Workshop, April 23-24, 2019.
5. Panelist, “Mobile Applications of AI,” *AI in Action Workshop*, Office of Naval Research (ONR) at Georgia Tech Research Institute (GTRI), September 26-27, 2018.
6. Panelist, “Real-time Health Management,” *FlightGlobal Aerospace Big Data Conference*, Miami, FL, September 11-12, 2018.
7. Panelist / Session Moderator, “V&V for New Entrants (Topic H),” *NASA Airspace Operations and Safety Program (AOSP) R&D Partnership Workshop*, NASA Ames, April 10-12, 2018.
8. Panelist, “Urban Air Mobility,” *Intelligent Systems Workshop*, AIAA Intelligent Systems Technical Committee, University of Michigan, July 26-27, 2017.

9. Panelist, “Vetronics, Software and Cybersecurity,” *AeroAuto Conference*, SpeedNews and Aviation Week, The Henry, Dearborn, MI, May 4, 2017.
10. Panelist, “Future of Aviation,” *University of Michigan SGT*, Mar. 27, 2017.
11. Panelist, “Establishing Trust in Autonomous Systems,” *Infotech@Aerospace Conference at Scitech*, AIAA, Jan. 2017.
12. Panelist, “Formal Methods for Software Verification,” *Infotech@Aerospace Conference at Scitech*, AIAA, Jan. 2017.
13. Panelist and Panel Co-Chair, “Autonomous Flight,” *American Association for Artificial Intelligence (AAAI) Conference*, AAAI, Feb. 16, 2016.
14. Panelist, “Assured Autonomy,” *Infotech@Aerospace Conference at Scitech*, AIAA, Jan. 2016.
15. Panelist, “Intelligent Systems Roadmap,” *Infotech@Aerospace Conference at Scitech*, AIAA, Jan. 2016.
16. Panelist, “Small UAS in the Educational Setting”, *UAS Traffic Management (UTM) Conference*, NASA/AUVSI, NASA Ames, Moffett Field, CA, July 2015.
17. Panelist, “UAS Panel Discussion,” *Research on the Hill*, organized by the University of Maryland, Washington, DC, July 2015.
18. Panel Chair, “Autonomy Research Agenda for Civil Aviation,” *Infotech@Aerospace Conference at Scitech*, AIAA, January 2015.
19. Panelist, “Intelligent Systems Technical Committee Panel on Autonomy,” *Infotech@Aerospace Conference at Scitech*, AIAA, January 2015.
20. 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.
21. Panelist, “Software Engineering Education in Aerospace,” *Aerospace Sciences Meeting*, AIAA, January 2011.
22. Panelist, “Space Robotics: Missions and Autonomy Challenges,” *Spacecraft Autonomy: New Directions for the Future*, *IEEE Aerospace Conference*, Big Sky, MT, March 2006.
23. 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).
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, College of Engineering, 2017 – present, Member
 2. Aerospace Engineering Advisory Committee, 2019 – present, Member
 3. Institutional Autonomous Systems Committee (IASC), 2016 – present, Member, Co-Chair
 4. Graduate Committee, Robotics Program, 2014 - present, Chair
 5. Aerospace Computing Curriculum Committee, 2014 – 2018, Chair
 6. Robotics Building Committee, Robotics Program, 2014 - present, Member
 7. M-Air Design Committee, Robotics Program, 2015 – 2017, Member
 8. Executive Committee, Robotics Program, 2016 – 2017, Member
 9. Undergraduate Committee, Aerospace Engineering, 2016- 2017, Member
 10. Faculty Search Committee, Aerospace Engineering, 2014 - present, Member
 11. Unmanned Systems Committee, 2015 – 2016, Member
 12. Program Director Search Committee, Robotics Program, 2014 - 2016, Member
 13. Robotics Research & Development Engineer Search, 2014 – 2015, Chair
 14. Steering Committee, Robotics Program, 2012 - 2016, Member
 15. Internal Review Committee, Aerospace Engineering, 2012 – 2014, Chair
 16. Department Chair Search Committee, Aerospace Engineering, 2011 - 2012, Member
 17. Engineering 101 / 151 Steering Committee, 2008-2012, Member; Chair (2009-2011)
 18. Faculty Search Committee (CoE), Robotics, 2007 – 2008, Member
 19. Undergraduate Committee, Aerospace Engineering, 2007 - 2009, Member
- d.2 Administrative duties at U of M
1. Associate Director, Robotics Institute (2016 – present)
 2. College of Engineering Executive Committee (2017-present)
 3. Institutional Autonomous Systems Committee (IASC) (inception-present)
 4. LAUNCH Junior Faculty Mentoring (2016 – 2018)
 5. University of Michigan AIAA Student Chapter Advisor (2014 – present)
 6. Michigan Autonomous Aerial Vehicle (MAAV) Student Team Advisor (2013 – present)
 7. Aerospace Engineering Undergraduate Student Advisor (2007 – present)
 8. Graduate Chair, Robotics Program (2014 – present)
- d.3 Service to government or professional organizations, and service on review board/study panels
1. Editor-in-Chief, *AIAA Journal of Aerospace Information Systems* (2018-present)
 2. Executive Steering Committee, *AIAA Aviation Conference* (2020 conference)

3. Study committee member, "Advancing Aerial Mobility: A National Blueprint," (report available at <https://www.nap.edu/read/25646/chapter/1>), National Academy of Science (NAS) for NASA Aeronautics, (2019-2020)
4. Program Committee, *Innovative Applications of Artificial Intelligence (IAAI) Conference* (2019-2020 conferences).
5. Proposal Reviewer, *NASA Earth Science AI Systems Technologies (AIST) Program*, 2017, 2020.
6. Proposal Reviewer, *NASA Space Technology Research Fellowship (NSTRF) Program*, 2017-2020.
7. Proposal Review Panelist, *Cyber-Physical Systems*, NSF, July and September 2018.
8. Reviewer, "In-Time Aviation Safety Management: Challenges and Research for an Evolving Aviation System," *National Academies Press*, 2018.
9. Program Committee, *The 9th NASA Formal Methods (NFM) Symposium*, NASA Ames Research Center, Moffett Field, CA, (May 2017).
10. Proposal Review Panelist, *Cyber-Physical Systems (CPS) Program*, NSF, Nov 2017, July 2017, July 2016 (and previous years).
11. Peer Review Board, *Crew Systems and Aviation Operations Branch*, NASA Langley Research Center, Hampton, VA (Jan. 2015)
12. Reviewer, "A 21st Century Cyber-Physical Systems Education," *National Academies Press*, 2016.
13. Autonomy Breakout Session Chair (and Intelligent Systems Roadmap co-author), "Intelligent Systems Workshop," *AIAA Intelligent Systems Technical Committee*, Dayton, OH, 2014.
14. Volume Editor, Unmanned Aircraft Systems, *Encyclopedia of Aerospace Engineering* (Wiley) (2013-2016)
15. Study Committee Member (Report Co-Author), "Autonomy Research for Civil Aviation: Toward a New Era of Flight," *National Research Council* (2013-2014)
16. Member, *Institute for Defense Analysis (IDA) Defense Science Study Group (DSSG)* (2012-2013)
17. Study Member, "Engineering Resilient Space Systems," *Keck Institute for Space Studies, CalTech/JPL* (2012-2013)
18. Member, Aeronautics & Space Engineering Board (ASEB), *National Academy / National Research Council* (2011-2015)
19. Member, Aeronautics Roundtable, *National Research Council* (2011-2014)
20. Program committee, *International Conference on Cyber-Physical Systems (ICCPS)*, IEEE (2011-2014)
21. Member, *University of Michigan Senate Assembly* (2011-2013)
22. Member, *AIAA Software Technical Committee* (2011-present)
23. Committee Member (Report Editor), "NASA Aviation Safety Program Review," *National Research Council* (2009-2010)
24. Section Editor, *Encyclopedia of Aerospace Engineering* (Wiley) (2008-2014)
25. Chair, *AIAA Intelligent Systems Technical Committee* (2007-2009)
26. Program Committee, Intelligent Systems Track, *AIAA Aerospace Sciences Meeting* (2007-2011)
27. Program Committee, *5th International Workshop on Planning and Scheduling for Space*, Space Telescope Science Institute, Baltimore, MD (2006)
28. Technical Program Chair, *AIAA Infotech@Aerospace Conference* (2005-2007)

29. 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)
30. Review Panelist for NASA Jet Propulsion Lab’s Advanced Multi-Mission Operational Systems (AMMOS) Program, 2005 – 2011 (panel chair 2010-2011).
31. Associate Editor, *AIAA Journal of Aerospace Computing, Information, & Communication* (JACIC) (2004-2013) (JACIC became the *Journal of Aerospace Information Systems* in 2013)
32. Invited Session Organizer, Session Chair, Program Committee, *AIAA Intelligent Systems Conference*, Chicago (2004)
33. Local Program Chair, Session Chair, *IEEE Intl. Conference on Robotics & Automation* (ICRA) (2002)
34. Program committee, *AAAI Spring Symposium on Safe Learning Agents*, Stanford University (2002)
35. Member, *AIAA Intelligent Systems Technical Committee* (2001-present)
36. Member, *AIAA Software Technical Committee* (2013-present)
37. Co-chair, *AAAI Spring Symposium on Robust Autonomy*, Stanford University (2001)
38. Member, *AIAA Space Automation and Robotics Technical Committee* (2000-2003)
39. Paper Reviewer, AIAA and IEEE journals and conferences (2000 - present)
40. 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. Ehsan Taheri** (with Prof Ilya Kolmanovsky); Dr. Taheri joined a future faculty postdoctoral program at Texas A&M University.
5. Postdoctoral Mentor to **Dr. Hossein Rastgoftar** (ongoing); Dr. Rastgoftar was promoted to an Assistant Research Scientist at the University of Michigan in Dec. 2017.

d.5 Other

- Airport Owner and Operator, Shamrock Field, Brooklyn, MI; a Michigan-certified Public Airport (2010 – 2019)