# PANAGIOTIS TSIOTRAS

**School Aerospace Engineering**
**Institute for Robotics and Intelligent Machines**
**Georgia Institute of Technology**
**Atlanta, GA 30332-0150**

**http://dcsl.gatech.edu**
**https://scholar.google.com/citations?user=qmVayjgAAAAJ&hl=en**
**h-index: 57**

## I. Earned Degrees

Ph.D.        Aeronautics and Astronautics, Purdue University, 1993

M.S.         Mathematics, Purdue University, 1992

M.S.         Aerospace Engineering, Virginia Tech, 1987

Eng.Dipl.    Mechanical Engineering, National Technical Univ., Athens, Greece, 1986 (top 1%)

## II. Professional Experience

Georgia Institute of Technology, Atlanta, Georgia
    Institute for Robotics and Intelligent Machines (IRIM)

   *Associate Director*, 2016–

   Coordinated all campus activities in the area of autonomy. Administered the IRIM Seed Grants program, established and administered the IRIM Visiting Faculty and Resident Faculty Fellows programs, organized several campus visits by companies, served as representative/liaison of GaTech in Sandia's Academic Partnership in the area of autonomy, co-lead and promoted the Autonomous/Connected Living Lab initiative on campus, and worked closely with executive IRIM director to strengthen the ties between IRIM and GTRI and re-structure and re-launch the IRIM industrial affiliates program.

Georgia Institute of Technology, Atlanta, Georgia
    School of Electrical and Computer Engineering

   *Adjunct Professor*, 2019–

   In recognition for mentoring and advising students in Electrical and Computer Engineering. Research in the area of control theory and autonomous systems.

Georgia Institute of Technology, Atlanta, Georgia
    School of Aerospace Engineering

   *David and Andrew Lewis Endowed Chair Professor*, 2019–

   In recognition for accomplishments and contribution to the School of Aerospace Engineering and the aerospace profession. Research in the area of autonomous systems and in the intersection of control theory and AI.

   *College of Engineering Dean's Professor*, 2012–2018

   In recognition for accomplishments and contributions to the School of Aerospace Engineering and the aerospace profession. Research in the area of autonomous systems and in the intersection of control theory and AI.

_Professor_, 2005–2012

Research in the areas of wavelet optimization, multiple-rendezvous servicing of satellite constellation, autonomous aerial and ground vehicle guidance, experimental vision-based automated rendezvous and docking in space. Main funding sources include NSF, ARO, AFOSR, NASA, NRO, AFRL, DARPA, ARL, Ford Motor Co. Principal investigator of MURI award "Neuro-Inspired Adaptive Perception for Agile Mobility of Autonomous Ground Vehicles," from ARO.

_Associate Professor_, 1998–2005

Research in the areas of active magnetic bearing control design, high-speed vehicles, spacecraft control, friction modeling. Main funding sources include NSF, NASA, ARO, AFOSR, AFRL and private industry. Granted tenure in March 2001.

_Director_, Dynamics and Control Systems Laboratory, 1998–

Supervised research and educational programs both at graduate and undergraduate level in the area of Dynamics and Controls. Research in the area of control of nonlinear systems emphasizing mechanical and aerospace applications.

Massachusetts Institute of Technology, Cambridge, Massachusetts
    Laboratory for Information and Decision Systems

_Visiting Scholar_, 2014–2015

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California
    Mobility and Robotic Systems Section, Autonomous Systems Division

_Summer Visiting Faculty Fellow_, June 2014, 2016, 2017, 2018

Ecole Nationale Superieure des Mines de Paris, Paris, France
    Centre Automatique et Systémes

_Visiting Research Scholar_, May 2003–July 2003

Conducted research in the use of wavelets for control applications; in collaboration with Dr. F. Chaplais.

INRIA, Rocquencourt, France
    Control of Complex Systems Group (SOSSO Projet)

_Visiting Research Scholar_, September 2002–May 2003

Conducted research in modeling and short-term control of the cardiovascular system; in collaboration with Dr. M. Sorine.

_Visiting Research Scholar_, November–December 2000

Conducted research in the area of time-delayed linear, parameter-varying systems; in collaboration with Dr. P.-A. Bliman.

School of Engineering and Applied Science, University of Virginia, Charlottesville, Virginia
    Department of Mechanical and Aerospace Engineering

_Assistant Professor_, 1994–1998

Research in the areas of spacecraft control, nonholonomic motion planning, active magnetic bearing control, inverse optimality and passivity-based control for aerospace applications. Main funding sources included NSF, NASA and private industry. Received the NSF Faculty Early Career Development (CAREER) Award.

_Director_, Dynamics and Control Systems Laboratory, 1996–1998

Developed laboratory through NSF CAREER Award. Supervised research and educational programs both at graduate and undergraduate level in the area of Dynamics and Controls.

Purdue University, West Lafayette, Indiana
  School of Aeronautics and Astronautics

_Post-Doctoral Fellow_, 1993–1994

Worked on developing robust and optimal control for rotating bodies. Performance requirements were measured in the $\mathcal{L}_2$ sense (with Dr. M. Corless and Dr. M. Rotea).

_Research Assistant_, 1989–1993

Developed analytic solutions for the equations of spinning rigid bodies for the case of constant and time-varying, body-fixed torques. Developed new kinematic formulations for the attitude kinematics and new control laws for underactuated rotating vehicles (with Dr. J. Longuski).

_Teaching Assistant_, 1989–1991

Assisted in teaching courses on _Analytical Dynamics_ and _Vibrations_.

Virginia Polytechnic Institute and State University, Blacksburg, Virginia
  Interdisciplinary Center of Applied Mathematics

_Research Associate_, 1989

Worked on closed-loop feedback laws for on-board trajectory guidance for the Advanced Launch System (ALS) using singular perturbations (with Dr. Eugene Cliff).

Department of Aerospace and Ocean Engineering

_Research Assistant_, 1986–1987

Worked on optimal control laws for trajectory optimization for aerospace vehicles. New switching structures were found for the well-studied Goddard problem of a rocket in vertical flight. A new method for determining the optimal switching structure for trajectories with singular arcs was also proposed (with Dr. H. Kelley).

_Teaching Assistant_, 1986–1987

Assisted in courses on _Astromechanics_ and _Stability and Control of Aerospace Vehicles_.

Hellenic Air Force, General Command, Athens, Greece
  _Computer Programmer_, 1987–1988 (during military service)

## III. Teaching

### A. Individual Student Guidance

Current and Past Post-Doctoral Students

Ali Pakniyat August 2019–

Research in the area of stochastic optimal control

Katherine Skinner, August 2019–
  Research in the area of vision-based space relative navigation

Dipankar Maity, August 2018–
  Research in the area of bounded-rational stochastic games

Georgios Kotsalis, August 2015–June 2016
  Research in the area multi-agent differential games with incomplete and asymmetric information
  Currently, Post-doctoral fellow, Department of Mathematics, Georgia Tech

Michael Kontitsis, August 2013–February 2016
  Research in the area of perception-based guidance
  Currently, Research Engineer, ATK/Orbital corporation

Efstathios Bakolas, January 2012–August 2012
  Research in the area of path-planning of autonomous vehicles subject to kinodynamic constraints
  Currently, AssociateProfessor, Department of Aerospace Engineering,
  University of Texas, Austin, TX.

Raghvendra Cowlagi, May 2011–November 2011 (jointly with MIT Aero-Astro department)
  Research in the area of control and perception for wheeled vehicles under abnormal
  driving conditions. Currently Associate Professor, Department of Mechanical Engineering
  Worcester Polytechnic Institute, Worcester, MA

Annalisa Scacchioli, March 2008–February 2010
  Research in the area of ground vehicle control under abnormal driving conditions
  Currently, visiting Assistant Professor, Mech. Engineering, New York Polytechnic, New York

Dongwon Jung, December 2007–April 2009
  Research in the area of emergency trajectory generation for aircraft
  Currently, Assistant Professor at the Korea Aerospace University, Goyang, South Korea

Efstathios Velenis, May 2006–December 2007
  Research in the area of analysis and control of high-speed land vehicles
  Currently Lecturer, Department of Automotive Engineering, Cranfield University, Cranfield, UK

Alexander Lanzon, January 2001–September 2001
  Research in the area of robust control of Linear, Parameter Varying (LPV) systems
  Currently Professor, School of Electrical and Electronic Engineering, Univ. of Manchester, UK

Seddik Djouadi, January 1999–January 2000
  Research in the area of robust control of Linear, Parameter Varying (LPV) systems
  Currently Professor, Dept. of Electrical Eng. and Comp. Science, Univ. of Tennessee

Current Graduate Students

1. Matthew Brewer, Doctor of Philosophy (advised since August 2016), expected graduation date May 2021
2. Daniel Larsson, Doctor of Philosophy (advised since August 2016), expected graduation date August 2021
3. Mehregan Dor, Doctor of Philosophy (advised since August 2016), expected graduation date August 2020

4. Venkata Ramana Makkapati, Doctor of Philosophy (advised since August 2016), expected graduation date August 2020

5. Kelsey Hawkins (Robotics program), Doctor of Philosophy (advised since May 2017), expected graduation date May 2021

6. Sagar Joshi (Robotics program), Doctor of Philosophy (advised since August 2017), expected graduation date May 2022

7. Dongliang Zheng, Doctor of Philosophy (advised since August 2018), expected graduation date May 2023

8. Yue Guan, Doctor of Philosophy (advised since August 2018), expected graduation date May 2023

9. Matthew King-Smith (Robotics program), Doctor of Philosophy (advised since August 2017), expected graduation date December 2022

10. Jack Ridderhof, Doctor of Philosophy (advised since May 2016), expected graduation date May 2021

11. Nolan Wagener (Robotics program), Doctor of Philosophy, (co-advised since August 2019), primary advisor: Byron Boots, expected graduation date May 2021

12. Jaein Lim, Doctor of Philosophy (advised since August 2017), expected graduation date December 2022

13. Travis Driver (Robotics program), Doctor of Philosophy, (advised since August 2019), expected graduation date May 2024

14. Ankit Kaushik, Master of Science (advised since August 2017), expected graduation date December 2019

15. Qifan Zhang (Robotics program), Master of Science (advised since August 2019), expected graduation date May 2020

16. Connor Lawson (Robotics program), Doctor of Philosophy, (advised since August 2019), expected graduation date May 2022

17. Joshua Pilipovksy, Master of Science (advised since January 2020), expected graduation date May 2021

Previous Graduate Students - Doctoral

1. Jihao Luo (1999), Thesis Title: "Control on Underactuated and Nonholonomic Systems," Currently with Garmin Electronics, Kansas City, MO

2. Jianrong Zhang (co-advisor with C. Knospe) (2000), Thesis Title: "Analysis of Systems with State Delay: A Comparison System Framework," First position after graduation: Lucent Technologies, Boston, MA. Current position unknown.

3. Haijun Shen (2003), Thesis Title: "Optimal Scheduling for Satellite Refueling in Circular Orbits," Currently with Analytical Mechanics and Associates, Inc., Hampton, VA

4. Xiping Zhang (2003), Thesis Title: "Parameter-Dependent Lyapunov Functions and Stability Analysis of Linear Parameter-Dependent Dynamical Systems," First position after graduation: Research Engineer, ASDL, Georgia Institute of Technology. Current position unknown.

5. Hyungjoo Yoon (2004) Thesis Title: "Spacecraft Attitude and Power Control Using Variable Speed CMGs," Currently at the Korea Aerospace Research Institute (KARI), Daejeon, South Korea

6. Brian Wilson (co-advisor with B. Heck) (2004), Thesis Title: "Control Design for Low-Loss Active Magnetic Bearings: Theory and Implementation," Currently with Draper Laboratory, Cambridge, MA.

7. Efstathios Velenis (2006), Thesis Title: "Analysis and Control of High-Speed Autonomous Vehicles," Currently Lecturer, Department of Automotive Engineering, Cranfield University, Cranfield, UK.

8. Dongwon Jung (2007), Thesis Title: "Hierarchical Path Control of a Small Fixed-wing UAV: Theory and Experimental Validation," First position after graduation: Korea Aerospace Research Institute (KARI), Daejeon Korea. Currently Assistant Professor, Aerospace Engineering, Korea Aerospace University.

9. Sachin Jain (2008), Thesis Title: "Multiresolution Strategies for the Numerical Solution of Optimal Control Problems," Currently with Aurora Flight Sciences, Cambridge, MA.

10. Atri Dutta (2009), Thesis Title: "Optimal Cooperative and Non-Cooperative Peer-to-Peer Maneuvers for Refueling Satellites in Circular Constellations," First position after graduation: Research Engineer, Air Transportation Center, Georgia Institute of Technology. Currently, Assistant Professor, Department of Aerospace Engineering, Wichita State University.

11. Raghvendra Cowlagi (2011), Thesis Title: "Hierarchical Motion Planning for Autonomous Aerial and Terrestrial Vehicles," Currently, Associate Professor, Department of Mechanical and Aerospace Engineering, Worcester Polytechnic Institute.

12. Efstathios Bakolas (2011), Thesis Title: "Optimal Steering for Kinematic Vehicles with Applications to Spatially Distributed Agents," Currently, Associate Professor, Department of Aerospace Engineering, University of Texas at Austin.

13. Yiming Zhao (2011), Thesis Title: "Efficient And Robust Aircraft Landing Trajectory Optimization," First position after graduation: Mitsubishi Electric Research Laboratories, Cambridge, MA.

14. Nuno Felipe (2014), Thesis Title: "Nonlinear Position and Attitude Control For Satellite Proximity Operations: An Approach Based on Dual Quaternions," First position after graduation: JPL

15. Oktay Arslan (2015 - Robotics program), Thesis Title: "Machine Learning and Dynamic Programming Algorithms for Motion Planning and Control," First position after graduation: JPL. Currently, Research Engineer, Tesla Autopilot

16. Sun Wei (2017), Thesis Title: "Pursuit-Evasion and Differential Games under Uncertainties," First position after graduation: Assistant Professor, School of Aerospace and Mechanical Engineering, University of Oklahoma

17. Ioannis Exarchos (2017), Thesis Title: "Stochastic Optimal Control - An FBSDE Sampling Approach," First position after graduation: Post-doctoral fellow, Department of Medicine, Emory University.

18. Alfredo Valverde (2018), Thesis Title: "Dynamic Modeling and Control of Spacecraft Robotic Systems using Dual Quaternions," First position after graduation: JPL.

19. Takuma Nakamura (co-advisor with E. Johnson) (2018), Thesis Title: "Multiple-Hypothesis Vision-Based Landing Autonomy," First position after graduation: Amazon Prime Air.

20. Florian Hauer (2019), Thesis Title: "Path-Planning Algorithms in High-Dimensional Spaces," First position after graduation: Zee-Aero.

21. Changxi You (2019), Thesis Title: "Autonomous Aggressive Driving: Theory And Experiments," First position after graduation: Tencent Technology.

22. Kazuhide Okamoto (2019), Thesis Title: "Optimal Covariance Steering: Theory and its Application to Autonomous Driving," First position after graduation: Zoox.

Previous Graduate Students - Masters

1. Stephen Mason (1997), Thesis Title: "Linear Parameter-Varying Controllers for Magnetic Bearings"

2. Haijun Shen (1998), Thesis Title: "Time-Optimal Control of Axisymmetric Spacecraft with Two Controls"

3. Byungmoon Kim (1999), Project Title: "Experimental Comparison of Controllers for Wheeled Mobile Robots"

4. Alexander Schleicher (1999), Project Title: "Partial Stabilization of a Rigid Body Spacecraft using Two Control Torques"

5. Viktoria Doumtchenko (2000), Project Title: "Control of Underactuated Spacecraft"

6. Efstathios Velenis (2000), Project Title: "Low-Bias Control of Active Magnetic Bearings"

7. David Richie (2001), Thesis Title: "Combined Attitude Control and Energy Storage Using VSCMG's"

8. Chandeok Park (2002), Project Title: "Numerical Solution of Optimal Control Problems using Wavelets"

9. Ancil Marshal (2002), Project Title: "Control of Underactuated Spacecraft"

10. Caroline Muller (2002), Project Title: "Haar Wavelets Applied to Linear Systems"

11. Arnaud de Nailly (2004), Project Title: "Coordinated Satellite Rendezvous"

12. Debao Zhou (2004), Project Title: "Development of Communication Algorithms Between a Ground Station and the UAV Platform"

13. Kenneth Dienmunsch (2004), Project Title: "Analysis of Low-Bias AMB Control via Describing Function Methods"

14. Atri Dutta (2005), Project Title: "Optimal Peer-to-Peer Refueling Strategies for Satellites in Circular Constellations"

15. Emmanuel Levy (2005), Project Title: "Autopilot Design for a UAV"

16. Mark Hunkele (2005), Project Title: "Relative Vision-Based Range and Attitude Determination"

17. Alexandros Salazar-Kardozo (2006), Thesis Title: "A High-Level Framework for the Autonomous Refueling of Satellite Constellations"

18. Efstathios Bakolas (2007), Thesis Title: "A Hierarchical On-Line Path Planning Scheme using Wavelets"

19. Imon Chakraborty (2011), Project Title: "Time-Optimal Control for Collision Mitigation at Intersections"

20. Daniel Kuheme (2011), Project Title: "Aggressive Maneuvers of Vehicles using Multi-Stage Control"

21. Spyros Zafeiropoulos (2013), Project Title: "Design of a Lane-Tracking Driver Steering Assist System and Its Interaction with a Two-Point Visual Driver Model"

22. Ioannis Exarchos (2013), Project Title: "Two-Player Pursuit-Evasion: An Asymmetric Two Car Game"

23. Su Yeon Choi (2016), Thesis Title: "Automatic Mass Balancing System For The 5-Dof Spacecraft Simulator"

24. Matthew Brewer (2016), Thesis Title: "Partial Synchronization of Underactuated Satellite Systems"

25. Jack Ridderhof (2019), Project Title: "Covariance Steering for Powered Descent Guidance"

26. Gerard Bennett (2019), Project Title: "Covariance Steering of a Quadrotor for Landing on Moving Targets"

27. Noe Monterossa (2019), Project Title: "Semi-Autonomous Perching with Quadrotor and 1-DoF Robotic Arm"

28. Julius Kortenbruck (2019), Project Title: "Development of a Tire-Road Friction Estimator" (Univ. of Stuttgart exchange program).

## Current and Previous Visiting Graduate Students

– Lorenzo Ticozzi, Politecnico di Milano (2019-2020)
– Giovanni Corinaldesi, Politecnico di Milano (2019-2020)
– Andrea Antonello, University of Padova (2017)
– Giuseppe di Mauro, Politecnico di Milano (2012)

## Current Undergraduate Students

– Nicholas Brittain, "Electronic and Computer upgrades of a Spacecraft Simulator," August 2019–December 2019.
– Jackson Stanthope, "Electronic and Computer upgrades of a Spacecraft Simulator" August 2018–December 2019.
– As part of a Vertically Integrated Project (VIP) course on "Active Safety Systems for Autonomous and Semi-Autonomous Vehicles" (Karen Feigh, co-advisor), started in the Fall of 2017 more than 25 undergraduate students each year, divided in several teams, participate in research while earning credit. The VIP program is an undergraduate education program by which undergraduate students joining VIP teams earn academic credit for their participation in design/discovery efforts that assist faculty and graduate students with research issues in their areas of expertise (for more details, see www.vip. gatech.edu). The teams are: multidisciplinary (drawing students from all disciplines on campus); vertically-integrated (maintaining a mix of sophomores through PhD students each semester); and long-term (each undergraduate student may participate in a project for up to three years and each graduate student may participate for the duration of their graduate career).
– As part of the Vertically Integrated Project (VIP) course on "Low-Cost Aerial Autonomy" (Ani Mazumbdar, co-advisor) started in January 2020, more than 15 undergraduate students have been involved in the design and construction of small, low-cost unmanned powered vehicles with gliding capability. The focus is on fixed-wing designs steming from a desire to exploit aggressive maneuvers and nonlinear dynamics.

## Previous Undergraduate Students

1. Zhiyuan Zhang "Small Scale Autonomous Vehicle," (PURA Undergraduate Research Fellowship), January 2020–May 2020.
2. Mason Murray-Cooper, "Electronic and Computer upgrades of a Spacecraft Simulator" January 2019–December 2019.
3. Kumal Gangoli, "Experimental Testing of Proximity Operations in Space," August 2019–December 2019.
4. Binit Shah, "Shape from Motion from Asteroid Images," August 2019–December 2019.
5. Joshua Pilipovsky, "Covariance Steering Control of Dynamic Systems," January 2019–May 2019.
6. Justin Ma, "Electronics Integration for the ASTROS Spacecraft Simulation Platform," September 2016–May 2019.
7. Frank Zhou, "Electronics Integration for the ASTROS Spacecraft Simulation Platform," September 2017–May 2018.

8. Matthew Barulic, "AutoRally: An Platform for Autonomous Ground Vehicle Testing." US Army Undergraduate Research Opportunity Program (UROP), June 2016-August 2016.

9. Justin Zheng, "AutoRally: An Platform for Autonomous Ground Vehicle Testing." US Army Undergraduate Research Opportunity Program (UROP), June 2016-August 2016 & Development of Vision Based Tracking System using Two-Point Visual Driver Model and AutoRally Platform," (PURA Undergraduate Research Fellowship), August 2017–December 2017.

10. Nialah Wilson, "AutoRally: An Platform for Autonomous Ground Vehicle Testing." US Army Undergraduate Research Opportunity Program (UROP), August 2016.

11. Michael McCracken, "Extended Kalman Filter for a Quadrotor," January 2016–May 2016.

12. Dongha, Kang, "Quadrotor Path Optimization with Artificial Potential Field," January 2016–May 2016.

13. Gabriel Nakajima, "Development of Graphical Interfacing with AR Parrot Quadrotor," January 2016–May 2016.

14. Cecilia Liu, "Graphical User Interface for Scaled Autonomous Ground Vehicle Using ROS," January 2016–May 2016.

15. Jaein Lim, "Trajectory Optimization of Quadcopter by Receding Horizon Differential Dynamic Programming in Discrete Time,"January 2016–December 2016.

16. Jack Ridderhof, "Testing ROS with NVIDIA's Jetson Board" January 2016–August 2016.

17. Meet Patel, "Slope Measurement Calibration for Spacecraft Simulator Test Area," May 2014–August 2014.

18. Zach Braun, "Automatic Mass Balancing System for a 5DOF Spacecraft Simulator Platform," January 2014–May 2014.

19. Mateus de Freitas Virgilio Pereira, "Approximate Optimal Trajectory Generation using Gaussian Stochastic Processes," August 2013–May 2014 (exchange student from Federal University Of Minas Gerais, Brasil)

20. Bhanu Kumar, "Consensus Algorithms for Multi-Agent Systems," May 2012–December 2012.

21. Yuan Yuo, "Hardware-in-the-Loop UAV Autopilot," August 2012–December 2012.

22. Chris Richardson, "A Virtual Environment for Autonomous Rendezvous and Docking in Space," May 2012–December 2012, (PURA Undergraduate Research Fellowship)

23. Ricardo Sanz Diaz, "Optimal Aggressive Vehicle Maneuvering," August 2012–December 2012 (exchange student from University of Valencia, Spain).

24. David Miculescu, "An Optimal Control Interface", August 2011-December 2011

25. Johnny Worthy, "Small scale UAV Autopilot," January 2011–August 2011

26. Luis Ignacio Reyes Castro, "Generalized Consensus Algorithms in 2D and 3D Problems," August 2009–May 2011 (REU Undergraduate Research Fellowship).

27. David Chanin, "NorthStar Localization System for a 5dof Spacecraft Simulation Platform," June 2009–August 2009.

28. Daniel Kuheme, "Numerical Optimal Control for Aerospace Applications," May 2008–September 2008 (Dash Undergraduate Research Fellowship).

29. Katie Milway, "An Optical System for High-Resolution Angular Measurement for a 3-Axis Air-Bearing Platform" May 2008–Aug. 2008

30. William Gloss, "Development and Construction for a Small UAV," Sept. 2005–Jan. 2005

31. Sean Tamblyn, "Development and Construction for a Small UAV," May 2005–Aug. 2005.

32. Daniel Jegeman, "Development of PID Controllers for a Small UAV," Sept. 2006–Dec. 2006.

33. Eiji Ozawa, "A Virtual Environment for UAV Autopilot Design," Sept. 2005–May 2006.

34. Jeffrey Staub, "Development of a GUI for a UAV Ground Station," June 2006–Dec. 2006.

35. Phillip Hom, "Development for a Simulink GUI Interface for Simulating a Half-Car Model," May 2006–August 2006.

36. Andrew Earl, "Development and Construction for a Small UAV," March 2005–Dec. 2005.

37. Jason Yu, "Adaptive Wavelet Denoising", August 2005–December 2005.

38. Brandon Lunders, "Application of an Extended Kalman Filter in UAV Autopilot Design," June 2004–May 2005 (PURA Undergraduate Research Fellowship).

39. Aurelien Drevon, "Spacecraft Autonomous Rendezvous and Docking," Aug. 2004–May 2005

40. Maria Galvis, "Autopilot Software Development for a Small UAV," Oct. 2004–May 2005

41. Terry Williams, "Design of an Autopilot for a Radio-Controlled Airplane," Oct. 2003–Dec. 2004.

42. Rebecca Fink, "Design of an Autopilot for a Radio-Controlled Airplane," Oct. 2003–May 2005.

43. Jonathan Moshe, "Design of an Autopilot for a Radio-Controlled Airplane," Oct. 2003–Dec. 2004.

44. David Lambeth, "A MATLAB Interface for Solving Two Point Boundary Value Problems using BNDSCO," NSF - REU research grant, May 2002–Dec. 2002.

45. Kriengsiri Malasri, "Experimental Stiffness Determination of the REVOLVE Active Magnetic Bearing," NSF - REU research grant, March 2002–Aug. 2002.

46. Anne Bergeron, "Computer Interface for Control of Active Magnetic Bearings," NSF - REU research grant, Feb. 2001–April 2002.

47. Aromal Prasannan, "Design of a Crane Experiment for AE4525," NSF - REU research grant, Summer 2001; exchange student from IIT, Madras.

48. Pat Kriengsiri, "Design of a Spacecraft Simulator Facility," NSF - REU research grant, Oct. 2000–Dec. 2001.

49. Emmanuel Witrant, "Applications of Linear Matrix Inequalities in Control," June 2000 – May 2001.

50. Christopher Hanlon, "Aircraft Simulator for AE 3521," NSF - REU research grant, March 1999–Aug. 2000.

51. Ancil Marshal, "Attitude Control of Small Sats using Magneto-torquers," NSF - REU research grant, March 1999–Aug. 2000.

52. Jason Stauch, "Modelling of Geomagnetic Field for an Attitude Control System," Mar. 1999–June 1999.

53. Alejandro Morin, "A Preliminary Design for a Tethered Orbiting Interferometer to Observe High Radio Frequencies," senior thesis, May 1995, Univ. of Virginia.

54. Luke Simpson, "The Design and Modelling of an Attitude Control System for a Forest Fire
Detection and Tracking Satellite," senior thesis, March 1995, Univ. of Virginia.

55. Felix Gablis-Reig, "A User-Friendly Environment for Numerical Solution of Optimal Control Problems," NSF - REU research grant, May 1997–Dec. 1997, Univ. of Virginia.

56. Andrew Turner, "Design of Autonomous and Semi-autonomous Aerospace Vehicles," Feb. 1998–Aug. 1998, Univ. of Virginia.

57. Melissa Snee, "Attitude Control of Small Sats using Magneto-torquers," NSF - REU research grant, March 1998–Aug. 1998, Univ. of Virginia.

### B. Other Teaching Activities

#### Courses Taught

Georgia Institute of Technology, Atlanta, Georgia
    School of Aerospace Engineering

    AE 3500, *Aircraft Flight Mechanics*, W99

    AE 8123, *Nonlinear Control Systems*, S99

    AE 6580, *Aerospace Nonlinear Control*, F04, S09, S12, S16, S18, S20

    AE 6511, *Optimal Guidance and Control*, F99, F01, F05, F07, F10, F11, S14, F16, S19

    AE 3521, *Aircraft and Spacecraft Flight Dynamics*, S00, S01, S02, F03, F06, S08, F13, F15

    AE 4532, *Spacecraft Flight Dynamics*, F17

    AE 3515, *System Dynamics and Control*, S04, S05, S06, S11

    AE 3531, *System Dynamics and Control*, S17

    AE 6531, *Robust Control I*, S07, S10

    AE 3510 *Flight Mechanics and Controls Laboratory*, F98, W99, S99

    AE 4525 *Control System Design Laboratory*, S05, F05, F06, F09, F10, S14

    AE 4610 *Control System Design Laboratory*, S18, F20

    AE 4380, *Astronautics*, S01

    AE 6530, *Multivariable Linear Control Systems*, F12, F18

    AE 8803TSI, *Math. Principles of Planning and Decision-Making for Autonomy*, F19, F20

    AE 8803TSI, *Advanced Nonlinear Control*, S08, F09, F12, F16

School of Engineering and Applied Science, University of Virginia, Charlottesville, Virginia
    Department of Mechanical and Aerospace Engineering

    MAE 651, *Linear Automatic Control Systems*, F97

    MAE 756/EE 726, *Nonlinear Control Systems*, S95, S97

    MAE 692, *Linear State-Space Systems and Control*, F95, F96

    MAE 853/EE 823, *Optimal Control Systems*, S96, S98

    ENGR 205, *Introduction to Solid Mechanics*, F94

Purdue University, West Lafayette, Indiana
    School of Aeronautics and Astronautics

    AAE 507, *Basic Mechanics III*, F89, F90, (Teaching Assistant)

    AAE 340, *Dynamics and Vibrations*, S90, (Teaching Assistant)

Virginia Polytechnic Institute and State University, Blacksburg, Virginia
    Department of Aerospace and Ocean Engineering

    AOE 4134, *Astromechanics*, S87, (Teaching Assistant)

    AOE 3134, *Stability & Control of Aerospace Vehicles*, F86, (Teaching Assistant)

**Courses Developed**

School of Aerospace Engineering, Georgia Institute of Technology

**AE 3521** *Aircraft and Spacecraft Flight Dynamics*

Four-credit course intended to introduce students in the flight dynamics of space-craft and aircraft. Topics covered include: review of Keplerian orbits; longitudinal statics and stability; rigid-body rotational kinematics; orientation parameters; rigid-body rotational dynamics; Euler's equations; torque-free motion; effects of energy dissipation; attitude determination and control; spin-stabilization, gravity-gradient stabilization, momentum-bias satellites; attitude sensors and actuators; gyroscopic instruments; static and dynamic stability of aircraft; small disturbance theory; stability derivatives; longitudinal static stability and control; directional stability and control; roll stability and control; stability of uncontrolled motion; stick-fixed longitudinal motion; longitudinal approximations; lateral/yaw modes of motion and approximations; longitudinal and lateral flying qualities.

**AE 8123/AE 6580** *Nonlinear Control Systems*

Graduate-level course whose objective is to introduce fundamental concepts and tools for analyzing and controlling nonlinear systems. Topics covered include: non-linear differential equations and equilibrium points; review of linear stability theory; Lyapunov stability theory; $\mathcal{L}_p$ spaces and input-output stability; small-gain theorem; relationships between I/O and Lyapunov stability; passivity concepts; absolute stability criteria; singular perturbations; variable structure control; geometric methods; input-to-state and input-output feedback linearization; control design for nonlinear systems.

**AE 8803TSI** *Advanced Nonlinear Control*

Advanced research-oriented graduate-level course for students specializing in non-linear control. Topics covered include: review real analytical and topological concepts; review of Lyapunov stability theory using $\mathcal{K}$ and $\mathcal{L}$ functions; nonlinear controllability, accessibility, observability; control Lyapunov functions; input-to-state stability; dissipativity; stabilization of cascade systems; backstepping and forwarding; Jurdjevic-Quinn approach to stabilization; necessary conditions for smooth stabilization, Brockett's condition; control of nonholonomic and underactuated systems; dilations and homogeneous norms; control of homogeneous systems; geometric methods; Lie brackets, Frobenius theorem; zero dynamics and feedback linearization; input-output linearization; center manifold theory; control of singularly perturbed systems; Hamilton-Jacobi theory; inverse optimal control.

**AE 8803TSI** *Mathematical Principles of Planning and Decision-Making for Autonomy*

Dual level graduate/advanced undergraduate level course covering all the fundamental theory to support the development of algorithms to support AI systems and intelligent machines that operate autonomously. Topics covered include: definition of an intelligent agent; reactive vs. deliberative agents; model-based vs model-free decision-making; Hamilton-Jacobi theory, the principle of optimality; LQR, DDP/iLQR, MPC methods for solving optimal control problems; search space representations, state partitioning, cell and Voronoi decompositions; elements of graph theory; uninformed graph search algorithms, depth-first and breadth-first search; informed graph search algorithms, A*, Dijkstra, D*, LPA*; sampling-based methods: PRM, RRT, RRT*; probabilistic inference, graphical models, Hidden Markov Models (HMMs); probabilistic reasoning; decision-making under uncertainty, stochastic search; Markov decision processes (MDP), partially observable MDP (POMDP); dynamic programing, value and policy iteration; approximate dynamic program-

ing; reinforcement learning and inverse reinforcement learning; adversarial agents, stochastic games, competitive MDPs; Nash and correlated equilibria; games of incomplete information, Bayesian games, bounded rationality; differential games, games of pursuit and evasion

### VIP Course on Active Safety for Autonomous Automotive Vehicles

A *Vertically Integrated Project Team (VIP)* was developed to involve undergraduate students in research. The VIP program is an undergraduate education program by which undergraduate students joining VIP teams earn academic credit for their participation in design/discovery efforts that assist faculty and graduate students with research issues in their areas of expertise (for more details, see www.vip-program.gatech.edu). The VIP teams are multidisciplinary (drawing students from all disciplines on campus); vertically-integrated (maintaining a mix of sophomores through PhD students each semester); and long-term (each undergraduate student may participate in a project for up to three years and each graduate student may participate for the duration of their graduate career). The VIP program is supported by a track of three courses, one each at the sophomore, junior and senior levels.

### VIP Course on Low Cost Aerial Autonomy

A VIP team was established with the help of Prof. Anirban Mazumdar from the School of Mechanical Engineering to investigate how small, low cost unmanned aerial vehicles can be used to deliver items, operate in constrained environments, and maximize efficiency. The team focuses on developing gliding vehicles that are catapult launched.

Department of Mechanical and Aerospace Engineering, University of Virginia

**MAE 692** *Introduction to State-Space Systems and Control*

A dual-level graduate and advanced undergraduate course in the modeling and control of linear systems. The main objective of the course is to introduce the current techniques and tools for the analysis, description and feedback control of multivariable linear systems. Emphasis is given to linear algebra concepts and the use of computer packages (e.g. MATLAB) for the solution of these problems. Topics covered include: models of physical systems; equilibrium points, solutions and linearization; state-space vs. transfer function matrix models; vectors and vector spaces; linear mappings and adjoint operators; eigenvalues, eigenvectors, Jordan normal forms; null space and range of a matrix; linear matrix equations and least squares theory; realizations, Kalman canonical forms; stability, Lyapunov equation; controllability and observability grammians; state feedback; output feedback and observer design; model reduction.

### Laboratory Developed

DYNAMICS AND CONTROL SYSTEMS LABORATORY. Through an NSF CAREER award, DCSL was established in 1996 to train both graduate and undergraduate students in the analysis and control of dynamical systems. A variety of software is available (MATLAB, SIMULINK, DSTOOLS, STK, FLIGHT GEAR, etc) running on high-end workstations. Electronic instrumentation includes standard equipment (power supplies, oscilloscopes, function generators, multimeters) and specialized dSPACE 1103 controller boards with the associated software. Experiments include a 15,000 rpm flexible shaft supported on active magnetic bearings, a flywheel supported on active/passive magnetic bearings, a wheeled mobile robot and an unmanned aerial vehicle (UAV) platform. The lab also has a Flight Simulator for evaluating flight control system responses.

SPACECRAFT ROBOTICS LABORATORY. Through two AFOSR DURIP awards to-talling approximately $500K, a 5-dof experimental rendezvous and docking facility was established in 2008 in the basement of the Montgomery Knight Building (MK-111). The spacecraft platform floats on a set of three linear and a hemispherical air-bearing, allowing unrestricted translation along the $x$ and $y$ axes, and $\pm 30$ deg rotations about the $x$ and $y$ axes, and $\pm 360$ deg rotation about the $z$ axis. The test arena, made of hardened epoxy, has dimensions 14 ft $\times$ 14 ft. A plethora of sensors (rate gyros, magnetometer, 3-axes acceleromaters, IMU, CCD cameras, lidars) and actuators (12 thrusters, 4 variable speed CMGs) onboard the spacecraft platform allow for the realistic validation of a wide variety of space proximity operations scenarios.

## Instructional Material Developed

AE 4520/AE4525: Feedback Control Systems Lab: An updated, significantly improved, laboratory manual was developed for the laboratory part of the course. A new 3-axis spacecraft simulator was designed and included in the lab series experiments.

AE 3521: Spacecraft and Aircraft Flight Dynamics: An aircraft simulator has been incorporated in the class via funds provided by the School of Aerospace Engineering and the Teaching Fellows Program at GIT.

## Graduate Student Advisory Committees

Georgia Institute of Technology

Jared Elinger (December 2019)
Julian Brew, Doctor of Philosophy (December 2019)
Brian Goldfein, Doctor of Philosophy/CS (May 2019)
Raphael Cohen, Doctor of Philosophy (December 2018)
Patrick Hyun, Doctor of Philosophy/ECE (May 2018)
Emmanuel Boidot, Doctor of Philosophy (December 2017)
Guangcong Zhang, Doctor of Philosophy/ECE (December 2015)
Daniel Magree, Doctor of Philosophy (May 2015)
Timothy Wang, Doctor of Philosophy (May 2015)
Claus Christmann, Doctor of Philosophy (May 2015)
Sang Gyun Park Doctor of Philosophy (August 2014)
Duy-Nguyen Ta, Doctor of Philosophy/CS (May 2014)
Gaurav Agrawal, Doctor of Philosophy/ChBE (December 2014)
Richard Roberts, Doctor of Philosophy/CS (May 2014)
Jason Bentley, Doctor of Philosophy/ChBE (May 2013)
Brad Steinfeldt, Doctor of Philosophy (December 2013)
Clayton Tino, Doctor of Philosophy (May 2013)
Yibiao Lu, Doctor of Philosophy/ISyE (December 2012)
McClain Evan, Doctor of Philosophy (December 2012)
Peter Kingston, Doctor of Philosophy/ECE (May 2012)
Michael Grant, Doctor of Philosophy (May 2012)
Tansel Yucelen, Doctor of Philosophy (May 2012)
Girish Chowdhary, Doctor of Philosophy (December 2010)

Konstantyn Volyanskyy, Doctor of Philosophy (May 2010)
Kristina Alemany, Doctor of Philosophy (December 2009)
Gidado-Yisa Immanuel, Doctor of Philosophy (May 2009)
Qing Hui, Doctor of Philosophy (December 2008)
Keumjin Li, Doctor of Philosophy (December 2007)
Yoko Watanabe, Doctor of Philosophy (December 2007)
Shannon Twigg, Doctor of Philosophy (May 2007)
John Huey, Doctor of Philosophy/ME (August 2006)
Ali Kutay, Doctor of Philosophy (December 2005)
Sergei Nesterov, Doctor of Philosophy (August 2005)
Julide Topsakal, Master of Science (May 2005)
Gregory Dukeman, Doctor of Philosophy (December 2004)
David May, Doctor of Philosophy (May 2002)
David W. Way, Doctor of Philosophy (December 2001)
Manu Sharma, Doctor of Philosophy (May 2001)
Erika Ooten, Master of Science (December 2000)
Irene Budianto, Doctor of Philosophy (August 2000)
Joseph Corrado, Doctor of Philosophy (August 2000)
Eric Johnson, Doctor of Philosophy (December 2000)
Flavio Nardi, Doctor of Philosophy (December 2000)

University of Virginia

James Masters, Doctor of Philosophy (August 1998)
Edward Weller, Doctor of Philosophy (May 1998)
Stephen Fedigan, Doctor of Philosophy (May 1998)
Yi Ling, Doctor of Philosophy (Aug. 1998)
Xiao Yang, Master of Science (July 1997)
Zhenghong Wu, Doctor of Philosophy (May 1997)
Ming Tian, Doctor of Philosophy (May 1997)
Ravichandran Vancheeswaran, Doctor of Philosophy (May 1996)
Shannon Young, Master of Science (May 1996)

External Reader

Barbara Savini, Doctor of Philosophy, Polytecnico di Milano (May 2007)
Perdo Pereira, Doctor of Philosophy, KTH (February 2019)
Marco Baur, Doctor of Philosophy, Polytecnico di Milano (October 2019)
Ramon Andreu Altava, Airbus/ENAC (February 2020)

## IV. Scholarly Accomplishments

### A. Books and Book Chapters

1. Bernstein D. S. and Tsiotras, P., *A Course in Classical Optimal Control*, (in preparation).
2. Tsiotras, P., "Invariant Manifold Techniques for Control of Underactuated Mechanical Systems," in *Modelling and Control of Mechanical Systems*, Eds: A. Astolfi, D. Limebeer, C. Melchiorri, A. Tornambe, and R. Vinter, World Scientific, London, 1997, pp. 277–292.

3. Tsiotras, P., "Attitude Controls," in *Encyclopedia of Electrical and Electronics Engineering*, John Wiley & Sons, New Jersey, 1999; revised and updated in 2014.

4. Canudas de Wit, C., R. Horowitz, and P. Tsiotras, "Model-Based Observer for Tire/Road Contact Friction Prediction," in *New Directions in Nonlinear Observer Design*, Eds: Nijmeijer, H. and T.L. Fossen, *Lecture Notes in Control and Information Science*, Vol. 244, Springer-Verlag, London, May 1999, pp. 23–42.

5. C. Canudas-de-Wit, P. Tsiotras, X. Claeys, J. Yi, and R. Horowitz, "Friction Tire/Road Modeling, Estimation and Optimal Braking Control," in *Nonlinear and Hybrid Systems in Automotive Control*, Eds: Rolf Johansson and Anders Rantzer, *Lecture Notes in Control and Information Science*, Springer-Verlag, London, October 2002, pp. 165–229.

6. Tsiotras, P. and Reyes Castro L. I., "A Note on the Consensus Protocol with Some Applications to Agent Orbit Pattern Generation," in *Distributed Autonomous Robotic Systems*, Eds: A. Martinoli, F. Mondada, N. Correll, G. Mermoud, M. Egerstedt, M. Ani Hsieh, L. E. Parker, and K. Støy, *Springer Tracts in Advanced Robotics*, Vol. 83, Springer-Verlag, Berlin, 2013, pp. 345–358, doi: 10.1007/978-3-642-32723-0_25

7. Tsiotras, P. and Reyes Castro L. I., "The Artistic Geometry of Consensus Protocols," in *Controls and Art*, Eds: M. Egerstedt and A. LaViers, *Springer Lectures Notes on Computer Science*, 2014, pp. 129–153, doi: 10.1007/978-3-319-03904-6_6

8. Tsiotras, P. and Sanz-Diaz R. "Real-Time Near-Optimal Feedback Control of Aggressive Vehicle Maneuvers," in *Optimization and Optimal Control in Automotive Systems*, Eds: H. Waschl, I. Kolmanovky, M. Steinbuch and L. del Re, *Springer Lecture Notes in Control and Information Sciences*, Vol. 455, March 2014, pp. 109–129, doi: 10.1007/978-3-319-05371-4_7

9. Delahaye, D., Puechmorel, S., Feron, E., and Tsiotras, P., "Mathematic Models for Aircraft Trajectory Design : A Survey," in *Air Traffic Management and Systems*, Eds: Electronic Navigation Research Institute, *Lecture Notes in Electrical Engineering*, February 2014, Vol. 290, pp. 205–247, Springer, Japan, doi: 10.1007/978-4-431-54475-3_12

10. Filipe, N., Kontitsis, M., and Tsiotras, P., "From Attitude to Pose Estimation Using Dual Quaternions," in *Recent Advances on Multisensor Attitude Estimation: Fundamental Concepts and Applications*, Ed: Hassen Fourati, *Devices, Circuits and Systems Series*, CRC Press, June 2016.

11. Tsiotras, P., "Bounded Rationality in Learning, Perception, Decision-Making, and Stochastic Games," in *Handbook of Reinforcement Learning and Control*, Ed: K. Vamvoudakis, Y. Wan, , F. Lewis, D. Canseve, *Studies in Systems, Decision and Control Series*, Springer, 2020.

## B. Journal Publications

1. Tsiotras, P., and Kelley, H. J., "Drag-Law Effects in the Goddard Problem," *Automatica*, Vol. 27, pp. 481–490, May 1991.

2. Tsiotras, P., and Kelley, H. J., "The Goddard Problem with Constrained Time-of-Flight," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 15, No. 2, pp. 289–296, March-April 1992.

3. Tsiotras, P., and Longuski, J. M., "A Complex Analytic Solution for the Attitude Motion of a Near-Symmetric Rigid Body Under Body-Fixed Torques," *Celestial Mechanics and Dynamical Astronomy*, Vol. 51, pp. 281–301, 1991.

4. Longuski, J. M., and Tsiotras P., "Analytic Solutions for a Spinning Rigid Body Subject to Time-Varying Body-Fixed Torques. Part I: Constant Axial Torque," *ASME Journal of Applied Mechanics*, Vol. 60, pp. 970–975, 1993.

5. Tsiotras, P., and Longuski, J. M., "Analytic Solutions for a Spinning Rigid Body Subject to Time-Varying Body-Fixed Torques. Part II: Time-Varying Axial Torque," *ASME Journal of Applied Mechanics*, Vol. 60, pp. 976–981, 1993.

6. Tsiotras, P., and Longuski, J. M., "New Kinematic Relations for the Large Angle Problem in Rigid Body Attitude Dynamics," *Acta Astronautica*, Vol. 32, No. 3, pp. 181–190, 1994.

7. Tsiotras, P., and Longuski, J.M., "Spin-Axis Stabilization of Symmetric Spacecraft with Two Control Torques," *Systems & Control Letters*, Vol. 23, pp. 395–402, 1994.

8. Tsiotras, P., Corless M., and Longuski, J. M., "A Novel Approach to the Attitude Control of an Axisymmetric Spacecraft," *Automatica*, Vol. 31, No. 8, pp. 1099–1112, 1995.

9. Longuski, J.M., Puig-Suari, J., Tsiotras, P., and Tragesser, S., "Optimal Mass for Aerobraking Tethers," *Acta Astronautica*, Vol. 35, No. 8, pp. 489–500, 1995.

10. Longuski, J. M., and Tsiotras, P., "Analytic Solution of the Large Angle Problem in Rigid Body Attitude Dynamics," *Journal of the Astronautical Sciences*, Vol. 43, No. 1, pp. 25–46, 1995.

11. Schaub, H., Tsiotras, P., and Junkins, J.L., "Principal Rotation Representations of Proper $N \times N$ Orthogonal Matrices," *International Journal of Engineering Science*, Vol. 33, No. 15, pp. 2277–2295, 1995.

12. Tsiotras, P., and Longuski, J.M., "A New Parameterization of the Attitude Kinematics," *Journal of the Astronautical Sciences*, Vol. 43, No. 3, pp. 243–262, 1995.

13. Tsiotras, P., and Longuski, J.M., "Analytic Solution of Euler's Equations of Motion for an Asymmetric Rigid Body," *ASME Journal of Applied Mechanics*, Vol. 63, No. 1, pp. 149–155, 1996.

14. Tsiotras, P., Rotea, M., and Corless, M., "Counter-example to a Recent Result on the Stability of Nonlinear Systems," *IMA Journal of Mathematics, Control & Information*, Vol. 13, No. 2, pp. 129–130, 1996.

15. Tsiotras, P., "Stabilization, and Optimality Results for the Attitude Control Problem," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 19, No. 4, pp. 772–779, 1996.

16. Wan, C.J., Tsiotras, P., Bernstein, D.S., and V.T. Coppola, "Global Asymptotic Stabilization of a Spinning Top with Torque Actuators using Stereographic Projection," *Dynamics and Control*, Vol. 7, No. 3, pp. 215–233, 1997.

17. Tsiotras, P., "Optimal Regulation and Passivity Results for Axi-Symmetric Rigid Bodies with Two Controls," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 20, No. 3, pp. 457–463, 1997.

18. Tsiotras, P., Junkins, J. L., and Schaub, H., "Higher Order Cayley-Transforms with Applications to Attitude Representations," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 20, No. 3, pp. 528–534, 1997.

19. Tsiotras, P., and Luo, J., "Reduced Effort Control Laws for Underactuated Rigid Spacecraft," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 20, No. 6, pp. 1089–1095, 1997.

20. Rotea, M., Tsiotras, P., and Corless, M., "Suboptimal Control of Rigid Body Motion with a Quadratic Cost," *Dynamics and Control*, Vol. 8, No. 1, pp. 55–81, 1998.

21. Tsiotras, P., Corless, M., and Rotea, M., "Optimal Control of Rigid Body Angular Velocity with Quadratic Cost," *Journal of Optimization Theory and Applications*, Vol. 96, No. 3, pp. 507–532, 1998.

22. Tsiotras, P., Corless, M., and Rotea, M., "An $\mathcal{L}_2$ Disturbance Attenuation Solution to the Nonlinear Benchmark Problem," *International Journal of Robust and Nonlinear Control*, Vol. 8, pp. 311–330, 1998.

23. Tsiotras, P., "Further Passivity Results for the Attitude Control Problem," *IEEE Transactions on Automatic Control*, Vol. 43, No. 11, pp. 1597–1600, 1998.

24. Yang, C., Knospe, C., and Tsiotras, P., "Optimal Control of a Magnetic Bearing without Bias and Saturating Voltages," *Optimal Control Applications and Methods*, Vol. 19, pp. 227–246, 1998.

25. Luo, J., and Tsiotras, P., "Exponentially Convergent Control Laws for Nonholonomic Systems in Power Form," *Systems & Control Letters*, Vol. 35, pp. 87–95, 1998.

26. Krstić, M., and Tsiotras, P., "Inverse Optimal Stabilization of a Rigid Spacecraft," *IEEE Transactions on Automatic Control*, Vol. 44. No. 5, pp. 1042–1049, 1999.

27. Shen, H., and Tsiotras, P., "Time-Optimal Control of Axi-symmetric Spacecraft with Two Controls ," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 22, No. 5, pp. 682–694, 1999.

28. Luo, J., and Tsiotras, P., "Control Design for Chained-Form Systems with Bounded Inputs," *Systems & Control Letters*, Vol. 39, pp. 123–131, 2000.

29. Tsiotras, P. and Luo, J., "Control of Underactuated Spacecraft with Bounded Inputs," *Automatica*, Vol. 36, No. 8, pp. 1153–1169, 2000.

30. Tsiotras, P. and Doumtchenko, V., "Control of Spacecraft Subject to Actuator Failures: State-of-the-Art and Open Problems," *Journal of the Astronautical Sciences*, Vol. 48, Nos. 2 and 3, pp. 337–358, 2000, doi:10.1007/BF03546283

31. Tsiotras, P. "A Discussion on the paper 'Attitude Control of Underactuated Spacecraft' by K. Spindler," *European Journal on Control*, Vol. 6, No. 3, pp. 243, 2000.

32. Tsiotras, P., Shen, H. and Hall, C., "Satellite Attitude Control and Power Tracking with Momentum Wheels," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 24, No. 1, pp. 23-34, 2001.

33. Zhang, J., Knospe, C. and Tsiotras, P., "Stability of Time Delay Systems: Equivalence Between Lyapunov and Scaled Small-Gain Conditions," *IEEE Transactions on Automatic Control*, Vol. 46, No. 3, pp. 482–486, 2001, doi:10.1109/9.911428.

34. Zhang X., Tsiotras, P., and Knospe, C., " Stability Analysis for LPV Time-Delayed Systems," *International Journal of Control*, Vol. 75, No. 7, pp. 538-558, 2002.

35. Kim, B., and Tsiotras, P., "Controllers for Unicycle-Type Wheeled Robots: New Theoretical Results and Experimental Validation" *IEEE Transactions on Robotics and Automation*, Vol. 18, No. 3, pp. 294-307, 2002, doi:10.1109/TRA.2002.1019460.

36. Yoon, H. and Tsiotras, P. "Spacecraft Adaptive Attitude Control And Power Tracking With Single-Gimballed Variable Speed Control Moment Gyroscopes," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 25, No. 6, pp. 1081–1090, 2002.

37. Canudas de Wit, C., Tsiotras, P., Velenis, E., Basset, M. and Gissinger, G., "Dynamic Friction Models for Road/Tire Longitudinal Interaction," *Vehicle System Dynamics*, Vol. 39, No. 3, pp. 189-226, 2003.

38. Shen, H. and Tsiotras, P., "Optimal Two-Impulse Rendezvous Between Two Circular Orbits Using Multiple-Revolution Lambert's Solutions," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 26, No. 1, pp. 50–61, 2003.

39. Hall, C., Tsiotras, P. and Shen, H., "Tracking Rigid Body Motion Using Thrusters and Momentum Wheels," *Journal of the Astronautical Sciences*, Vol. 50, No. 3, pp. 311–323, 2003.

40. Kim, B., Velenis, E., Kriengsiri, P. and Tsiotras, P., "Designing a Low-Cost Spacecraft Simulator," *IEEE Control Systems Magazine*, Vol. 23, No. 3, pp. 26–37, 2003, doi:10.1109/MCS.2003.1213601.

41. Zhang, J., Knospe C., and Tsiotras, P., "New Results for the Analysis of Linear Systems with Time-Invariant Delays," *International Journal on Robust and Nonlinear Control*, Vol. 13, No. 12, pp. 1149–1175, 2003, doi:10.1002/rnc.834

42. Tsiotras, P. and Wilson, B.C., "Zero- and Low-Bias Control Designs for Active Magnetic Bearings," *IEEE Transactions on Control Systems Technology*, Vol. 11, No. 6, pp. 889–904, 2003, doi:10.1109/TCST.2003.819593.

43. Yoon, H. and Tsiotras, P., "Singularity Analysis of Variable Speed Control Moment Gyros," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 27, No. 3, pp. 374–386, 2004.

44. Tsiotras, P., Velenis E. and Sorine, M., "A LuGre Tire Friction Model with Exact Aggregate Dynamics," *Vehicle System Dynamics*, Vol. 42, No. 3, pp. 195–210, 2004.

45. Tsiotras, P., "The Relation Between the 3-D Bode Plot and the Root Locus," *IEEE Control Systems Magazine*, Vol. 25, No. 1, pp. 88–96, 2005, doi:10.1109/MCS.2005.1388807

46. Tsiotras, P. and Arcak, M., "Low-Bias Control of AMB Subject to Voltage Saturation: State-Feedback and Observer Designs," *IEEE Transactions on Control Systems Technology*, Vol. 13, No. 2, pp. 262–273, 2005, doi:10.1109/TCST.2004.839562

47. Velenis, E., Tsiotras, P., Canudas de Wit, C. and Sorine, M., "Dynamic Tire Friction Models for Combined Longitudinal and Lateral Vehicle Motion," *Vehicle System Dynamics*, Vol. 43, No. 1, pp. 3–29, 2005.

48. Lanzon, A. and Tsiotras, P., "A Combined Application of $\mathcal{H}_\infty$ Loop-Shaping and $\mu$-Synthesis to Control High Speed Flywheels," *IEEE Transactions of Control Systems Technology*, Vol. 13, No. 5, pp. 766–777, 2005, doi:10.1109/TCST.2005.847344

49. Shen H. and Tsiotras, P., "Peer-to-Peer Refueling for Circular Satellite Constellations," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 28, No. 6, pp. 1220–1230, 2005.

50. Tsiotras, P. and P.-A. Bliman, "An Exact Stability Analysis Test for Single-Parameter Polynomially-Dependent Linear Systems," *IEEE Transactions on Automatic Control*, Vol. 51, No. 7, pp. 1161–1164, 2006.

51. Dutta, A., and Tsiotras, P., "Asynchronous Optimal Mixed P2P Satellite Refueling Strategies," *Journal of the Astronautical Sciences*, Vol. 54, No. 3-4, pp. 543–565, 2006.

52. Zhang, X., Lanzon, A. and Tsiotras, P., "An Approach for Computing the Exact Stability Domain for a Class of LTI Parameter Dependent Systems," *International Journal of Control*, Vol. 79, No. 9, pp. 1046–1061, 2006, doi:10.1080/00207170600747283

53. Yoon, H., and Tsiotras, P., "Spacecraft Line-of-Sight Control Using a Single-Gimbal Variable-Speed Control Moment Gyro," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 29, No. 6, pp. 1295–1308, 2006.

54. Chaplais, F., Tsiotras, P. and Jung, D., "Redundant Wavelet Processing on the Half-Axis with Applications to Signal Denoising with Small Delays: Theory and Experiments," *International Journal on Adaptive Control and Signal Processing*, Vol. 20, No. 9, pp. 447–474, 2006, doi:10.1002/acs.911

55. Dutta, A., and Tsiotras, P., "An Egalitarian Peer-to-Peer Satellite Refueling Strategy," *AIAA Journal of Spacecraft and Rockets*, Vol. 45, No. 3, pp. 608–618, 2008.

56. Jain, S. and Tsiotras, P., "Multiresolution-Based Direct Trajectory Optimization," *AIAA Journal of Guidance Control, and Dynamics*, Vol. 31, No. 5, pp. 1424–1436, 2008.

57. Yoon, H. and Tsiotras, P., "Adaptive Spacecraft Attitude Tracking Control with Actuator Uncertainties," *Journal of the Astronautical Sciences*, Vol. 56, No. 2, pp. 251–268, 2008.

58. Velenis, E., and Tsiotras P., "Minimum-Time Travel for a Vehicle with Acceleration Limits: Theoretical Analysis and Receding Horizon Implementation," *Journal of Optimization Theory and Applications*, Vol. 138, No. 2, pp. 275–296, 2008, doi:10.1007/s10957-008-9381-7.

59. Velenis, E., Tsiotras, P., and Lu, J., "Optimality Properties and Driver Input Parameterization for Trail-Braking Cornering," *European Journal of Control*, Vol. 14, No. 4, pp. 308–320, 2008, doi: 10.3166/EJC.14.308-320.

60. Jung, D., Ratti, J., and Tsiotras, P., "Real-time Implementation and Validation of a New Hierarchical Path Planning Scheme for UAVs via Hardware-in-the-Loop Simulation," *Journal of Intelligent and Robotic Systems*, Vol. 54, No. 1, pp. 163–181, 2009, doi: 10.1007/s10846-008-9255-0.

61. Jain, S., Tsiotras, P., and Zhou, H.-M., "Adaptive Multiresolution Mesh Refinement for the Solution of Evolution PDEs," *SIAM Journal of Scientific Computing*, Vol. 31, No. 2, pp. 1221–1248, 2009, doi: 10.1137/070708329

62. Jain, S., and Tsiotras, P., "Sequential Multiresolution Trajectory Optimization Schemes for Problems with Moving Targets," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 32, No. 2, pp. 488–499, 2009.

63. Dutta, A., and Tsiotras, P., "Hohmann-Hohmann and Hohmann-Phasing Cooperative Rendezvous Maneuvers," *Journal of the Astronautical Sciences*, Vol. 57, Nos. 1–2, pp. 393–417, January–June 2009.

64. Dimarogonas, D. V., Tsiotras, P., and Kyriakopoulos, K. K., "Leader-Follower Cooperative Attitude Control of Multiple Rigid Bodies," *Systems and Control Letters*, Vol. 58, No. 6, pp. 429–435, 2009.

65. Dutta, A., and Tsiotras, P., "A Network Flow Formulation for Cooperative Peer-to-Peer Refueling Strategies," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 33, No. 5, pp. 1539–1549, 2010. doi: 10.2514/1.45570

66. Velenis, E., Frazzoli, E., and Tsiotras P., "Steady-State Cornering Equilibria and Stabilization for a Vehicle During Extreme Operating Conditions," *International Journal of Vehicle Autonomous Systems*, Vol. 8, Nos. 2–4, pp. 217–241, 2010, doi:10.1504/IJVAS.2010.035797.

67. Tsiotras, P., Zhang, X., and Iwasaki, T., "Lyapunov-Based Exact Stability Analysis and Synthesis for Single-Parameter Dependent Systems," *International Journal of Control*, Vol. 83, No. 9, pp. 1823–1838, 2010, doi:10.1080/00207179.2010.497544.

68. Bakolas, E. and Tsiotras, P., "The Zermelo-Voronoi Diagram: a Dynamic Partition Problem," *Automatica*, Vol. 46, No. 12, pp. 2059-2067, 2010. doi:10.1016/j.automatica.2010.09.003

69. Zhao, Y. and Tsiotras, P., "Mesh Refinement for Solving Optimal Control Problems Using Grid Density Functions," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 34, No. 1, pp. 271–277, 2010, doi:10.2514/1.45852

70. Bakolas, E., and Tsiotras, P., "Optimal Synthesis of the Asymmetric Sinistral/Dextral Markov-Dubins Problem," *Journal of Optimization Theory and Applications*, Vol. 150, No. 2, pp. 233–250, Aug. 2011. doi:10.1007/s10957-011-9841-3

71. Lu, Y., Huo, X., Arslan, O., and Tsiotras, P., "An Incremental, Multi-Scale Search Algorithm for Dynamic Path Planning with Low Worst Case Complexity," *IEEE Transactions on Man, Systems and Cybernetics, Part B: Cybernetics*, Vol. 41, No. 6, pp. 1556–1570, Dec. 2011, doi: 10.1109/TSMCB.2011.2157493

72. Velenis, E., Katzourakis, D., Frazolli, E., Tsiotras, P. and Happee, R., "Steady-State Drifting Stabilization of RWD Vehicles," *Control Engineering Practice*, Vol. 19, No. 11, Nov. 2011, pp. 1363–1376, doi:10.1016/j.conengprac.2011.07.010.

73. Tsiotras, P., Jung, D., and Bakolas, E., "Multiresolution Hierarchical Path-Planning for Small UAVs Using Wavelet Decompositions," *Journal of Intelligent and Robotic Systems*, Vol. 66, No. 4, pp. 505–522, June 2012. doi:10.1007/s10846-011-9631-z

74. Cowlagi, R. and Tsiotras, P., "Hierarchical Motion Planning with Kinodynamic Feasibility Guarantees," *IEEE Transactions on Robotics*, Vol. 28, No. 2, pp. 379–395, April 2012, doi:10.1109/TRO.2011.2171613

75. Lu, Y., Huo, Y., and Tsiotras, P., "A Beamlet-Based Graph Structure for Path Planning Using Multiscale Information," *IEEE Transactions on Automatic Control*, Vol. 57 , No. 5, pp. 1166–1178, May 2012, doi:10.1109/TAC.2012.2191836

76. Bakolas, E. and Tsiotras, P., "Feedback Navigation in an Uncertain Flow-Field and Connections with Pursuit Strategies," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 35, No. 4, pp. 1268–1279, July-August 2012, doi:10.2514/1.54950

77. Coene, S., Dutta, A., Spiekma, F. and Tsiotras, P., "On the Computational Complexity of Peer-to-Peer Satellite Refueling Strategies," *Information Systems and Operational Research*, Vol. 50, No. 2, pp. 88–94, May 2012, doi:10.3138/infor.50.2.088

78. Cowlagi, R., and Tsiotras, P., "Multiresolution Path- and Motion Planning for Autonomous Agents via Wavelet-Based Cell Decompositions," *IEEE Transactions on Systems Man and Cybernetics, Part B: Cybernetics*, Vol. 42, No. 5, pp. 1455–1469, October 2012, doi:10.1109/TSMCB.2012.2192268

79. Bakolas, E., and Tsiotras, P., "Relay Pursuit of a Maneuvering Target Using Dynamic Voronoi Diagrams," *Automatica*, Vol. 48, pp. 2213–2220, Aug. 2012, doi:10.1016/j.automatica.2012.06.003

80. Watts, R., Johnson, E., Feigh, K., and Tsiotras, P., "Development and Evaluation of an Automated Path Planning Aid," *AIAA Journal of Aircraft*, Vol. 49, No. 6, pp. 1774–1785, Nov.-Dec. 2012, doi:10.2514/1.C031513

81. Zhao, Y., and Tsiotras, P., "Time-Optimal Path Following for Fixed-Wing Aircraft," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 36, No. 1, pp. 83–95, January-February 2013, doi: 10.2514/1.57471

82. Zhao, Y., and Tsiotras, P., "Analysis of Energy-Optimal Aircraft Landing Operation Trajectories," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 36, No. 3, pp. 833–845, May-June 2013, doi:10.2514/1.57779

83. Bakolas, E. and Tsiotras, P., "Optimal Synthesis of the Zermelo–Markov–Dubins Problem in a Constant Drift Field," *Journal of Optimization Theory and Applications*, Vol. 156, No. 2, pp. 469–492, 2013, doi:10.1007/s10957-012-0128-0

84. Anderson, R., Bakolas, E., Milutinović, D., and Tsiotras, P., "Optimal Feedback Guidance of a Small Aerial Vehicle in a Stochastic Wind," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 36, No. 4, pp. 975–985, July-August 2013, doi: 10.2514/1.59512

85. Jung, D., and Tsiotras, P., "On-line Path Generation for Unmanned Aerial Vehicles Using B-Spline Path Templates," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 36, No. 6 pp. 1642–1653, October 2013, doi: 10.2514/1.60780

86. Bakolas, E. and Tsiotras, P., "Optimal Partitioning for Spatiotemporal Coverage in a Drift Field," *Automatica*, Vol. 49, No. 7, pp. 2064–2073, July 2013, doi: 10.1016/j.automatica.2013.04.013

87. Cowlagi, R., and Tsiotras, P., "Curvature-Bounded Traversability Analysis for Motion Planning of Mobile Robots," *IEEE Transactions on Robotics*, Vol. 30, No. 4, pp. 1011–1019, August 2014, doi: 10.1109/TRO.2014.2315711

88. Kim, B., and Tsiotras, P., and Hong, J.-M., and Song, O.-Y. "Interpolation and Parallel Adjustment of Center-Sampled Trees With New Balancing Constraints," *The Visual Computer*, September 2014, doi: 10.1007/s00371-014-1018-2

89. Filipe, N., and Tsiotras, P., "Adaptive Position and Attitude Tracking Controller for Satellite Proximity Operations using Dual Quaternions," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 38, No. 4, pp. 566–577, April 2015, doi:10.2514/1.G000054

90. Exarchos, I., and Tsiotras, P., and Pachter, M., "On the Suicidal Pedestrian Differential Game," *Dynamic Games and Applications*, Vol. 5, No. 3, pp 297–317, September 2015, doi:10.1007/s13235-014-0130-2

91. Zhang, G., Kontitsis, M., Filipe, N., Tsiotras, P., and Vela, P., "Cooperative Relative Navigation for Space Rendezvous and Proximity Operations Using Controlled Active Vision," *Journal of Field Robotics*, Vol. 33, No. 2, pp. 205-228, March 2016, doi:10.1002/rob.21575

92. Filipe, N., Kontitsis, M., and Tsiotras, P., "Multiplicative Extended Kalman Filter for Spacecraft Pose Estimation Using Dual Quaternions," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 38, No. 9, pp. 1625–1641, October 2015, doi:10.2514/1.G000977

93. Filipe, N., Valverde, A., and Tsiotras, P., "Pose-Tracking Without Linear and Angular Velocity Feedback Using Dual Quaternions," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 52, No. 1, pp. 411–422, February 2016, doi:10.1109/TAES.2015.150046

94. Tsiotras, P., and Mesbahi, M., "Toward an Algorithmic Control Theory," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 40, No. 2, pp. 194–196, February 2017, doi:10.2514/1.G002754

95. Sun, W., Tsiotras, P., Lolla, T., Subramani, D., and Lermusiaux, P., "Multiple-Pursuer-One-Evader Pursuit Evasion Game in Dynamic Flow Fields," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 40, No. 7, pp. 1627–1637, July 2017, doi:10.2514/1.G002125

96. Sun, W., and Tsiotras, P., "Sequential Pursuit of Multiple Targets Under External Disturbances via Zermelo-Voronoi Diagrams ," *Automatica*, Vol. 81, pp. 253–260, July 2017, doi:10.1016/j.automatica.2017.03.015

97. You, C., Lu, J., and Tsiotras, P., "Nonlinear Driver Parameter Estimation and Driver Steering Behavior Analysis for ADAS using Field Test Data," *IEEE Transactions on Human-Machine Systems*, Vol. 47, No. 5, pp. 686–699, October 2017. doi:10.1109/THMS.2017.2727547

98. Zhao, Y., Dutta, A., Tsiotras, P., and Costello, M., "Optimal Aircraft Trajectories for Wind Energy Extraction," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 41, No. 2, pp. 488–496, 2018. doi:10.2514/1.G003048

99. Makkapati, V, R., Sun, W., and Tsiotras, P., "Optimal Evading Strategies for Two-Pursuers One-Evader Problems," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 41, No. 4, pp. 851–862, 2018, doi:10.2514/1.G003070

100. Okamoto, K., Goldshtein, M., and Tsiotras, P., "Optimal Covariance Control for Stochastic Systems Under Chance Constraints," *IEEE Control Systems Letters*, Vol. 2, No. 2, pp. 266–271, 2018, doi:10.1109/LCSYS.2018.2826038

101. Goldfain, B., Drews, P., You, C., Barulic, M., Velev, O., Tsiotras, P., Rehg, J. M., "AutoRally: An Open Platform for Aggressive Autonomous Driving," *IEEE Control Systems Magazine*, Vol. 39, No. 1, pp. 26–55, 2019, doi:10.1109/MCS.2018.2876958

102. Exarchos, I., Theodorou, E., and Tsiotras, P., "Stochastic Differential Games - A Sampling Approach via FBSDEs," *Dynamic Games and Applications*, Vol. 9, No. 2, pp. 486–505, 2019, doi:10.1007/s13235-018-0268-4

103. Exarchos, I., Theodorou, and Tsiotras, P., "$L^1$-Optimal Control via Forward and Backward Stochastic Differential Equations," *Systems and Control Letters*, Vol. 118, pp. 101–108, 2018, doi:10.1016/j.sysconle.2018.06.005

104. Brewer, J. M., and Tsiotras, P., "Partial Attitude Synchronization for Networks of Underactuated Spacecraft," *Automatica*, Vol. 97, pp. 26–37, 2018, doi:10.1016/j.automatica.2018.07.025

105. Antonello, A., Valverde, A., and Tsiotras, P., "Dynamics, Control, and Trajectory Tracking of Spacecraft Manipulators with Thrusters and Momentum Exchange Devices," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 42, No.1, pp. 15–29, 2019, doi:10.2514/1.G003601

106. Sun, W., Pan, Y., Theodorou, E., and Tsiotras, P., "Min-Max Differential Dynamic Programming: Continuous and Discrete Time Formulations," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 41, No. 12, pp. 2568-2580, 2018, doi: 10.2514/1.G003516

107. Exarchos, I., Theodorou, E., and Tsiotras, P., "Optimal Thrust Profile for Planetary Soft Landing under Stochastic Disturbances," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 42, No.1, pp. 209–216, 2019, doi:10.2514/1.G003598

108. Valverde, A., and Tsiotras, P., "Spacecraft Robot Kinematics Using Dual Quaternions," *Robotics*, Vol. 7, 64, 2018, doi:10.3390/robotics7040064

109. Valverde, A., and Tsiotras, P., "Dual Quaternion Framework for Spacecraft-Mounted Multi-body Robotic Systems," *Frontiers in Robotics and AI: Space Robotics*, November 2018, doi:10.3389/frobt.2018.00128

110. You, C., Lu, J., Filev, D., and Tsiotras, P., "Advanced Planning for Autonomous Vehicles Using Reinforcement Learning and Deep Inverse Reinforcement Learning," *Robotics and Autonomous Systems*, Vol. 114, pp. 1–18, April 2019, doi:10.1016/j.robot.2019.01.003

111. Okamoto, K., Itti, L., and Tsiotras, P., "Vision-Based Autonomous Path Following Using a Human Driver Control Model with Reliable Input-Feature Value Estimation," *IEEE Transactions on Intelligent Vehicles*, Vol. 4, No. 3, pp. 497–506, 2019, doi: 10.1109/TIV.2019.2919476

112. Okamoto, K. and Tsiotras, P., "Optimal Stochastic Vehicle Path Planning Using Covariance Steering," *IEEE Robotics and Automation Letters*, Vol. 4, No. 3, pp. 2276–2281, 2019, doi: 10.1109/LRA.2019.2901546

113. Okamoto, K., and Tsiotras, P., "Data-Driven Human Driver Lateral Control Models for Developing Haptic-Shared Control Advanced Driver Assist Systems," *Robotics and Autonomous Systems*, doi: 10.1016/j.robot.2019.01.020

114. Sun, W., Tsiotras, P., and Yezzi, A., "Multiplayer Pursuit Evasion Games in 3-Dimensional Flow Fields," *Dynamic Games and Applications*, Vol. 9, No. 4, pp. 1188-–1207, 2019, doi: 10.1007/s13235-019-00304-4

115. Tsiotras, P., and Valverde, A., "Dual Quaternions as a Tool for Modeling, Control, and Estimation for Spacecraft Robotic Servicing Missions," *Journal of the Astronautical Sciences*, Special Issued dedicated to John Junkins, (accepted May 2019). doi: 10.1007/s40295-019-00181-4

116. You, C., Lu, J., Filev, D., and Tsiotras, P., "Autonomous Planning and Control for Intelligent Vehicles in Traffic," *IEEE Transactions on Intelligent Transportation Systems*, Vol. 21, No. 6, pp. 2339–2349, June 2020, doi: 10.1109/TITS.2019.2918071

117. Makkapati, V, R., and Tsiotras, P., "Optimal Evading Strategies and Task Allocation in Multi-Player Pursuit-Evasion Problems," *Dynamic Games and Applications*, Vol. 9, No. 4, pp. 1168–1187, 2019, doi: 10.1007/s13235-019-00319-x

118. You, C., and Tsiotras, P., "Off-Road High-Speed Cornering for Autonomous Rally Racing," *IEEE Transactions on Control Systems Technology*, (accepted September 2019). doi: 10.1109/TCST.2019.2950354

119. Larsson, D., Maity, D., and Tsiotras, P., "Q-Search Trees: An Information-Theoretic Approach Towards Hierarchical Abstractions for Agents with Computational Limitations," *IEEE Transactions on Robotics*, (accepted May 2020). doi: 10.1109/TRO.2020.3003219

120. Makkapati, V. R., Sarabu, H., Comandur, V., Tsiotras, P., and Hutchinson, S., "Safe Optimal Control under Parametric Uncertainties," *IEEE Robotics and Automation Letters*, Vol. 5, No. 4, pp. 5725–5731, 2019. doi: 10.1109/LRA.2020.3010491

Journal Publications Under Review

121. Maity, D., and Tsiotras, P., "Optimal Controller Synthesis and Dynamic Quantizer Switching for Linear-Quadratic-Gaussian Systems," *IEEE Transactions on Automatic Control*, (submitted April 2019). (revision requested September 2019).

122. Guan, Y., Maity, D., Kroninger, C., and Tsiotras, P., "Bounded-Rational Pursuit-Evasion Games," *AIAA Journal of Guidance, Control, and Dynamics*, (submitted February 2020).

123. Ridderhof, J., and Tsiotras, P., "Closed-Loop Guidance for Minimum-Fuel Powered Descent," *AIAA Journal of Guidance, Control, and Dynamics*, (submitted May 2020).

124. Choi, K., Jitosho, R., Monterrosa, N., Sasi, A., Tsiotras, P., and Mazumdar, A., "Tunable Bistable Structures for High Force Density Reflexive Grasping," *ASME Dynamic Systems Letters*, (submitted August 2020).

### C. Conference Proceedings

1. Tsiotras, P., and Kelley, H. J., "The Goddard Problem with Constrained Time-of-Flight," *Proceedings, American Control Conference*, Atlanta, Georgia, June 15-17, 1988, pp. 1412-1421.

2. Tsiotras, P., and Kelley, H. J., "Drag-Law Effects in the Goddard Problem," *IFAC Optimization Workshop*, Tbilisi, USSR, June 21-25, 1988.

3. Tsiotras, P., and Longuski, J. M., "Analytic Solutions for the Attitude Motion of Spinning Rigid Bodies Subject to Periodic Torques," AAS Paper 91-404, AAS/AIAA Astrodynamics Conference, Durango, Colorado, August 19-22, 1991; also in *Advances in the Astronautical Sciences*, Vol. 76, pp. 661-678.

4. Longuski, J. M., and Tsiotras, P., "Attitude Motion of a Rigid Body Subject to Polynomial Torques," AAS Paper 91-405, AAS/AIAA Astrodynamics Conference, Durango, Colorado, August 19-22, 1991; also in *Advances in the Astronautical Sciences*, Vol. 76, pp. 679-690.

5. Tsiotras, P. and Longuski, J. M., "A Complex Analytic Solution for the Attitude Motion of a Near-Symmetric Rigid Body Under Body-Fixed Torques," IAF Paper 91-359, 42nd Congress, International Astronautical Federation, Montreal Canada, October 5-11, 1991.

6. Tsiotras, P., and Longuski, J. M., "On the Large Angle Problem in Rigid Body Attitude Dynamics," IAF Paper 92-0034, 43rd Congress, International Astronautical Federation, Washington, D.C., August 28-September 6, 1992.

7. Tsiotras, P., and Longuski, J. M., "On Attitude Stabilization of Symmetric Spacecraft with Two Control Torques," *Proceedings, American Control Conference*, San Francisco, California, June 2-4, 1993, pp. 46-50.

8. Tsiotras, P., Corless M., and Longuski, J. M., "Invariant Manifold Techniques for Attitude Control of a Symmetric Spacecraft," *Proceedings, 32nd IEEE Conference on Decision and Control*, San Antonio, Texas, December 15-17, 1993 pp. 1470-1475.

9. Tsiotras, P., and Longuski, J.M., "Analytic Solution of Euler's Equations of Motion for an Asymmetric Rigid Body," AAS Paper 93-580, AAS/AIAA Astrodynamics Conference, Victoria, B.C., Canada, August 16-19, 1993.

10. Longuski, J.M., Puig-Suari, J., Tsiotras, P., and Tragesser, S., "Optimal Mass for Aerobraking Tethers," 44th Congress, International Astronautical Federation, Graz, Austria, Oct. 16-22, 1993.

11. Wan, C.J., Tsiotras, P., Bernstein, D.S., and Coppola, V.T., "Global Asymptotic Stabilization of a Spinning Top with Torque Actuators using Stereographic Projection," *Proceedings, American Control Conference*, Baltimore, Maryland, June 29-July 1, 1994, pp. 536-540.

12. Tsiotras, P., "New Control Laws for the Attitude Stabilization of Rigid Bodies," *13th IFAC Symposium on Automatic Control in Aerospace*, Palo Alto, California, September 12-16, 1994, pp. 316-321.

13. Junkins, J.L., Schaub, H., and Tsiotras, P. "Orthogonal Projections Revisited: Concepts from Classical Mechanics and Modern Dynamical Systems Analysis," *31st Annual Meeting, Society of Engineering Science*, Texas A&M University, College Station, Texas, October 10-12, 1994.

14. Tsiotras, P., Corless, M., and Rotea, M., "An $\mathcal{L}_2$ Disturbance Attenuation Approach to the Nonlinear Benchmark Problem," *Proceedings, American Control Conference*, Seattle, Washington, June 21-23, 1995, pp. 4352-4356.

15. Tsiotras, P., "A Passivity Approach to Attitude Stabilization Using Nonredundant Sets of Kinematic Parameters," *Proceedings, 34th IEEE Conference on Decision and Control*, New Orleans, Louisiana, December 13-15, 1995, pp. 515-520.

16. Rotea, M., Tsiotras, P., and Corless, M., "Suboptimal Control of Rigid Body Motion with a Quadratic Cost," *3rd IFAC Symposium on Nonlinear Control Systems Design*, Tahoe City, California, June 26-28, 1995.

17. Tsiotras, P., and Luo, J., "Reduced Effort Control Laws for Underactuated Rigid Bodies," *Proceedings, 35th IEEE Conference on Decision and Control*, Kobe, Japan, December 11-13, 1996, pp. 495-496.

18. Tsiotras, P., Corless, M., and Rotea, M., "Optimal Control of Rigid Body Angular Velocity with Quadratic Cost," *Proceedings, 35th IEEE Conference on Decision and Control*, Kobe, Japan, December 11-13, 1996, pp. 1630-1635.

19. Tsiotras, P., "On the Optimal Regulation of an Axi-Symmetric Rigid Body with two Controls," *AIAA Guidance, Navigation, and Control Conference*, AIAA Paper 96-3791, San Diego, California, on July 29-31, 1996.

20. Tsiotras, P., "On the Choice of Coordinates for Control Problems on SO(3)," *30th Annual Conference on Information Sciences and Systems*, Princeton University, March 20-22, 1996, pp. 1238–1243 (invited).

21. Tsiotras, P., Junkins, J. L., and Schaub, H., "Higher Order Cayley-Transforms with Applications to the Attitude Problem," *AIAA/AAS Astrodynamics Specialist Conference*, AAS Paper 96-3628, San Diego, California, July 29-31, 1996, pp. 523–534.

22. Tsiotras, P., and Longuski, J. M., "Comments on a New Parameterization of the Attitude Kinematics," *AIAA/AAS Astrodynamics Specialist Conference*, AAS Paper 96-3627, San Diego, California, July 29-31, 1996, pp. 514–522.

23. Tsiotras, P., and Mason, S., "Self-Scheduled $\mathcal{H}_\infty$ Controllers for Magnetic Bearings," Nonlinear Dynamics and Controls Symposium, Eds. A.K. Bajaj, N.S. Namachchivya, and M.A. Franchek, *International Mechanical Engineering Congress and Exposition*, (*ASME Winter Meeting*), Atlanta, GA, November 17-22, 1996, pp. 151–158.

24. Krstić, M., and Tsiotras, P., "Inverse Optimality Results for the Attitude Motion of a Rigid Spacecraft," *Proceedings, American Control Conference*, Albuquerque, New Mexico, June 4-6, 1997, pp. 1884–1888.

25. Luo, J., and Tsiotras, P., "Exponentially Convergent Controllers for $n$-Dimensional Nonholonomic Systems in Power Form," *Proceedings, American Control Conference*, Albuquerque, New Mexico, June 4-6, 1997, pp. 398-402 **(best student paper finalist)**.

26. Tsiotras, P., and Luo, J., "A Low Authority Control Law for Underactuated Rigid Spacecraft," *Proceedings, 35th Aerospace Sciences Meeting*, Nonlinear Dynamical Systems Symposium, AIAA Paper 97-0113, Reno, Nevada, January 6-10, 1997, pp. 57–66 (invited).

27. Tsiotras, P., "Invariant Manifold Techniques for Control of Underactuated Mechanical Systems," Workshop on *Modelling and Control of Mechanical Systems*, Imperial College, London, United Kingdom, June 17-20, 1997, pp. 277–292 (invited).

28. Tsiotras, P. and Knospe, C., "Reducing Conservatism for Gain-Scheduled $\mathcal{H}_\infty$ Controllers for AMB's," *Proceedings, MAG '97 Industrial Conference and Exhibition on Magnetic Bearings*, Alexandria, Virginia, August 19–22, 1997, pp. 290–299.

29. Luo, J., and Tsiotras, P., "Control Design for Systems in Chained Form with Bounded Inputs," *Proceedings, American Control Conference*, Philadelphia, Pennsylvania, June 24-26, 1998, pp. 473–477, **(best student paper finalist)**.

30. Tsiotras, P., and Luo, J., "Stabilization and Tracking of Underactuated Axisymmetric Spacecraft with Bounded Control," *Proceedings, 4th IFAC Nonlinear Control Systems Design Symposium (NOLCOS '98)*, Twente, Netherlands, July 1–3, 1998, pp. 151–156 (invited).

31. Shen, H., and Tsiotras, P., "Time-Optimal Control of Axi-symmetric Spacecraft," *AIAA Guidance, Navigation and Control Conference*, AIAA Paper 98-4328, Boston, Massachusetts, August 10–12, 1998, pp. 1259–1272.

32. Hall C., and Tsiotras, P., and Shen, H., "Tracking Rigid Body Motion Using Thrusters and Reaction Wheels," *AIAA/AAS Astrodynamics Specialists Conference*, AIAA Paper 98-4471, Boston, Massachusetts, August 10–12, 1998, pp. 302–307.

33. Tsiotras, P., "Asymptotic Properties of Higher Order Cayley Transforms," *AIAA/AAS Astrodynamics Specialists Conference*, AIAA Paper 98-4387, Boston, Massachusetts, August 10–12, 1998, pp. 208–212.

34. Mason, S., Tsiotras, P. and Allaire, P., "Linear Parameter Varying Controllers for Flexible Rotors Supported on Magnetic Bearings," *6th International Symposium on Magnetic Bearings*, Cambridge, Massachusetts, August 5–7, 1998.

35. Zhang, J., Knospe, C. R., and Tsiotras, P., "A Unified Approach to Time-Delay System Stability via Scaled Small Gain," *Proceedings, American Control Conference*, San Diego, California, June 2-4, 1999, pp. 307–308, doi:10.1109/ACC.1999.782789

36. Canudas de Wit, C., and Tsiotras, P., "Dynamic Tire Friction Models for Vehicle Traction Control," *Proceedings, 38th IEEE Conference on Decision and Control*, Phoenix, Arizona, December 7-11, 1999, pp. 3746–3751, doi:10.1109/CDC.1999.827937

37. Zhang, J., Knospe, C., and Tsiotras, P., "Toward Less Conservative Stability Analysis of Time-Delay Systems," *Proceedings, 38th IEEE Conference on Decision and Control*, Phoenix, Arizona, December 7-11, 1999, pp. 2017–2022, doi:10.1109/CDC.1999.830935

38. Tsiotras, P., "Feasible Trajectory Generation for Underactuated Spacecraft Using Differential Flatness," *AAS/AIAA Astrodynamics Conference*, AAS Paper 99-323, Girdwood, Alaska, August 16–18, 1999; also *Advances in the Astronautical Sciences*, Vol. 103, pp. 361–377.

39. Tsiotras, P., Shen, H. and Hall, C., "Satellite Attitude Control and Power Tracking with Momentum Wheels," *AAS/AIAA Astrodynamics Conference*, AAS Paper 99-317, Girdwood, Alaska, August 16–18, 1999; also *Advances in the Astronautical Sciences*, Vol. 103, pp. 275–296.

40. Tsiotras, P. and Canudas de Wit, C., "On the Optimal Braking of Wheeled Vehicles," *Proceedings, American Control Conference*, Chicago, Illinois, June 28-30, 2000, pp. 569–573, doi:10.1109/ACC.2000.878964

41. Zhang, J., Knospe, C., and Tsiotras, P., "Stability of Linear Time-Delay Systems: A Delay-Dependent Criterion with a Tight Conservatism Bound," *Proceedings, American Control Conference*, Chicago, Illinois, June 28-30, 2000, pp. 1458–1462, doi:10.1109/ACC.2000.876743

42. Kim, B., and Tsiotras, P., "Time-Invariant Stabilization of a Unicycle-Type Mobile Robot: Theory and Experiments,"*IEEE International Conference on Control Applications*, Ancorage, Alaska, September 25-27, 2000, pp. 443–448, doi:10.1109/CCA.2000.897464

43. Tsiotras, P. and Velenis, E., "Low-Bias Control of AMB's Subject to Saturation Constraints," *IEEE International Conference on Control Applications*, Ancorage, Alaska, September 25-27, 2000, pp. 138–143 (invited), doi:10.1109/CCA.2000.897413

44. Tsiotras, P., Wilson, B., and Bartlett, R. "Control of a Zero-Bias Magnetic Bearing Using Control Lyapunov Functions," *Proceedings, 39th IEEE Conference on Decision and Control*, Sydney, Australia, December 12-15, 2000, pp. 4048–4053, doi:0.1109/CDC.2000.912348

45. Zhang, X., Tsiotras, P. and Knospe, C.," Stability Criteria for LPV Time-Delayed Systems: Delay-Independent Case," *IFAC Workshop on Linear Time Delay Systems*, Ancona, Italy, September 11-13, 2000, pp. 111–116.

46. Zhang, J., Knospe, C. and Tsiotras, P., "Asymptotic Stability of Linear Systems with Multiple Time-Invariant State-Delays," *IFAC Workshop on Linear Time Delay Systems*, Ancona, Italy, September 11-13, 2000, pp. 123–128.

47. Kim, B., and Tsiotras, P., "Experimental Comparison of Control Laws for Mobile Robots," *Proceedings, 8th IEEE Mediterranean Conference on Control and Automation*, Patras, Greece, July 17-19, 2000.

48. Tsiotras, P. and Doumtchenko, V., "Control of Spacecraft Subject to Actuator Failures: State-of-the-Art and Open Problems," AAS Paper 00-264, *R. H. Battin Astrodynamics Symposium*, Texas A&M, College Station, Texas, March 20–21, 2000, pp. 325–351 (invited).

49. Tsiotras, P., and Schleicher, A. "Detumbling and Partial Attitude Stabilization of a Rigid Spacecraft under Actuator Failure," AIAA Paper 00-4044, *AIAA Guidance, Navigation and Control Conference*, Denver, Colorado, Aug. 14–17, 2000, doi:10.2514/6.2000-4044

50. Richie, D., Tsiotras, P. and Fausz, J., "Simultaneous Attitude Control and Energy Storage Using VSCMGs: Theory and Simulation," *Proceedings, American Control Conference*, Arlington, Virginia, June 25-27, 2001, pp. 3973–3979 (invited), doi:10.1109/ACC.2001.946291

51. Zhang, J., Knospe C., and Tsiotras, P., "$\mathcal{H}_\infty$ Performance and Robust Stability of Linear Time-Delayed Systems: A Padé Comparison System Approach," Proceedings, *3rd IFAC Workshop on Time Delay Systems*, Santa Fe, New Mexico, December 8–10, 2001.

52. Canudas de Wit, C., Tsiotras, P., Claeys, X. and Horowitz, R., "Friction Road/Tire Modeling, Estimation and Optimal Braking Control," *Proceedings of the Workshop on Automotive Control*, "Nonlinear and Adaptive Control Network (NACO2)", Lund, Sweden, May 18–19, 2001.

53. Yoon, H., and Tsiotras, P., "Spacecraft Attitude Control And Power Tracking with Single-Gimballed VSCMGs and Wheel Speed Equalization," AAS Paper 01-379, *AAS/AIAA Astrodynamics Conference*, Quebec City, Canada, July 30–August 2, 2001, pp. 1121–1138.

54. Kim, B., Velenis, E., Kriengsiri, P. and Tsiotras, P., "A Spacecraft Simulator for Research and Education," AAS Paper 01-367, *AAS/AIAA Astrodynamics Conference*, Quebec City, Canada, July 30–August 2, 2001, pp. 897–914.

55. Richie, D., Tsiotras, P. and Fausz, J., "Variable Speed Control Moment Gyroscope Workbench: A New Simulation Tool for Tomorrow's Spacecraft," *20th Digital Avionics Systems Conference*, Daytona Beach, Florida, October 14–18, 2001, pp. (8.A.3)1–12.

56. Velenis, E., Tsiotras, P. and C. Canudas de Wit "Extension of the LuGre Dynamic Tire Friction Model to 2D Motion," *Proceedings, 10th Mediterranean Conference on Control and Automation (MED2002)*, Lisbon, Portugal, July 9-12, 2002.

57. Zhang, X., Lanzon, A. and Tsiotras, P., "On Robust Stability of LTI Parameter Dependent Systems ," *Proceedings, 10th Mediterranean Conference on Control and Automation (MED2002)*, Lisbon, Portugal, July 9-12, 2002.

58. Lanzon, A. and Tsiotras, P., "Robust Control of Energy Momentum Wheels Supported on Active Magnetic Bearings using $\mathcal{H}_\infty$ Loop-Shaping and $\mu$-Synthesis," *Proceedings, 15th IFAC World Congress*, Barcelona, Spain, July 21-26, 2002.

59. Luo, J. and Tsiotras, P., "LFT Representations for Nonlinear Mechanical Systems," *Proceedings, 15th IFAC World Congress*, Barcelona, Spain, July 21-26, 2002.

60. Tsiotras, P. and Arcak, M., "Low-Bias Control of AMB Subject to Voltage Saturation: State-Feedback and Observer Designs," *Proceedings, 41st IEEE Conference on Decision and Control*, Las Vegas, Nevada, December 10-13, 2002, pp. 2474–2479, doi:10.1109/CDC.2002.1184207

61. Canudas-de-Wit, C., Tsiotras, P. and Velenis, E., "Dynamic Friction Models for Longitudinal Road/Tire Interaction: Theoretical Advances," *21st IASTED Conference on Modelling, Identification and Control*, Innsbruck, Austria, February 18–21, 2002, pp. 48–53.

62. Canudas-de-Wit, C., Tsiotras, P., Velenis, E., Basset, M. and Gissinger, G. "Dynamic Friction Models for Longitudinal Road/Tire Interaction: Experimental Results," *21st IASTED Conference on Modelling, Identification and Control*, Innsbruck, Austria, February 18–21, 2002.

63. Shen, H. and Tsiotras, P. "Optimal Two-Impulse Rendezvous Between Two Circular Orbits Using Multiple Revolution Lambert's Solutions", AIAA Paper 02-4844 , *AIAA Guidance, Navigation, and Control Conference*, Monterey, California, August 5-8, 2002, doi:10.2514/6.2002-4844

64. Shen, H. and Tsiotras, P. "Optimal Sequencing for Servicing Satellites in Circular Constellations", AIAA Paper 02-4907, *AIAA/AAS Astrodynamics Specialists Conference*, Monterey, California, August 5-8, 2002, doi:10.2514/6.2002-4907

65. Park, C. and Tsiotras, P., "Suboptimal Feedback Control Using a Successive Wavelet-Galerkin Algorithm," *Proceedings, American Control Conference*, Denver, Colorado, June 4-6, 2003, pp. 1926–1931, doi:10.1109/ACC.2003.1243355

66. Park, C. and Tsiotras, P., "Approximations to Optimal Feedback Control Using a Successive Wavelet-Collocation Algorithm," *Proceedings, American Control Conference*, Denver, Colorado, June 4-6, 2003, pp. 1950–1955, doi:10.1109/ACC.2003.1243359

67. Zhang, X., Tsiotras, P. and Iwasaki, T., "Parameter-Dependent Lyapunov Functions for Exact Stability Analysis of Single-Parameter LTI Systems," *Proceedings, 42nd IEEE Conference on Decision and Control*, Maui, HI, December 9-12, 2003, pp. 5168–5173, doi:10.1109/CDC.2003.1272457

68. Shen, H. and Tsiotras, P., "Peer-to-Peer Refueling within a Satellite Constellation Part I: Zero-Cost Rendezvous Case," *Proceedings, 42nd IEEE Conference on Decision and Control*, Maui, HI, December 9-12, 2003, pp. 4345–4350, doi:10.1109/CDC.2003.1271834

69. Shen, H. and Tsiotras, P., "Peer-to-Peer Refueling within a Satellite Constellation Part II: Nonzero-Cost Rendezvous Case," *Proceedings, 42nd IEEE Conference on Decision and Control*, Maui, HI, December 9-12, 2003, pp. 4363–4368, doi:10.1109/CDC.2003.1271837

70. Marshall, A. and Tsiotras P., "Spacecraft Angular Velocity Stabilization Using A Single-Gimbal Variable Speed Control Moment Gyro," AIAA Paper 03-5654, *AIAA Guidance, Navigation and Control Conference*, Austin, TX, 2003, doi:10.2514/6.2003-5654

71. Jung, D. and Tsiotras, P., "A 3-DoF Experimental Test-Bed for Integrated Attitude Dynamics and Control Research," AIAA Paper 03-5331, *AIAA Guidance, Navigation and Control Conference*, Austin, TX, 2003, doi:10.2514/6.2003-5331

72. Shen, H. and Tsiotras, P., "Extension of Battin's Method for the Multiple-Revolution Lambert's Problem", *AAS/AIAA Astrodynamics Specialists Conference*, Big Sky, MO, August 3–7, 2003.

73. Tsiotras, P., Velenis, E. and Sorine, M., "A LuGre Tire Friction Model with Exact Aggregate Dynamics," *Proceedings, American Control Conference*, Boston, MA, June 30-July 2, 2004, pp. 1457–1462.

74. Tsiotras, P. and Bliman, P.-A., "An Exact Stability Analysis Test for One-Parameter Poly–nomially-Dependent Linear Systems," *43rd IEEE Conference on Decision and Control*, Paradise Island, Bahamas, Dec. 14–17, 2004, pp. 1337–1340, doi:10.1109/CDC.2004.1430228

75. Chaplais, F., Tsiotras, P. and Jung, D., "Redundant Wavelet Filter Banks on the Half-Axis with Applications to Signal Denoising with Small Delays," *43rd IEEE Conference on Decision and Control*, Paradise Island, Bahamas, Dec. 14–17, 2004, pp. 3102–3108, doi:10.1109/CDC.2004.1428943

76. Jain, S. and Tsiotras, P.,"A Solution of the Time-Optimal Hamilton-Jacobi-Bellman Equation using Wavelets," *43rd IEEE Conference on Decision and Control*, Paradise Island, Bahamas, Dec. 14–17, 2004, pp. 2728–2733, doi:10.1109/CDC.2004.1428874

77. Chaplais, F., Tsiotras, P., and Jung, D., "On-Line Wavelet Denoising with Application to the Control of a Reaction Wheel System," *AIAA Guidance, Navigation, and Control Conference*, AIAA Paper 04-5345, Providence, RI, August 16–19, 2004, doi:10.2514/6.2004-5345

78. Yoon, H. and Tsiotras, P., "Singularity Analysis and Avoidance for VSCMGs – Part I: No Power Constraint Case," *AIAA/AAS Astrodynamics Specialist Conference and Exhibit*, AIAA Paper 2004-5207, Providence, RI, August 16–19, 2004, doi:10.2514/6.2004-5207

79. Yoon, H. and Tsiotras, P., "Singularity Analysis and Avoidance for VSCMGs – Part II: Power Constraint Case," *AIAA/AAS Astrodynamics Specialist Conference and Exhibit*, AIAA Paper 2004-5208, Providence, RI, August 16–19, 2004, doi:10.2514/6.2004-5208

80. Jung, D. and Tsiotras, P., "An Experimental Comparison of CMG Steering Controls," *AIAA//AAS Astrodynamics Specialist Conference and Exhibit*, AIAA Paper 2004-5294, Providence, RI, August 16–19, 2004, doi:10.2514/6.2004-5294

81. Velenis, E. and Tsiotras, P., "Optimal Velocity Profile Generation for Given Acceleration Limits: Theoretical Analysis," *American Control Conference*, Portland, OR, June 8–10, 2005, pp. 1478–1483, doi:10.1109/ACC.2005.1470174

82. Velenis, E. and Tsiotras, P., "Optimal Velocity Profile Generation for Given Acceleration Limits: Receding Horizon Implementation," *American Control Conference*, Portland, OR, June 8–10, 2005, pp. 2147–2152, doi:10.1109/ACC.2005.1470288

83. Dienmusch, K. and Tsiotras, P. , "Use of Describing Functions for Predicting Low-Loss AMB Performance," *American Control Conference*, Portland, OR, June 8–10, 2005, pp. 3048–3053, doi:10.1109/ACC.2005.1470439

84. Iwasaki, T., Tsiotras, P., and Zhang, X., "State-Feedback Controller Synthesis for Parameter Dependent LTI Systems," *American Control Conference*, Portland, OR, June 8–10, 2005, pp. 593-597, doi:10.1109/ACC.2005.1470021

85. Jain, S. and Tsiotras, P., "The Method of Reflection for Solving the Time-Optimal Hamilton-Jacobi-Bellman Equation on the Interval using Wavelets," *13th IEEE Mediterranean Conference on Control and Automation*, Limassol, Cyprus, June 27–29, 2005, pp. 1062–1067, doi:10.1109/.2005.1467162

86. Zhang, X., Tsiotras, P. and Bliman, P.-A., "Multi-Parameter Dependent Lyapunov Functions for the Stability Analysis of LTI Parameter-Dependent Systems," *13th IEEE Mediterranean Conference on Control and Automation*, Limassol, Cyprus, June 27–29, 2005, pp. 1263–1268, doi:10.1109/.2005.1467197

87. Wilson, C. B., Tsiotras, P. and Heck-Ferri, B., "Control Designs for Low-Loss Active Magnetic Bearings," *IEEE/ASME International Conference on Advanced Intelligent Mechatronics*, Monterey, CA, July 24-28, 2005 (invited).

88. Wilson B. C., Tsiotras, P., and Heck-Ferri, B., "Implementation of the Generalized Complementary Flux Condition for Low-Loss Active Magnetic Bearings," *AIAA Guidance, Navigation, and Control Conference*, San Francisco, CA, August 15–18, 2005, AIAA Paper 05-5952 (invited), doi:10.2514/6.2005-5952

89. Wilson, B. C., Tsiotras, P., and Heck, B., "Experimental Validation of Control Designs for Low-Loss Active Magnetic Bearings," *AIAA Guidance, Navigation, and Control Conference*, San Francisco, CA, August 15–18, 2005, AIAA Paper 2005-5953 (invited), doi:10.2514/6.2005-5953

90. Yoon, H. and Tsiotras, P., "Adaptive Spacecraft Attitude Tracking Control with Actuator Uncertainties," *AIAA Guidance, Navigation, and Control Conference*, San Francisco, CA, August 15–18, 2005, AIAA Paper 2005-6392, doi:10.2514/6.2005-6392

91. Yoon, H. and Tsiotras, P., "Spacecraft Angular Velocity and Line-of-Sight Control Using A Single-Gimbal Variable-Speed Control Moment Gyro," *AIAA Guidance, Navigation, and Control Conference*, San Francisco, CA, August 15–18, 2005, AIAA Paper 2005-6393, doi:10.2514/6.2005-6393

92. Velenis, E., and Tsiotras, P., "Minimum Time vs. Maximum Exit Velocity Path Optimization During Cornering," *IEEE International Symposium on Industrial Electronics (ISIE05)*, Dubrovnik, Croatia, June 20-23, 2005, pp. 355–360 (invited), doi:10.1109/ISIE.2005.1528936

93. Velenis, E., and Tsiotras, P., "Optimal Velocity Profile Generation for Given Acceleration Limits: The Half-Car Model Case," *IEEE International Symposium on Industrial Electronics (ISIE05)*, Dubrovnik, Croatia, June 20-23, 2005, pp. 361–366 (invited), doi:10.1109/ISIE.2005.1528937

94. Dutta, A. and Tsiotras, P., "Asynchronous Optimal Mixed P2P Satellite Refueling Strategies," *Malcolm D. Shuster Astronautics Symposium*, Buffalo, NY, June 13–15, 2005, AAS Paper 2005-474, (invited).

95. Tsiotras, P., and de Nailly, A., "Comparison Between Peer-to-Peer and Single-Spacecraft Refueling Strategies for Spacecraft in Circular Orbits" *Infotech at Aerospace Conference*, Crystal City, DC, September 26–29, 2005, AIAA Paper 2005-7115, (invited).

96. Salazar A. and Tsiotras, P., "An Auction Algorithm for Optimal Satellite Refueling," *Georgia Tech Space Systems Engineering Conference*, Atlanta, GA, November 8–10, 2005, Paper No. GT-SSEC.F.5,(invited).

97. Jung, D., Zhou, D., Fink, R., Williams, T., Moshe, J. and Tsiotras, P., "Design and Development of a Low-Cost Test-Bed for Undergraduate Education in UAVs," *44th IEEE Conference on Decision and Control/European Control Conference ECC 2005*, Seville, Spain, Dec. 12-15, 2005, pp. 2739–2744, doi:10.1109/CDC.2005.1582577

98. Salazar A. and Tsiotras, P., "An Auction Algorithm for Allocating Fuel in a Satellite Constellation Using Peer-to-Peer Refueling," *American Control Conference*, Minneapolis, MN, June 14–16, 2006, pp. 4214–4219, (invited), doi:10.1109/ACC.2006.1657380

99. Dimarogonas, D., Tsiotras, P. and Kyriakopoulos, K., "Laplacian Cooperative Attitude Control of Multiple Rigid Bodies," *2006 CCA/CACSD/ISIC*, Münich, Germany, October 4-6, 2006, pp. 3064–3069, doi:10.1109/CACSD-CCA-ISIC.2006.4777127

100. Jung, D., and Tsiotras, P., "An Experimental Validation of Spacecraft Attitude and Power Tracking with Variable Speed Control Moment Gyroscopes," *AAS Spaceflight Mechanics Meeting*, Sedona, AZ, Jan. 28-Feb. 1, 2007, AAS Paper 07-130.

101. Dutta, A., and Tsiotras, P., "A Greedy Random Adaptive Search Procedure for Optimal Scheduling of P2P Satellite Refueling," *AAS Spaceflight Mechanics Meeting*, Sedona, AZ, Jan. 28-Feb. 1, 2007, AAS Paper 2007-150.

102. Dutta, A., and Tsiotras, P., "A Network Flow Formulation for an Egalitarian P2P Satellite Refueling Strategy," *AAS Spaceflight Mechanics Meeting*, Sedona, AZ, Jan. 28-Feb. 1, 2007, AAS Paper 2007-151.

103. Jung, D., and Tsiotras, P., "Inertial Attitude and Position Reference System Development for a Small UAV," *AIAA Infotech at Aerospace*, Rohnert Park, CA, May 7-10, 2007, AIAA Paper 2007-2763, doi:10.2514/6.2007-2763

104. Jung, D., and Tsiotras, P., "Modelling and Hardware-in-the-Loop Simulation for a Small Unmanned Aerial Vehicle," *AIAA Infotech at Aerospace*, Rohnert Park, CA, May 7-10, 2007, AIAA Paper 2007-2768, doi:10.2514/6.2007-2768

105. Velenis, E., Tsiotras, P., and Lu, J. "Aggressive Maneuvers on Loose Surfaces: Data Analysis and Input Parameterization," *15th IEEE Mediterranean Control Conference*, Athens, Greece, June 26-29, 2007, pp. 1–6, doi:10.1109/MED.2007.4433885.

106. Tsiotras, P., and Bakolas, E.,"A Hierarchical On-Line Path-Planning Scheme Using Wavelets," *European Control Conference*, Kos, Greece, July 2-5, 2007, pp. 2806–2812.

107. Velenis, E., Tsiotras, P., and Lu, J. "Modeling Aggressive Maneuvers on Loose Surfaces: The Cases of Trail-Braking and Pendulum-Turn," *European Control Conference*, Kos, Greece, July 2-5, 2007, pp. 1233–1240.

108. Tsiotras, P., "Multiresolution Hierarchical Path-Planning for Small UAVs," *European Control Conference*, Kos, Greece, July 2-5, 2007 (invited).

109. Jain, S. and Tsiotras, P., "Multiresolution-Based Direct Trajectory Optimization," *46th IEEE Conference on Decision and Control*, New Orleans, LA, Dec. 12-14, 2007, pp. 5991–5996, doi:10.1109/CDC.2007.4434076.

110. Jain, S. and Tsiotras, P., "Adaptive Multiresolution Mesh Refinement for the Solution of Evolution PDEs," *46th IEEE Conference on Decision and Control*, New Orleans, LA, Dec. 12-14, 2007, pp. 3525-3530, doi:10.1109/CDC.2007.4434075.

111. Cowlagi, R. and Tsiotras, P. "Beyond Quadtrees: Cell Decomposition for Path Planning using the Wavelet Transform," *46th IEEE Conference on Decision and Control*, New Orleans, LA, Dec. 12-14, 2007, pp. 1392–1397, doi:10.1109/CDC.2007.4434146.

112. Jung, D., and Tsiotras, P., "Bank-to-Turn Control for a Small UAV using Backstepping and Parameter Adaptation," *17th IFAC World Congress*, Seoul, South Korea, July 6-11, 2008, pp. 4406-4411.

113. Jung, D., and Tsiotras, P., "Multiresolution On-Line Path Planning for Small Unmanned Aerial Vehicles," *American Control Conference*, Seattle, WA, June 11-13, 2008, pp. 2744–2749, doi:10.1109/ACC.2008.4586908

114. Cowlagi, R., and Tsiotras, P., "Multiresolution Path Planning with Wavelets: A Local Replanning Approach," *American Control Conference*, Seattle, WA, June 11-13, 2008, pp. 1220–1225, doi:10.1109/ACC.2008.4586659

115. Dimarogonas, D. V., Tsiotras, P. and Kyriakopoulos, K. J., "Leader-Follower Cooperative Attitude Control of Multiple Rigid Bodies," *American Control Conference*, Seattle, WA, June 11-13, 2008, pp. 801–806, doi:10.1109/ACC.2008.4586591

116. Jain, S., Tsiotras, P., and Velenis, E., "Optimal Feedback Velocity Profile Generation for a Vehicle with Given Acceleration Limits: A Level Set Implementation," *16th IEEE Mediterranean Conference on Control and Automation*, Ajaccio, Corsica, France, June 25-26, 2008, pp. 451–456, doi:10.1109/MED.2008.4602226

117. Dutta, A., and Tsiotras. P., "Hohmann-Phasing Cooperative Rendezvous Maneuvers," *F. Landis Markley Astronautics Symposium*, Chesapeake Bay, June 28–July 2, 2008, Paper AAS 08-297.

118. Jung, D., Ratti, J., and Tsiotras, P., "Real-time Implementation and Validation of a New Hierarchical Path Planning Scheme for UAVs via Hardware-in-the-Loop Simulation," *International Symposium of Unmanned Aerial Vehicles (UAV'08)*, Orlando, FL, June 23-24, 2008.

119. Jung, D., and Tsiotras, P., "On-line Path Generation for Small Unmanned Aerial Vehicles using B-Spline Path Templates," *AIAA Guidance, Navigation, and Control Conference*, Honolulu, HI, Aug. 18-21, 2008, AIAA Paper 2008-7135.

120. Jain, S., and Tsiotras, P., "Sequential Multiresolution Trajectory Optimization for Moving Targets," *AIAA Guidance, Navigation, and Control Conference*, Honolulu, HI, Aug. 18-21, 2008, AIAA Paper 2008-6980.

121. Bakolas, E., and Tsiotras, P., "Multiresolution Path Planning Via Sector Decompositions Compatible to On-Board Sensor Data," *AIAA Guidance, Navigation, and Control Conference*, Honolulu, HI, Aug. 18-21, 2008, AIAA Paper 2008-7238.

122. Dutta, A., and Tsiotras, P., "A Cooperative P2P Refueling Strategy for Circular Satellite Constellations," *AIAA Space Conference and Exhibit*, San Diego, Sept. 9-11, 2008, AIAA Paper 2008-7643.

123. Bakolas, E. and Tsiotras, P., "On-Line, Kinodynamic Trajectory Generation Through Rectangular Channels Using Path and Motion Primitives," *47th IEEE Conference on Decision and Control*, Cancun, Mexico, Dec. 9–11, 2008, pp. 3725–3730, doi: 10.1109/CDC.2008.4738712.

124. Chakrabortty, A., Arcak, M. and Tsiotras, P., "Robust Design of a Spacecraft Attitude Tracking Control System with Actuator Uncertainties," *47th IEEE Conference on Decision and Control*, Cancun, Mexico, Dec. 9–11, 2008, pp. 1587-1592, doi:10.1109/CDC.2008.4738803.

125. Velenis, E., Tsiotras, P. and Lu J., "Trail-Braking Driver Input Parameterization for General Corner Geometry," *Motorsports Engineering Conference*, Concord, NC, Dec. 2–4, 2008, SAE Paper 2008-01-2986.

126. Kim, B. and Tsiotras, P., "Image Segmentation on Cell-Center Sampled Quadtree and Octree Grids," *Wavelet Applications in Industrial Processing VI*, San Jose, CA, Jan. 18–22, 2009, IS&T/SPIE Paper 7248-22.

127. Dutta, A. and Tsiotras, P., "A Cooperative Egalitarian Peer-to-Peer Strategy for Refueling Satellites in Circular Constellations," *AAS/AIAA Space Flight Mechanics Meeting*, Savannah, GA, Feb. 8-12, 2009, AAS Paper 2009-109.

128. Zhao, Y. and Tsiotras, P., "A Density-Function Based Mesh Refinement Algorithm for Solving Optimal Control Problems," *Infotech@Aerospace Conference*, Seattle, WA, April 6–9, 2009, AIAA Paper 2009-2019 (invited).

129. Cho, D.-M., Jung, D. and Tsiotras, P., "A 5-dof Experimental Platform for Spacecraft Rendezvous and Docking," *Infotech@Aerospace Conference*, Seattle, WA, April 6–9, 2009, AIAA Paper 2009-1869.

130. Cowlagi, R. and Tsiotras, P., "Shortest Distance Problems in Graphs Using History-Dependent Transition Costs with Application to Kinodynamic Path Planning," *American Control Conference*, St. Louis, MO, June 10–12, 2009, **(best student paper award)**, pp. 414–419, doi: 10.1109/ACC.2010.5530768

131. Bakolas, E. and Tsiotras, P., "On the Generation of Nearly Optimal, Planar Paths of Bounded Curvature and Curvature Gradient," *American Control Conference*, St. Louis, MO, June 10–12, 2009, pp. 385-390, doi:10.1109/ACC.2009.5160269.

132. Scacchioli, A., Tsiotras, P., and Lu, J., "Nonlinear-Feedback Vehicle Traction Force Control with Load Transfer for Accident Avoidance," *ASME Dynamic Systems and Control Conference (DSCC'09)*, Hollywood, CA, Oct. 12–14, 2009.

133. Watts, R., Tsiotras, P. and Johnson, E., "Pilot Feedback for an Automated Planning Aid System in the Cockpit," *28th Digital Avionics Systems Conference*, Orlando, FL, Oct. 25–29, 2009.

134. Bakolas, E., and Tsiotras, P., "The Asymmetric Sinistral/Dextral Markov-Dubins Problem," *48th IEEE Conference on Decision and Control*, Shanghai, China, Dec. 16–18, 2009, pp. 5649–5654, doi:10.1109/CDC.2009.5399851.

135. Velenis, E., Frazzoli, E. and Tsiotras, P., "On Steady-State Cornering Equilibria for Wheeled Vehicles with Drift," *48th IEEE Conference on Decision and Control*, Shanghai, China, Dec. 16–18, 2009, pp. 3545–3550, doi:10.1109/CDC.2009.5399782.

136. Zhao, Y. and Tsiotras, P., "Time-Optimal Parameterization of Geometric Path for Fixed-Wing Aircraft," *Infotech@Aerospace Conference*, Atlanta, GA, April 20-22, 2010, AIAA Paper 2010-3352.

137. Bakolas, E. and Tsiotras, P., "Minimum-Time Paths for a Light Aircraft in the Presence of Regionally-Varying Strong Winds," *Infotech@Aerospace Conference*, Atlanta, GA, April 20–22, 2010, AIAA Paper 2010-3380.

138. Bakolas, E. and Tsiotras, P., "Time-Optimal Synthesis for the Zermelo-Markov-Dubins Problem: the Constant Wind Case," *American Control Conference*, Baltimore, MD, June 30–July 2, 2010, pp. 6163–6168, doi:10.1109/ACC.2010.5531602

139. Bakolas, E. and Tsiotras, P., "The Zermelo-Voronoi Diagram: a Dynamic Partition Problem," *American Control Conference*, Baltimore, MD, June 30–July 2, 2010, pp. 1320–1325, doi:10.1109/ACC.2010.5531154

140. Cowlagi, R. and Tsiotras, P., "On the Existence and Synthesis of Curvature-Bounded Paths Inside Nonuniform Rectangular Channels," *American Control Conference*, Baltimore, MD, June 30–July 2, 2010, pp. 5382–5387, doi:10.1109/ACC.2010.5530772

141. Cowlagi, R. and Tsiotras, P., "Kinematic Feasibility Guarantees in Geometric Path Planning using History-based Transition Costs over Cell Decompositions," *American Control Conference*, Baltimore, MD, June 30–July 2, 2010, pp. 5388–5393, doi:10.1109/ACC.2010.5530768

142. Velenis, E., Katzourakis, D., Frazolli, E., Tsiotras, P. and Happee, R., "Stabilization of Steady-State Drifting for a RWD Vehicle," *10th International Symposium on Advanced Vehicle Control (AVEC)*, Loughborough, UK, August 22–26, 2010.

143. Steinfeldt, B, and Tsiotras, P., "A State-Dependent Riccati Equation Approach to Atmospheric Entry Guidance," *AIAA Guidance, Navigation, and Control Conference*, Toronto, Canada, Aug. 2–4, 2010, AIAA Paper 2010-8310.

144. Lu, Y., Huo, Y., and Tsiotras, P., "Beamlet-like Data Processing for Accelerated Path-Planning Using Multiscale Information of the Environment," *49th IEEE Conference on Decision and Control*, Atlanta, GA, Dec. 15–17, 2010, pp. 3808–3813, doi:10.1109/CDC.2010.5717586.

145. Cowlagi, R., and Tsiotras, P., "Multi-resolution Path Planning: Theoretical Analysis, Efficient Implementation, and Extensions to Dynamic Environments," *49th IEEE Conference on Decision and Control*, Atlanta, GA, Dec. 15–17, 2010, pp. 1384–1390, doi:10.1109/CDC.2010.5717915.

146. Bakolas, E. and Tsiotras, P., "Optimal Pursuit of Moving Targets using Dynamic Voronoi Diagrams," *49th IEEE Conference on Decision and Control*, Atlanta, GA, Dec. 15–17, 2010, pp. 7431–7436, doi:10.1109/CDC.2010.5717963.

147. Tsiotras, P. and Reyes Castro L. I., "A Note on the Consensus Protocol with Some Applications to Agent Orbit Pattern Generation," *10th Symposium on Distributed Autonomous Robotic Systems (DARS)*, Lausanne, Switzerland, November 1–3, 2010.

148. Bakolas, E. and Tsiotras, P., "Optimal Pursuer and Moving Target Assignment using Dynamic Voronoi Diagrams," *American Control Conference*, San Francisco, CA, June 29–July 1, 2011, pp. 5444–5449, doi:10.1109/ACC.2011.5991364

149. Zhao, Y. and Tsiotras, P., "A Quadratic Programming Approach to Path Smoothing," *American Control Conference*, San Francisco, CA, June 29–July 1, 2011, pp. 5324–5329, doi:10.1109/ACC.2011.5990880

150. Tsiotras, P. and Reyes Castro L. I., "Extended Multi-agent Consensus Protocols for the Generation of Geometric Patterns in the Plane," *American Control Conference*, San Francisco, CA, June 29–July 1, 2011, pp. 3850–3855, doi:10.1109/ACC.2011.5990927

151. Bakolas, E., Zhao, Y. and Tsiotras, P., "Initial Guess Generation for Aircraft Landing Trajectory Optimization," *AIAA Guidance, Navigation, and Control Conference*, Portland, OR, Aug. 8-11, 2011, AIAA Paper 2011-6689, doi:10.2514/6.2011-6689

152. Cowlagi, R. and Tsiotras, P., "Multiresolution $H$-Cost Motion Planning: A New Framework for Hierarchical Motion Planning for Autonomous Mobile Vehicles," *IEEE/RSJ International Conference on Intelligent Robots and Systems*, San Francisco, CA, Sept. 25-30, 2011, pp. 3501–3506, doi:10.1109/IROS.2011.6048243.

153. Lu, Y., Huo, X., Arslan, O. and Tsiotras, P., "Multi-Scale LPA* with Low Worst-Case Complexity Guarantees," *IEEE/RSJ International Conference on Intelligent Robots and Systems*, San Francisco, CA, Sept. 25-30, 2011, pp. 3507–3512, doi:10.1109/IROS.2011.6048262.

154. Arslan, O., Tsiotras, P., and Huo, X., "Solving Shortest Path Problems with Curvature Constraints Using Beamlets," *IEEE/RSJ International Conference on Intelligent Robots and Systems*, San Francisco, CA, Sept. 25-30, 2011, pp. 3533–3538, doi:10.1109/IROS.2011.6048546.

155. Bakolas, E. and Tsiotras. P., "On the Relay Pursuit of a Maneuvering Target," *50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, FL, Dec. 12–15, 2011, pp. 4270–4275, doi:10.1109/CDC.2011.6160323.

156. Chakraborty, I., Tsiotras, P. and Lu, J., "Mitigation of Unavoidable T-bone Collisions at Intersections Through Aggressive Maneuvering," *50th IEEE Conference on Decision and Control and European Control Conference*, Orlando, FL, Dec. 12–15, 2011, pp. 3264–3269, doi:10.1109/CDC.2011.6161241.

157. Cowlagi, R. and Tsiotras, P., "Hierarchical Motion Planning with Kinodynamic Feasibility Guarantees: Local Trajectory Planning via Model Predictive Control," *IEEE International Conference on Robotics and Automation*, St. Paul, MN, May 14–18, 2012, pp. 4003–4008, doi:10.1109/ICRA.2012.6224895.

158. Anderson, R., Bakolas, E., Milutinović, D. and Tsiotras, P., "The Markov-Dubins Problem in the Presence of a Stochastic Drift Field," *51th IEEE Conference on Decision and Control Conference*, Maui, HI, Dec. 10–13, 2012, pp. 130–135, doi:10.1109/CDC.2012.6426674

159. Delahaye, D., Puechmorel, S., Feron, E., and Tsiotras, P., "Mathematic Models for Aircraft Trajectory Design : A Survey," *The 3rd ENRI International Workshop on ATM/CNS*, Tokyo, Japan, Feb. 19–22, 2013.

160. Arslan, O. and Tsiotras, P., "Use of Relaxation Methods in Sampling-Based Algorithms for Optimal Motion Planning," *IEEE International Conference on Robotics and Automation*, Karlsrühe, Germany, May 6–10, 2013, pp. 2413–2420, doi:10.1109/ICRA.2013.6630906

161. Jeon, J.-H., Cowlagi, R., Peters, S., Karaman, S., Frazzoli, E., Tsiotras, P., and Iagnemma, K., "Optimal Motion Planning with the Half-Car Dynamical Model for Autonomous High-Speed Driving," *American Control Conference*, Washington, DC, June 17–19, 2013, pp. 188–193, doi:10.1109/ACC.2013.6579835

162. Filipe, N., and Tsiotras, P., "Simultaneous Position and Attitude Control Without Linear and Angular Velocity Feedback Using Dual Quaternions," *American Control Conference*, Washington, DC, June 17–19, 2013, pp. 4815–4820, doi:10.1109/ACC.2013.6580582

163. Zhao, Y., and Tsiotras, P., "Speed Profile Optimization for Optimal Path Tracking" *American Control Conference*, Washington, DC, June 17–19, 2013, pp. 1173–1178, doi:10.1109/ACC.2013.6579994

164. Chakraborty, I., Sanz-Diaz, R., and Tsiotras, P. "Time-Optimal Vehicle Posture Control to Mitigate Unavoidable Collisions Using Conventional Control Inputs," *American Control Conference*, Washington, DC, June 17–19, 2013, pp. 2165–2170, doi:10.1109/ACC.2013.6580156

165. Filipe, N., and Tsiotras, P., "Rigid Body Motion Tracking Without Linear and Angular Velocity Feedback Using Dual Quaternions," *12th European Control Conference*, Zürich, Switzerland, July 17–19, 2013, pp. 329–334.

166. Filipe, N., and Tsiotras, P., "Adaptive Model-Independent Tracking of Rigid Body Position and Attitude Motion with Mass and Inertia Matrix Identification using Dual Quaternions," *AIAA Guidance, Navigation, and Control Conference*, Boston, MA, August 19–22, 2013 (**best student paper award**), AIAA Paper 2013-5173, doi:10.2514/6.2013-5173

167. Cho, D.-M., Tsiotras, P., Zhang, G., and Holzinger, M., "Robust Feature Detection, Acquisition and Tracking for Relative Navigation in Space with a Known Target," *AIAA Guidance, Navigation, and Control Conference*, Boston, MA, August 19–22, 2013, AIAA Paper 2013-5197, doi:10.2514/6.2013-5197

168. Zhao, Y., and Tsiotras, P., "Fuel-Efficient Flight Optimization for ATC Operations During Descent and Approach Phases," *AIAA Guidance, Navigation, and Control Conference*, Boston, MA, August 19–22, 2013, AIAA Paper 2013-4539, doi:10.2514/6.2013-4539

169. Filipe, N., and Tsiotras, P., "Adaptive Position and Attitude Tracking Controller for Satellite Proximity Operations using Dual Quaternions," *Astrodynamics Specialist Conference*, Hilton Head, SC, August 11–15, 2013, AAS Paper 13-858; also in *Advances in the Astronautical Sciences*, Vol. 150, pp. 2313–2332.

170. Sun, W., and Tsiotras, P., "A Sequential Pursuer-Target Assignment Problem Under External Disturbances," *52nd IEEE Conference on Decision and Control Conference*, Florence, Italy, Dec. 10–13, 2013, pp. 3994–3999, doi:10.1109/CDC.2013.6760500

171. Tsiotras, P., "ASTROS: A 5DOF Experimental Facility For Research in Space Proximity Operations," *37th AAS Guidance and Control Conference*, Breckenridge, CO, Jan. 31–Feb. 5, 2014, AAS Paper 2014-104.

172. Zafeiropoulos, S., and Tsiotras, P., "Design and Evaluation of a Lane-Tracking Driver Steering Assist System with a Two-Point Visual Driver Model," *American Control Conference*, Portland, OR, June 4–6, 2014, pp. 3911–3917, doi:10.1109/ACC.2014.6858867

173. Zhang, G., Vela, P., Tsiotras, P., and Cho, D.-M., "Efficient Closed-Loop Detection and Pose Estimation for Vision-Only Relative Localization in Space with a Cooperative Target," *AIAA Space and Astronautics Forum and Exposition*, San Diego, CA, August 4–7, 2014, AIAA Paper 2014-4262, doi:10.2514/6.2014-4262

174. Filipe, N., Holzinger, M. J., and Tsiotras, P., "Pose-Tracking Controller for Satellites with Time-Varying Inertia," *AIAA Space and Astronautics Forum and Exposition*, San Diego, CA, August 4–7, 2014, AIAA Paper 2014-4455, doi:10.2514/6.2014-4455

175. Exarchos, I., and Tsiotras, P., "An Asymmetric Version of the Two Car Pursuit-Evasion Game," *53rd IEEE Conference on Decision and Control*, Los Angeles, CA, Dec. 15–17, 2014, pp. 4272–4277, doi:10.1109/CDC.2014.7040055

176. Sun, W. and Tsiotras, P., "An Optimal Evader Strategy in a Two-Pursuer One-Evader Problem," *53rd IEEE Conference on Decision and Control*, Los Angeles, CA, Dec. 15–17, 2014, pp. 4266-4271, doi:10.1109/CDC.2014.7040054

177. van de Hoef, A., Dimarogonas, D. V., and Tsiotras, P., "Spectral Analysis of Extended Consensus Algorithms for Multiagent Systems," *53rd IEEE Conference on Decision and Control*, Los Angeles, CA, Dec. 15–17, 2014, pp. 2204-2209, doi:10.1109/CDC.2014.7039725

178. Arslan, O., Theodorou, E., and Tsiotras, P., "Information-Theoretic Stochastic Optimal Control via Incremental Sampling-based Algorithms," *IEEE Symposium on Adaptive Dynamic Programming and Reinforcement Learning*, Orlando, FL, Dec. 9–12, 2014, pp. 71–78, doi:10.1109/ADPRL.2014.7010617

179. Sun, W., Theodorou, E., and Tsiotras, P., "Continuous-Time Differential Dynamic Programming with Terminal Constraints," *IEEE Symposium on Adaptive Dynamic Programming and Reinforcement Learning*, Orlando, FL, Dec. 9–12, 2014, pp. 289–294, doi:10.1109/ADPRL.2014.7010647

180. Valverde, A., Filipe, N., Kontitsis, M. and Tsiotras, P., "Experimental Validation of an Inertia-Free Controller and a Multiplicative EKF for Pose Tracking and Estimation Based on Dual Quaternions," *38th AAS Guidance and Control Conference*, Breckenridge, CO, Jan. 30–Feb. 4, 2015, AAS Paper 2015-017.

181. Hauer, F., Kundu, A., Rehg, J., and Tsiotras, P., "Multi-scale Perception and Path Planning on Probabilistic Obstacle Maps," *IEEE International Conference on Robotics and Automation*, Seattle, WA, May 26–30, 2015, pp. 4210–4215, doi:10.1109/ICRA.2015.7139779

182. Arslan O., and Tsiotras, P., "Dynamic Programming Guided Exploration for Sampling-based Motion Planning Algorithms," *IEEE International Conference on Robotics and Automation*, Seattle, WA, May 26–30, 2015, pp. 4819–4826, doi:10.1109/ICRA.2015.7139869

183. Filipe, N., Kontitsis, M. and Tsiotras, P., "An Extended Kalman Filter for Spacecraft Pose Estimation Using Dual Quaternions," *American Control Conference*, Chicago, IL, July 1–3, 2015, pp. 3187–3192, doi: 10.1109/ACC.2015.7171823

184. Sun, W., and Tsiotras, P., "Pursuit Evasion Game of Two Players under an External Flow Field," *American Control Conference*, Chicago, IL, July 1–3, 2015, pp. 5617–5622, doi:10.1109/ACC.2015.7172219

185. Sun, W., Theodorou, E. and Tsiotras, P., "Game Theoretic Continuous Time Differential Dynamic Programming," *American Control Conference*, Chicago, IL, July 1–3, 2015, pp. 5593–5598, doi:10.1109/ACC.2015.7172215

186. Arslan, O., and Tsiotras, P., "Machine Learning Guided Exploration for Sampling-based Motion Planning Algorithms," *IEEE/RJS International Conference on Intelligent Robots and Systems*, Hamburg, Germany, September 28–October 3, 2015, pp. 2646–2652, doi: 10.1109/IROS.2015.7353738

187. Exarchos, I., Tsiotras, P., and Pachter, M., "UAV Collision Avoidance based on the Solution of the Suicidal Pedestrian Differential Game," *AIAA Guidance, Navigation, and Control Conference*, San Diego, CA, January 4–8, 2016.

188. Kontitsis, M., Tsiotras, P. and Theodorou, E., "An Information-Theoretic Active Localization Approach during Relative Circumnavigation in Orbit," *AIAA Guidance, Navigation, and Control Conference*, San Diego, CA, January 4–8, 2016.

189. Hauer, F., Tsiotras, P., "Reduced Complexity Multi-Scale Path-Planning on Probabilistic Maps," *IEEE International Conference on Robotics and Automation*, Stockholm, Sweden, May 16-21, 2016, pp. 83–88, doi: 10.1109/ICRA.2016.7487119

190. You, C., and Tsiotras, P., " Optimal Two-Point Visual Driver Model and Controller Development for Driver-Assist Systems for Semi-Autonomous Vehicles," *American Control Conference*, Boston, MA, July 6–8, 2016, pp. 5976–5981, doi: 10.1109/ACC.2016.7526607

191. Antonello, A., Carron, A., Carli, R., and Tsiotras, P., "Performance Analysis of Three Cost Policies for the Control of a Camera in Relative Circumnavigation Scenarios," *International Astronautical Congress*, Guadalajara, Mexico, Sept. 26–30, 2016.

192. Antonello, A., and Tsiotras, P., "Vision Based Attitude Determination Using a Simultaneous Localization and Mapping Algorithm During Relative Circumnavigation of Non-Cooperative Objects," *International Astronautical Congress*, Guadalajara, Mexico, Sept. 26–30, 2016.

193. You, C., Lu, J., and Tsiotras, P., "Driver Parameter Estimation Using Joint E-/UKF and Dual E-/UKF Under Nonlinear State Inequality Constraints," *IEEE Conference on Systems, Man and Cybernetics*, Budapest, Hungary, Oct. 9-12, 2016, pp. 1215–1220, doi: 10.1109/SMC.2016.7844407

194. Okamoto, K., and Tsiotras, P., "A New Hybrid Sensorimotor Driver Model with Model Predictive Control," *IEEE Conference on Systems, Man and Cybernetics*, Budapest, Hungary, Oct. 9-12, 2016, **(best student paper finalist)**, pp. 1866–1871, doi: 10.1109/SMC.2016.7844510

195. Brewer, M. J., and Tsiotras, P., "Partial Attitude Consensus for Underactuated Satellites Clusters," *55th IEEE Conference on Decision and Control*, Las Vegas, NV, Dec. 12–14, 2016, pp. 3524–3529, doi: 10.1109/CDC.2016.7798798

196. Exarchos, I., Theodorou, E., and Tsiotras, P.,"Game-Theoretic and Risk-Sensitive Stochastic Optimal Control via Forward and Backward Stochastic Differential Equations," *55th IEEE Conference on Decision and Control*, Las Vegas, NV, Dec. 12–14, 2016, pp. 6154–6160, doi: 10.1109/CDC.2016.7799215

197. Arslan, O., and Tsiotras, P., "Incremental Sampling-based Motion Planners using Policy Iteration Methods," *55th IEEE Conference on Decision and Control*, Las Vegas, NV, Dec. 12–14, 2016, pp. 5004–5009, doi: 10.1109/CDC.2016.7799034

198. Sun, W., Theodorou, E., and Tsiotras, P., "Stochastic Game Theoretic Trajectory Optimization in Continuous Time," *55th IEEE Conference on Decision and Control*, Las Vegas, NV, Dec. 12–14, 2016, pp. 6167–6172, doi: 10.1109/CDC.2016.7799217

199. Arslan, O., Berntorp, K., and Tsiotras, P.,"Sampling-based Algorithms for Optimal Motion Planning Using Closed-loop Prediction," *International Conference on Robotics and Automation*, Singapore, May 12–14, 2017, pp. 322–327, doi: 10.23919/ACC.2017.7962973

200. You, C., and Tsiotras, P., "Vehicle Modeling and Parameter Estimation Using Adaptive Limited Memory Joint-State UKF," *American Control Conference*, Seattle, WA, May 24–26, 2017, pp. 322–327, doi: 10.23919/ACC.2017.7962973

201. Sun, W., Tsiotras, P., Lolla, T., Subramani, D. N., and Lermusiaux, P. F. J., "Pursuit-Evasion Games in Dynamic Flow Fields via Reachability Set Analysis," *American Control Conference*, Seattle, WA, May 24–26, 2017, pp. 4595–4600, doi: 10.23919/ACC.2017.7963664.

202. Hauer, F., and Tsiotras, P., "Deformable Rapidly-Exploring Random Trees," *Robotics: Science and Systems*, Cambridge, MA, July 12–16, 2017.

203. Goldshtein, M., and Tsiotras, P., "Finite-Horizon Covariance Control of Linear Time-Varying Systems," *56th IEEE Conference on Decision and Control*, Melbourne, Australia, Dec. 12–15, 2017, pp. 3606–3611, doi: 10.1109/CDC.2017.8264189.

204. Larsson, D., Braun, D., and Tsiotras, P., "Hierarchical State Abstractions for Decision-Making Problems with Computational Constraints," *56th IEEE Conference on Decision and Control*, Melbourne, Australia, Dec. 12–15, 2017, pp. 1138–1143, doi: 10.1109/CDC.2017.8263809

205. Valverde, A., and Tsiotras, P., "Spacecraft Trajectory Tracking with Identification of Mass Properties Using Dual Quaternions," *AIAA Guidance, Navigation, and Control Conference*, Kissimmee, FL, Jan. 8–12, 2018. doi: 10.2514/6.2018-1576

206. Ridderhof, J., and Tsiotras, P., "Uncertainty Quantification and Control During Mars Powered Descent and Landing using Covariance Steering," *AIAA Guidance, Navigation, and Control Conference*, (AIAA 2018-1576), Kissimmee, FL, Jan. 8–12, 2018. doi: 10.2514/6.2018-0611

207. Makkapati, V. R., Sun, W., and Tsiotras, P., "Pursuit-Evasion Problems Involving Two Pursuers and One Evader," *AIAA Guidance, Navigation, and Control Conference*, Kissimmee, FL, Jan. 8–12, 2018. doi: 10.2514/6.2018-2107

208. Dor, M., and Tsiotras, P., "ORB-SLAM Applied to Spacecraft Non-Cooperative Rendezvous," *AAS Spaceflight Mechanics Conference*, Kissimmee, FL, Jan. 8–12, 2018, doi: 10.2514/6.2018-1963

209. Valverde, A., and Tsiotras, P., "Relative Pose Stabilization using Backstepping Control with Dual Quaternions," *AAS Spaceflight Mechanics Conference*, Kissimmee, FL, Jan. 8–12, 2018, doi: 10.2514/6.2018-1980

210. You, C., and Tsiotras, P., "Real-Time Trail-Braking Maneuver Generation for Off-Road Vehicle Racing," *American Control Conference*, Milwaukee, WI, June 27–29, 2018, pp. 4751–4756, doi: 10.23919/ACC.2018.8431620

211. Okamoto, K., and Tsiotras, P., "A Comparative Study of Data-Driven Human Driver Lateral Control Models," *American Control Conference*, Milwaukee, WI, June 27–29, 2018, pp. 3988–3993, doi: 10.23919/ACC.2018.8431446

212. Valverde, A., and Tsiotras, P., "Modeling of Spacecraft-Mounted Robot Dynamics and Control Using Dual Quaternions," *American Control Conference*, Milwaukee, WI, June 27–29, 2018, pp. 670–675, doi: 10.23919/ACC.2018.8431054

213. You, C., Lu, J., Filev, D., and Tsiotras, P., "Autonomous Vehicle Planning in Traffic Using Deep Inverse Reinforcement Learning," *The 29th IEEE Intelligent Vehicles Symposium*, Changshu, China, June 26–30, 2018.

214. Okamoto, K., Goldshtein, M., and Tsiotras, P., "Optimal Covariance Control for Stochastic Systems Under Chance Constraints," *57th IEEE Conference on Decision and Control*, Miami, FL, Dec. 17–19, 2018, pp. 266–271. doi: 10.1109/LCSYS.2018.2826038

215. Larsson, D., Kotsalis, G., and Tsiotras, P., "Nash and Correlated Equilibria for Pursuit-Evasion Games Under Lack of Common Knowledge," *57th IEEE Conference on Decision and Control*, Miami, FL, Dec. 17–19, 2018, pp. 3579–3584. doi: 10.1109/CDC.2018.8619168

216. Makkapati, V. R., Dor, M., and Tsiotras, P., "Trajectory Desensitization in Optimal Control Problems," *57th IEEE Conference on Decision and Control*, Miami, FL, Dec. 17–19, 2018, pp. 2478–2483. doi: 10.1109/CDC.2018.8619577

217. Hawkins, K., and Tsiotras, P., "Anticipating Human Collision Avoidance Behavior for Safe Robot Reaction," *57th IEEE Conference on Decision and Control*, Miami, FL, Dec. 17–19, 2018, pp. 6301–6306. doi: 10.1109/CDC.2018.8619849

218. Ridderhoff, J., and Tsiotras, P., "Minimum-fuel Powered Descent in the Presence of Random Disturbances," *AIAA SciTech Forum, Guidance, Navigation, and Control*, San Diego, CA, Jan. 7–11, 2019 (**best student paper award**). doi: 10.2514/6.2019-0646

219. Antonello, A., Valverde, A., and Tsiotras, P., "Free-flying Spacecraft-mounted Manipulators: A Tool for Simulating Dynamics and Control," *AIAA SciTech Forum, Guidance, Navigation, and Control*, San Diego, CA, Jan. 7–11, 2019. doi: 10.2514/6.2019-1912

220. Okamoto, K. and Tsiotras, P., "Optimal Stochastic Vehicle Path Planning Using Covariance Steering," *International Conference on Robotics and Automation*, Montreal, Canada, May 20–24, 2019, pp. 2276–2281. doi: 10.1109/LRA.2019.2901546

221. Joshi, S. and Tsiotras, P., "Non-Parametric Informed Exploration for Sampling-Based Motion Planning," *International Conference on Robotics and Automation*, Montreal, Canada, May 20–24, 2019, pp. 5915–5921. doi: 10.1109/ICRA.2019.8793933

222. Okamoto, K. and Tsiotras, P., "Input Hard Constrained Optimal Covariance Steering," *58th IEEE Conference on Decision and Control*, Nice, France, Dec. 11–13, 2019, pp. 3497–3502.

223. Ridderhof, J., Okamoto, K. and Tsiotras, P., "Nonlinear Uncertainty Control with Iterative Covariance Steering," *58th IEEE Conference on Decision and Control*, Nice, France, Dec. 11–13, 2019, pp. 3484–3490.

224. Ridderhof, J., and Tsiotras, P., "Stochastic Atmosphere Modeling for Risk-Adverse Aerocapture Guidance," *IEEE Aerospace Conference*, Big Sky, Montana, March 7–14, 2020.

225. Lim, J., and Tsiotras, P., "MAMS-A*: Multi-Agent Multi-Scale A*," *International Conference on Robotics and Automation*, Paris, France, May 31–June 4, 2020.

226. Makkapati, V. R., Maity, D., Dor, M., and Tsiotras, P., "C-DOC: Co-State Desensitized Optimal Control," *American Control Conference*, Denver, CO, July 1–3, 2020.

227. Ridderhof, J., Pilipovsky, J., and Tsiotras, P., "Chance-Constrained Covariance Control for Low-Thrust Minimum-Fuel Trajectory Optimization," *AIAA/AAS Astrodynamics Specialists Conference*, South Lake Tahoe, CA, August 9-13, 2020.

228. Driver, T., Dor, M., Skinner, A., and Tsiotras, P., "Shape Carving in Space: A Visual SLAM Approach to 3D Shape Reconstruction of a Small Celestial Body," *AIAA/AAS Astrodynamics Specialists Conference*, South Lake Tahoe, CA, August 9-13, 2020.

Accepted Conference Proceedings

229. Lawson, R. C, Wills, L., and Tsiotras, P., "GPU Parallelization of Policy Iteration RRT#" *International Conference on Intelligent Robots and Systems*, Las Vegas, NV, Oct. 25–29, 2020.

230. Joshi, S., and Tsiotras, P., "Relevant Region Exploration on General Cost-Maps for Sampling-Based Motion Planning," *International Conference on Intelligent Robots and Systems*, Las Vegas, NV, Oct. 25–29, 2020.

231. Makkapati, V. R., Sarabu, H., Comandur, V., Tsiotras, P., and Hutchinson, S., "Safe Optimal Control under Parametric Uncertainties," *International Conference on Intelligent Robots and Systems*, Las Vegas, NV, Oct. 25–29, 2020.

232. Makkapati, V. R., Rajpurohit, T., Okamoto, K., and Tsiotras, P., "Covariance Steering for Discrete-Time Linear-Quadratic Stochastic Dynamic Games," *59th IEEE Conference on Decision and Control*, Jeju Island, South Korea, Dec. 8–11, 2020.

233. Ridderhof, J., Okamoto, K., and Tsiotras, P., "Chance Constrained Covariance Control for Linear Stochastic Systems With Output Feedback," *59th IEEE Conference on Decision and Control*, Jeju Island, South Korea, Dec. 8–11, 2020.

234. Ridderhof, J., Makkapati, V. R., and Tsiotras, P. "Stochastic Numerical-Predictor Corrector Guidance for Drag Modulation Aerocapture," *IEEE Aerospace Conference*, Big Sky, Montana, March 6–13, 2021.

235. Makkapati, V. R., Ridderhof, J., Hart, J., van Bloemen Waanders, B., and Tsiotras, P. "Desensitized Trajectory Optimization for Hypersonic Vehicles," *IEEE Aerospace Conference*, Big Sky, Montana, March 6–13, 2021.

236. King-Smith, M., Dor, M., Valverde, A., and Tsiotras, P., "Nonlinear Dual Quaternion Control of Spacecraft-Manipulator Systems," *international Symposium on Artificial Intelligence, Robotics and Automation in Space*, Pasadena, CA, Oct. 18–21, 2020.

237. Ridderhof, J., and Tsiotras, P., "Planetary Entry in a Randomly Perturbed Atmosphere," *AIAA SciTech Forum, Guidance, Navigation, and Control*, Nashville, TN, Jan. 11–15, 2021.

238. Lang, K., Klett, C., Hawkins, K., Feron, E., Tsiotras, P., and Phillips, S., "Formal Verification Applied to Autonomous Spacecraft Attitude Control," *AIAA SciTech Forum, Guidance, Navigation, and Control*, Nashville, TN, Jan. 11–15, 2021.

239. Zheng, D., and Tsiotras, P., "Near-Optimal Finite-Time Feedback Controller Synthesis Using Supervised and Unsupervised Learning," *AIAA SciTech Forum, Guidance, Navigation, and Control*, Nashville, TN, Jan. 11–15, 2021.

240. Zheng, D., and Tsiotras, P., "Sampling-based Kinodynamic Motion Planning Using a Neural Network Controller," *AIAA SciTech Forum, Guidance, Navigation, and Control*, Nashville, TN, Jan. 11–15, 2021.

241. Goddard, Z., Wardlaw, K., Krishnan, R., Tsiotras, P., Smith, M., Sena, M. R., Parish, J., and Mazumdar, A. "Utilizing Reinforcement Learning to Continuously Improve a Primitive-Based Motion Planner," *AIAA SciTech Forum, Guidance, Navigation, and Control*, Nashville, TN, Jan. 11–15, 2021.

## D. Other Publications

### Book Reviews

1. *Dynamics and Control* by G. Leitmann, F. E. Udwadia, and A. V. Kryazhimskii (eds.), Gordon Breach, in *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 25, No. 2, p. 415–416, 2002.

2. *Optimal Control with Engineering Applications* by H. P. Geering, Springer, in *IEEE Control Systems Magazine*, Vol. 31, No. 5, p. 115–117, 2011, doi: 10.1109/MCS.2011.942047.

### Position Papers

1. "Trains, Planes, and Automobiles," (with E. Feron and M. Wolf) *2011 Workshop for Developing Dependable and Secure Automotive Cyber-Physical Systems from Components*, Tory, MI, March 17–18, 2011.

2. "The Case for Passenger Customized Automotive Active Safety Systems: Motivation, Challenges, Opportunities," *2014 National NSF Workshop on Transportation Cyber-Physical Systems*, Arlington, VA, January 22–23, 2014.

**E. Presentations**

<u>Invited Seminars</u>

- Dept. of Eng. Mech. and Astronautics, Univ. of Wisconsin, Madison, WI, April 6, 1993
- Dept. of Aeronautics and Astronautics, Stanford University, Stanford, CA, June 1, 1993
- Dept. of Mechanical and Aerospace Eng., Univ. of California, Irvine, CA, June 7, 1993
- Guidance and Control Branch, Jet Propulsion Laboratory, Pasadena, CA, June 8, 1993
- Dept. of Aerospace Engineering, Univ. of Michigan, Ann Arbor, MI, July 7, 1993
- Dept. of Mechanical, Aerospace and Nuclear Eng., Univ. of Virginia, Charlottesville, VA, April 13, 1994
- Dynamics and Controls Branch, NASA LaRC, Hampton, VA, April 7, 1995
- Dept. of Aerospace Eng., Univ. of Illinois, Urbana-Champaign, IL, Sept. 25, 1995
- Dept. of Electrical Engineering, Univ. of Virginia, Charlottesville, VA, Oct. 27, 1995
- Guidance and Control Branch, NASA GSFC, Greenbelt, MD, Nov. 9, 1995
- Electromechanical Systems Branch, NASA GSFC, Greenbelt, MD, Feb. 14, 1996
- Dept. of Mechanical Engineering, Univ. of Maryland, College Park, MD, Sept. 24, 1996
- Guidance and Control Branch, Jet Propulsion Laboratory, Pasadena, CA, Dec. 15, 1997
- Guidance and Control Group, Hughes Space Systems, El Segundo, CA, Dec. 12, 1997
- Dept. of Aerospace and Ocean Eng., Virginia Tech, Blacksburg, VA, Feb. 16, 1998
- School of Aerospace Engineering, Georgia Institute of Technology, Atlanta, GA, April 13, 1998
- Dept. of Aerospace Engineering, Univ. of Michigan, Ann Arbor, MI, May 11, 1998
- Spacecraft Engineering Dept., NRL, Washington, DC, Oct. 14, 1998
- Dept. of Mechanical Engineering, University of Houston, Houston, TX, March 22, 2000
- Controls Group (Projet SOSSO), INRIA Rocquencourt, France, November 27, 2000
- Controls Group (Projet SOSSO), INRIA Rocquencourt, France, November 29, 2000
- Magnetic Bearings Center, ETH Zürich, Switzerland, June 21, 2001
- Centre Autom. et Systemes, Ecole de Mines, Fontainebleau, France, March 15, 2003
- Surrey Space Center, University of Surrey, Guildford, United Kingdom, April 17, 2003
- Centre de Mathématiques Appliquées, Ecole des Mines de Paris, Sophia Antipolis, France, May 12, 2003
- Space Vehicles Directorate, AFRL, Kirtland AFB, Albuquerque, NM, October 14, 2003
- Space Vehicles Directorate, AFRL, Kirtland AFB, Albuquerque, NM, October 15, 2003
- Guid., Nav. and Control Systems Eng., NASA GSFC, Greenbelt, MD, Nov. 18, 2003
- Guid., Nav. and Optimization Branch, NASA MSFC, Huntsville, AL, April 20, 2005
- Dept. of Mechanical and Process Engineering, ETH Zürich, Switzerland, Dec. 20, 2006
- Space Vehicles Directorate, AFRL, Kirtland AFB, Albuquerque, NM, February 16, 2006
- Dept. of Mechanical Engineering, The University of New Mexico, *Mechanical Engineering Excellence Seminar Speaker* series, February 17, 2006
- Dept. of Mechanical and Aerospace Engineering, UCLA, June 9, 2006
- Guidance and Control Branch, Jet Propulsion Laboratory, Pasadena, CA, May 9, 2007

- Dept. of Electrical, Computer and Systems Engineering, Rensselaer Polytechnic Institute, Troy, NY, October 22, 2007.
- Active Safety Group, Ford Motor Company, Dearborn, MI, September 3, 2008.
- Control Systems Laboratory, Department of Mechanical Engineering, National Technical University of Athens (NTUA), Greece, November 27, 2008.
- Dept. of Aerospace Engineering, UIUC, Champaign, IL, October 19, 2009.
- Dept. of Aeronautics and Astronautics, Purdue Univ., West Lafayette, IN, Oct. 20, 2009.
- Dept. of Electrical Engineering and Computer Sciences, University of California at Berkeley, Berkeley, CA, November 3, 2009.
- Decision and Control Seminar Series, Georgia Inst. of Tech., Atlanta, GA, Jan. 22, 2010.
- Air Transportation Center, School of Industrial and Systems Engineering, Georgia Inst. of Tech., GA, April 27, 2010.
- Dept. of Mechanical and Aerospace Engineering, Rutgers University, Oct. 6, 2010.
- Dept. of Mechanical and Aerospace Engineering, Cornell University, Feb. 10, 2012.
- Dept. of Aerospace Engineering, University of Michigan, March 19, 2012.
- Army Research Lab, Vehicle Technology Directory, Aberdeen, Maryland, May 24, 2012
- Centre Automatique et Systèmes, Mines-ParisTech, France, June 13, 2013
- PSA Peugeot-Citroën Research Center, Velizy, France, June 17, 2013.
- Laboratoire d'Analyse et d'Architecture des Systèmes (LAAS), Humanoid Motion Group, Toulouse, France, July 10, 2013.
- Robotics and Mobility Branch, JPL, Pasadena, CA, June 13 & 18, 2014
- Laboratory of Information and Decision Systems, Inference and Control seminar series, MIT, Cambridge, MA, October 2, 2014.
- Oak Ridge National Laboratory, Knoxville, TN, October 5, 2014.
- ATK Spacecraft Systems and Services, Washington, DC, November 20, 2014.
- Boston University, Center for Information and Systems Engineering, Boston, MA, December 5, 2014.
- The Charles Stark Draper Laboratory, Guidance and Control and Division, Dec. 19, 2014.
- Mitsubishi Electric Research Laboratories, Cambridge, MA, February 3, 2015.
- Dept. of Mechanical and Aerospace Engineering, Worcester Polytechnic Institute, Worcester, MA, February 4, 2015.
- The Charles Stark Draper Laboratory, Guidance and Control and Division, Feb. 23, 2015.
- Laboratory for Information and Decision Systems, LIDS seminar series, MIT, Cambridge, MA, April 14, 2015.
- United Technologies Research Center, Embedded Systems & Networks Group, Hartford, CT, May 14, 2015.
- Dept. of Mechanical Engineering, MIT, Cambridge, MA, May 22, 2015.
- Naval Research Laboratory, Washington, DC, August 13, 2015.
- Space Vehicles Directorate, AFRL, Kirtland AFB, Albuquerque, NM, August 19, 2015.
- Institute for Human and Machine Cognition, Pensacola, FL, October 20, 2015.
- Guidance & Controls Section, JPL, Pasadena, CA, June 12, 2017.
- Decision and Control Seminar Series, Georgia Inst. of Tech., Atlanta, GA, Oct. 20, 2017.
- Dept. of Aeronautics and Astronautics, *Distinguished Speaker* series, University of Washington, Seattle, WA, November 20, 2017.

- Dept. of Aerospace Engineering and Engineering Mechanics, Univ. of Texas at Austin, TX, March 29, 2018.
- Dept. of Aerospace Engineering and Engineering Mechanics, Univ. of Texas at Austin, TX, May 17, 2018.
- Dept. of Aerospace Engineering, Texas A&M, College Station, TX, October 10, 2018.
- NASA Goddard Space Flight Center, November 17, 2018.
- Dept. of Electrical and Computer Engineering, Royal Institute of Technology (KTH), Stockholm, Sweden, February 22, 2019.
- Dept. of Aerospace Engineering, *Chair's Distinguished Seminar Speaker* series, University of Michigan, Ann Arbor, MI, February 28, 2019.
- Dept. of Electrical and Computer Engineering, University of Southern California, Los Angeles, CA, April 5, 2019.
- Ecole Nationale de l'Aviation Civile, Toulouse, France, February 18, 2020.

Conference, Workshop and Keynote Presentations

- "The Effect of Coordinates on SO(3) for Attitude Analysis, Stabilization, and Control Problems," *2nd World Congress of Nonlinear Analysis*, Athens, Greece, July 10-17, 1996. (invited).
- "Spacecraft/Aircraft Control under Actuator and Sensor Failures," *Virginia Consortium of Engineering and Sciences Universities Conference*, Old Dominion University, June 11-12, 1997.
- "Control of Energy/Momentum Storage Flywheels," *Virginia Consortium of Engineering and Sciences Universities Conference*, Old Dominion Univ., June 11-12, 1997.
- "Robust Control Design for an Active Magnetic Bearing/Flywheel System," with S. Djouadi, P. Allaire, and R. Bartlett, *Aerospace Flywheel Workshop*, Glenn Research Center, Cleveland, OH, Oct. 18-20, 1999.
- "Robust Control of High-Speed Flywheels on Active Magnetic Bearings for Spacecraft Applications," with J. Luo, Space Power Workshop, Torrance, CA, April 10–13, 2000.
- "Flywheel Battery Magnetic Bearing Controller Design and Verification," with J. Luo, S. Djouadi, R. Bartlett, P. Allaire, E. Hilton, and U. Schönhoff, Space Power Workshop, Torrance, CA, April 10–13, 2000 (invited).
- "Zero and Low-Bias AMB Flywheel Control: Theory and Experimental Setup," with B. Wilson, *Aerospace Flywheel Workshop*, Glenn Research Center, Cleveland, OH, March 14–15, 2002.
- "An Experimental Test-Bed for Low-Loss Control Design of AMBs," with B. Wilson and J. Fausz, *Aerospace Flywheel Workshop*, Fort MacArthur, Los Angeles AFB, CA, Aug. 6–8, 2003.
- " Aggressive Maneuvering of Ground Vehicles over Rough Terrain and Uncertain Environments: Key Issues and Possible Approaches," *ARO/MIT Workshop on Mobility and Control in Challenging Environments*, Olin College, MA, Oct. 5–6, 2006.
- "Advanced Methods for Intelligent Flight Guidance and Planning in Support of Pilot Decision Making," *NASA Aviation Safety Technical Conference*, Denver, CO, Oct. 21-23, 2008.
- "Achieving Increased Mobility And Autonomy For Ground Vehicles Over Rough Terrain," with R. Cowlagi, *26th Army Science Conference*, Orlando, FL, Dec. 1–4, 2008.
- "Robust Aircraft Optimal Trajectory Generation," Tutorial Workshop on Methods for Optimal Trajectory Design, *5th International Conference on Research in Air Transportation*, Berkeley, CA, May 22-25, 2012.

- "Robust Aircraft Optimal Trajectory Generation," *5th Aerospace Decision and Control Workshop*, Atlanta, GA, June 11-12, 2012.

- "Fast and Furious: The Next Generation of (Semi-)Autonomously Driving Vehicles," *France-Atlanta Symposium on Optoelectronics and Robotics in Automotive*, Atlanta, GA, October 26, 2012.

- "Linking High-Level Planning Specifications with Low-Level Motion Primitives Using Transition Histories in Cell Decomposition Graphs," R. Cowlagi and P. Tsiotras, *2nd NSF Workshop on Formal Composition of Motion Primitives*, part of the Cyber-Physical Systems Week (CPSWeek) 2013, Philadelphia, PA, April 8, 2013.

- "Robust and Numerically Efficient Aircraft Optimal Trajectory Generation for Emergency Landing," keynote speaker, *2nd International Conference on Interdisciplinary Science for Air Traffic Management*, Toulouse, France, July 8–10, 2013.

- "Real-Time Near-Optimal Feedback Control of Aggressive Vehicle Maneuvers," Workshop on *Optimization and Optimal Control in Automotive Systems*, Linz, Austria, July 15–16, 2013.

- "Intelligent Systems" invited panelist, *Army Science Planning and Strategy Meeting on Intelligent Systems*, Potomac, Maryland, November 12–13, 2013.

- "Advances in Autonomous Vehicle Control," Workshop on *Intelligent Vehicles*, PSA Peugeot Citroën Technical Center, Vélizy, France, November 14, 2013.

- "Connected Vehicles and Automation," keynote speaker, *NSF 2014 Transportation CPS Workshop*, Arlington, VA, January 23–24, 2014.

- "Machine Learning and Dynamic Programming Algorithms for Motion Planning and Control," with O. Arslan, *New England Machine Learning Day*, Microsoft Corporation, Cambridge, MA, May 18, 2015.

- "Towards an Algorithmic Control Theory for Control," *NSF Workshop on Control, Perception and Learning*, Arlington, VA, August 25–26, 2015.

- "Dynamic Programming Principles for Sampling-Based Motion Planners," with O. Arslan, *Optimal Robot Motion Planning Workshop* in the *IEEE International Conference on Robotics and Automation*, Seattle, WA, May 30, 2015.

- "Satisficing Mechanisms for Enabling Real-Time Perception and Action in Vehicle Autonomy," *ONR Unmanned Maritime Systems Technology Forum*, Miramar Beach, FL, February 1–4, 2016.

- "Computing Optimal Trajectories: From Continuous to Discrete and from Deterministic to Stochastic and Back," Allerton Conference pre-symposium tutorial, Allerton, IL, September 27, 2016.

- "Application of ORB-SLAM to Spacecraft Non-Cooperative Rendezvous," with M. Dor, *Space Robotics and Systems Workshop on Space Robotics*, Boston, MA, July 15, 2017.

- "Computing Optimal Trajectories: From Continuous to Discrete and from Deterministic to Stochastic and Back," GT-MAP Workshop on Dynamics and Control, Atlanta, GA, August 18, 2017.

- "Recent Advances in Hierarchical and Sampling-Based Motion Planning," IROS 2017 Workshop on "Complex Collaborative Systems: Closing the Loop, Learning, and Self-Confidence," Vancouver, Canada, September 28, 2017.

- "The Next Frontier: The Challenges in Developing Truly Autonomous Space Robots," Keynote address, *5th IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE 2017)*, Montreal, Canada, October 12, 2017

- "Dual Quaternions as a Tool for Modeling, Control, and Estimation for Spacecraft Robotic Servicing Missions," with A. Valverde, *John L. Junkins Dynamical Systems Symposium*, Texas A&M University, College Station, TX, May 20-21, 2018.

- "Minimum-Fuel Powered Descent In The Presence Of Uncertainty," with J. Ridderhof, *2018 International Planetary Probe Workshop*, Boulder, CO, June 11–15, 2018.
- "Optimal Strategies and Task Allocation in Multi-Pursuer Single-Evader Problems," with R. Makkapati, *18th International Symposium on Dynamic Games and Applications*, Grenoble, France, July 9–12, 2018.
- "Fast and Furious: Controlling Vehicles at the Limits of Performance," Workshop honoring John Hauser's 60th birthday, *American Control Conference*, Milwaukee, WI, June 26, 2018.
- "High-Fidelity Multi-Spacecraft Guidance Navigation and Control Simulation and Testing," with M. King-Smith, M. Dor, J. Stanhope, and J. Ma, *Space Innovation Symposium*, Atlanta, GA, Nov. 13-14, 2018.
- "Minimum-Fuel Powered Descent In the Presence of Uncertainty," with J. Ridderhof, *Space Innovation Symposium*, Atlanta, GA, Nov. 13-14, 2018.
- "Decision-Making for Intelligent CPS Systems Subject to Computational Constraints: Hierarchical Abstraction Approach," Workshop on *Computation-aware Algorithmic Design for Cyber-Physical Systems*, *57th IEEE Conference on Decision and Control*, Miami, FL, Dec. 16, 2018.
- "Time-Informed Exploration for Robot Motion Planning," with S. Joshi and S. Hutchinson, Workshop on *Machine Learning in Planning and Control Robot Motion*, *International Conference on Robotics and Automation*, Paris, France, May 31, 2020.
- "Apollonius Allocation Algorithm for Heterogeneous Pursuers to Capture Multiple Evaders," with V. R. Makkapati, Workshop on Heterogeneous Multi-Robot Task Allocation and Coordination, *Robotics Science and Systems*, Corvalis, OR, July 12-16, 2020.

## F. Other Scholarly Accomplishments

Patents

(a) "Control of Magnetic Bearing-Supported Rotors," R. Bartlett, P. Tsiotras and P. Allaire, U.S. Patent No. 6,267,876 B1, (issued July 31, 2001).
(b) "System For Vehicle Control To Mitigate Intersection Collisions And Method Of Using The Same," J. Lu, P. Prasad, P. Tsiotras, E. Velenis, and D. Filev, US Patent No. 8577550 (issued November 8, 2013).
(c) "Dual Quaternions for Dynamics & Control of Spacecraft with Robotic Arms," D. S. Bayard, P. Tsiotras, A. Valverde, US Patent Application No. 62/591,927 (filled November 29, 2017).
(d) "Autonomous Vehicle Research System," B. Goldfain, P. Drews, G. Williams, E. Theodorou, J. Rehg, P. Tsiotras, US Patent No. 10,296.003 (issued May 21, 2019).

# V. Service

## A. Professional Contributions

Associate Editorships

- *Encyclopedia of Systems and Control*, Section Editor, 2019–
- *Frontiers in Robotics and AI*, Specialty Chief Editor in the area of Space Robotics, 2015–
- *Dynamic Games and Applications*, Associate Editor, 2019–
- *Entropy*, special issue on "Information Theory for Path Planning and Control," Guest Editor, 2020–
- *AIAA Journal of Guidance, Control, and Dynamics*, special issue on "Computational Guidance and Control," Guest-Editor, 2015–2016

- *International Journal of Vehicle Autonomous Systems*, special issue on "Autonomous and Semi-Autonomous Control for Safe Driving of Ground Vehicles," Guest-Editor, 2008–2009
- *IEEE Transactions on Automatic Control*, Associate Editor, 2009–2011.
- *IEEE Control Systems Magazine*, Associate Editor, 2003–2009.
- *AIAA Journal of Guidance, Control, and Dynamics*, Associate Editor, 1999–2007.
- *Dynamics and Control: An International Journal* (merged with the *Journal of Dynamical and Control Systems*), Associate Editor, 2000–2002.

## Membership to Professional Societies

American Institute of Aeronautics and Astronautics (AIAA) – Fellow
Institute of Electrical and Electronics Engineers (IEEE) – Fellow
American Astronautical Society (AAS) – Fellow
Society of Professional Engineers of Greece (TEE) – Member

## Professional Consulting

- Expert technical evaluator of self-driving vehicle technology for investment banks.

## Session and Workshop Organizer

- Joint ARL/UPenn/GaTech workshop on "Games in Multi-Agent Environments," January 16, 2020, Georgia Tech, Atlanta, GA.
- 58th IEEE Conference on Decision and Control (with E. Bakolas, Y. Chen, and T. Georgiou), workshop on "Uncertainty Synthesis," December 10, 2019, Nice Acropolis, France.
- 57th IEEE Conference on Decision and Control (with M. Mesbahi), invited session on "Algorithmic Control Theory I & II," December 16, 2018, Miami, FL.
- 56th IEEE Conference on Decision and Control (with M. Mesbahi), invited session on "Algorithmic Control Theory," December 12, 2017, Melbourne, Australia.
- 55th IEEE Conference on Decision and Control (with E. Feron and E. Theodorou), workshop on "Perception, Control and Planning for Agile Autonomous Agents," December 11, 2016, Las Vegas, NV.
- IEEE International Conference on Robotics and Automation (with A. Censi and S. Soatto), invited workshop on "Task-driven Perceptual Representations: Sensing, Planning and Control under Resource Constraints," May 16–21, 2016, Stockholm, Sweden.
- 51th IEEE Conference on Decision and Control (with J. Lu and S. Di Cairano), invited session on "Integrated Vehicle Dynamics and Control", Dec. 10–13, 2012, Maui, HI.
- 5th International Conference on Research in Air Transportation (with E. Feron, D. Delahaye and S. Puechmorel), Workshop on "Methods for Optimal Trajectory Design", May 22, 2012, Berkeley, CA.
- 50th IEEE Conference on Decision and Control (with J. Lu), invited session on "Integrated Vehicle Dynamics and Control - I and II", Dec. 12–15, 2011, Orlando, FL.
- 49th IEEE Conference on Decision and Control (with J. Lu and F. Borelli, invited session on "Integrated Vehicle Dynamics and Control", Dec. 15–17, 2010, Atlanta, GA.
- 48th IEEE Conference on Decision and Control (with J. Lu, Z. Lin, X.-Y. Lu), invited session on "Integrated Vehicle Dynamics and Control - I and II", Dec. 16–18, 2009, Shanghai, China.

- American Control Conference, (with C. Canudas de Wit), invited session on "Control Techniques for Improved Vehicle Handling and Stability", June 28–30, 2000, Chicago, IL.
- Workshop on the Integration of Engineering Research and Education, NSF, Session on "Partnership with Industry: Benefits and Pitfalls" (session facilitator), Nov. 9–10, 1998, Arlington, VA.

Review Panels

- National Science Foundation (NSF)
- National Aeronautics and Space Administration (NASA)
- Army Research Office (ARO)
- Air Force Office for Scientific Research (AFOSR)
- Office of Naval Research (ONR)
- Israel Science Foundation (ISF)
- National Academy of Engineering (NAE), Panel on Review of Laboratory Independent Research in Computational Sciences at the Army?s Research, Development, and Engineering Centers

Professional Committees and Service

- IEEE Connected and Automated Vehicles Symposium, Technical Program Co-Chair, 2019.
- International Conference on Robotics and Automation (ICRA), Associate Editor, 2018.
- 18th Towards Autonomous Robotic Systems (TAROS) Conference, Program Committee Member, 2016–2017
- AIAA Space Automation and Robotics (SAR) Technical Committee, Member, 2015 –
- Best Student Paper Selection Committee, American Control Conference, Member, 2014
- External Evaluation Committee, Dept. of Mechanical Engineering and Aeronautics, University of Patras, Chairman, 2013
- AIAA Fellow Selection Committee, Member, 2010
- AIAA Guidance, Navigation and Control (GNC) Technical Committee, Member, 2008 – 2011
- MAG'97 Magnetic Bearings and Dry Gas Seals Conference and Exhibition, Organizing Committee Member, 1996–1997
- 6th International Symposium on Magnetic Bearings, International steering committee member, 1997–1998
- ASME Dynamic Systems and Control Committee, Automotive Transportation Panel, Member, 1999 – 2011
- 13th IEEE Mediterranean Conference on Control and Automation International program committee member, 2004–2005
- 1st International Conference on Robot Communication and Coordination (ROBOCOMM), International program committee member, 2007
- 9th Annual Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), National Research Conference, Judge, October 22–26, 2008
- 2nd International Conference on Robot Communication and Coordination (ROBOCOMM), International program committee member, 2009
- IEEE Senior Member Selection Committee, Member, 2009

- 19th IEEE Mediterranean Conference of Control and Automation, organizing committee member (invited workshops chairman), 2010–2011

## B. Campus Contributions

Georgia Institute of Technology

- AE School, Periodic Performance Review Committee, Chair 2020–
- AE School, Reappointment, Tenure and Promotion Internal Review Committee, Member, 2019–2020
- ECE School, Julian Hightower Jr., Faculty Search Committee, Member, 2018–2019
- Sigma Xi Best PhD Thesis Award Institute Committee, Member, 2018
- AE School, Autonomy Area Faculty Search Committee, Chairman, 2017–2018
- AE School, Flight Mechanics and Control Area Faculty Search Committee, Chairman, 2017–2018
- Associate Director for Research, Institute for Robotics and Intelligent Machines, 2016–
- AE School, Graduate Curriculum Committee, Member, 2016–
- AE School, Space Systems Area Faculty Search Committee, Member, 2016–2017
- AE School, Autonomy Area Faculty Search Committee, Member, 2016–2017
- AE School, Strategic Plan Committee, Member, 2013–2014
- AE School, Autonomy Area Faculty Search Committee, Chairman, 2013–2014
- ChBE School, Reappointment, Tenure and Promotion Internal Review Committee, Member, 2013
- AE School, Flight Mechanics and Control Area Faculty Search Committee, Member, 2012–2013
- Sigma Xi Undergraduate Research Award Institute Committee, Member, 2012
- AE School, Space Systems Area Faculty Search Committee, Member, 2011–2012
- AE School, Reappointment, Tenure and Promotion Committee, Member, 2011–2014
- College of Engineering, Research Faculty Promotion Committee, Member, 2010–2012
- AE School, Graduate Quality Enhancement Committee, Member, 2010–2012
- AE School, Reappointment, Tenure and Promotion Internal Review Committee, Member, 2010–2011
- College of Engineering, Reappointment, Tenure and Promotion Committee, Member, 2008–2010
- AE School, Space Systems Area Faculty Search Committee, Member, 2006–2009
- AE School, Reappointment, Tenure and Promotion Internal Review Committee, Chairman, 2007–2009
- AE School, Periodic Peer Review Committee, Chairman, 2005–2006
- AE School, Dutton/Ducoffe Endowed Chair Faculty Search Committee, Chairman, 2004–2005
- AE School, Five-Year Strategic Plan Committee, Member, 2005–2007
- AE School, Propulsion Area Faculty Search Committee, Member, 2004
- AE School, FMC Honors Curriculum Committee, Member, 1998–
- AE School, FMC Ph.D. Qualifying Examination Committee, Member, 1998–
- AE School, FMC Curriculum Committee, Member, 1998–

    – AE School, Undergraduate Education Enhancement Committee, Member, 2000–2005

    – AE School, Student Honors Program Committee, Member, 2001–2018

    – AE School, Graduate Committee, Member, 2000–

    – AE School, Laboratory Facilities Committee, Member, 2000–2010

    – AE School, Andrew and David Lewis Endowed Chair Faculty Search Committee, Member, 1999–2002

University of Virginia

    – MANE Department, Dynamics and Control Committee, Member, 1994–1998

    – MANE Department, Dynamics and Control Comprehensive Examination Committee, Member, 1994–1998

    – MANE Department, Computer Committee, Member, 1996–1998

    – SEAS, ENGR 207 Undergraduate Curriculum Committee, Member, 1997–1998

## VI. Grants and Contracts

### A. As Principal Investigator

1. "A User-Friendly Environment for Numerical Solution of Optimal Control Problems," amount $5,000, NSF (REU Program), May 1997–Sept. 1997.

2. Carlos E. Farrar Fellowship (for Haijun Shen), amount $6,000, SEAS, Univ. of Virginia, Sept 1997–May 1998.

3. "CAREER: Robust and Optimal Control of Nonlinear Mechanical Systems with Rotating Components," amount $220,000, NSF, June 1996 – May 2000.

4. "Robust and Optimal Control of Nonlinear Mechanical Systems with Rotating Components," amount $107,000, NSF, June 1996 – May 1999, (supplement to CAREER award).

5. "Nonlinear Control Laws for Low Loss Magnetic Bearings," amount $25,000, AFS, Inc., June 1998–May 1999.

6. "Advanced Control Techniques for Energy Storage Flywheel Magnetic Bearings," amount $128,592, AFS, Inc., Jan. 1999–Dec. 2000.

7. "Non-smooth Feedback Control of Nonholonomic Systems with Applications to Mobile Robots," amount $16,000, NSF, (France-NSF Cooperation Program), Mar. 1998 – Feb. 2001.

8. "Attitude Control of Small Sats using Magneto-Torquers," amount $5,000, NSF (Research Experience for Undergraduates Program), Mar. 1998–May 1999.

9. "Analysis and Control of High-Speed Wheeled Mobile Robots," amount $235,000, Army Research Office, June 2000–May 2003.

10. "Robust Gain-Scheduling Control for High-Speed Gyroscopic Rotors Supported on Magnetic Bearings" amount $250,000, American Flywheel Systems, Inc., June 2000–December 2001.

11. "Nonlinear Spacecraft Control with Applications to Combined Attitude Tracking and Energy Storage," amount $300,000, AFOSR, August 2000–July 2003.

12. "Numerical Nonlinear and Optimal Control Using Wavelets," amount $175,000, NSF/CMS, September 2000–August 2003.

13. "Upgrade of AE4520 Undergraduate Controls Laboratory," amount $25,100, Technology Fee Program, Georgia Tech, October 2000.

14. "A Spacecraft Simulator for Undergraduate Education," amount $10,000, Technology Fee Program, Georgia Tech, October 2001.

15. "DURIP: A Simulator Facility for Attitude Control and Energy Storage of Spacecraft," amount $230,000, AFOSR, April 2001–March 2002.

16. "Experimental Validation of Zero- and Low-Bias Control Algorithms for Active Magnetic Bearings," amount $45,000, AFRL/AFOSR, January 2002–December 2002.

17. "Coordinated Resource Allocation Among Multiple Agents with Application to Autonomous Refueling and Servicing of Satellite Constellations," amount $303,027, AFOSR, Jan. 2004–Dec. 2007.

18. "On-Line Path Generation and Tracking for High-Speed Wheeled Autonomous Vehicles," amount $325,366, ARO, Feb. 2005–Feb. 2008.

19. "Control of Vehicles at High-Speed over Rough Terrain: The Effect of Vehicle Modalities," amount $100,000, Army Research Office, Sept. 2007–Feb. 2009.

20. "Wavelets in Control and Optimization," amount $160,000, NSF/CMS, Sept. 2005-Aug. 2007.

21. "Control and Recovery of Vehicles During High-Speed and Other Abnormal Conditions," amount $120,000, Ford Motor Co., Jan. 2006–Dec. 2008.

22. "DURIP: A 5-DOF Test-Bed for Autonomous Spacecraft Rendezvous and Docking," amount $237,500, AFOSR, April 2006–March 2007.

23. "GOALI: Next Generation Active Safety Control Systems for Crash-Avoidance of Passenger Vehicles Using Expert Driver Knowledge," (Co-PIs: J. Lu and E. Velenis), amount $274,000, NSF/CMII, Sept. 2007–Aug. 2010.

24. "Advanced Methods for Intelligent Flight Guidance and Planning in Support of Pilot Decision Making," (Co-PI: E. Johnson) amount $701,858 ($350,000), NASA, Oct. 2007–Sept. 2010.

25. "High Performance Satellite Pointing Algorithm Development and Testing," amount $90,000, SAIC, Feb. 2008-Dec. 2008.

26. "Synthetic Automotive Virtual Environments," amount $290,000, US Army, ERDC-CRREL and Vehicle Control Training, LLC, Sept. 2008-Aug. 2010.

27. "Multiscale, Beamlet-Based Data Processing for the Solution of Shortest-Path Problems with Applications to Embedded Vehicle Autonomy," (Co-PI: X. Huo), amount $185,000 ($95,000), NSF, Oct. 2009-Aug. 2011.

28. "Advanced Algorithm Development and Testing for Autonomous Operation of Small Satellites in Space," amount $500,000, Star Technologies, May 2010-March 2011.

29. "MURI: Neuro-Inspired Adaptive Perception and Control for Agile Mobility of Autonomous Vehicles in Uncertain and Hostile Environments," (Co-PIs: J. Rehg, F. Dellaert, E. Feron, L. Itti, USC, E. Frazzoli, MIT, K. Iagnemma, MIT) amount $6,250,000 ($750,000), ARO, Oct. 2010-Sept. 2015.

30. "DURIP: A Scaled Automotive Platform for Validation and Testing of Perception and Control Algorithms for Unmanned Ground Vehicles Operating Under Extreme Driving Conditions," amount $98,000, ARO, July 2012-June 2013.

31. "GOALI: Advanced Driver Assistance and Active Safety Systems through Driver's Controllability Augmentation and Adaptation," (Co-PIs: L. Itti, USC, J. Lu, Ford Motor Co.), amount $375,550 ($225,550), NSF/CMMI, Sept. 2012-Aug. 2015.

32. "Environment-Agent Interaction in Autonomous Networked Teams with Applications to Minimum-Time Coordinated Control of Multi-Agent Systems," amount $240,000, NSF/CMMI, Sept. 2012-Aug. 2015.

33. "Autonomous, Vision Based Satellite Proximity Operations for Inspection, Health Monitoring and Surveillance in Orbit," (Co-PIs: P. Vela, R. Russell, UTA), amount $820,000 ($375,000), AFRL, Nov. 2012–Oct. 2015.

34. "A Framework for Bounded Rationality Autonomy Using Neuromorphic Decision and Action Models," (Co-PIs: L. Itti, USC, S. Schaal, USC, S. Soatto, UCLA), amount $1,755,000, ($480,000), ONR, June 2013–May 2017.

35. "Autonomous Energy-Projecting Systems for Robotic Exploration of Extreme Environments," amount $27,000, C-STAR/JPL, May-June 2014.

36. "NRI: Information-Theoretic Trajectory Optimization for Motion Planning and Control with Applications to Space Proximity Operations," (Co-PI: E. Theodorou), amount $700,000 ($400,000), NSF, September 2014–August 2017.

37. "CPS: Synergy: Collaborative Research: Adaptive Intelligence for Cyber-Physical Automotive Active Safety - System Design and Evaluation," (Co-PIs: K. Feigh, L. Itti, USC), amount $800,000 ($300,000), NSF, September 2015–August 2018.

38. "Driver Behavior Characterization using Ford's BDD Data and its Usage for Discovery Project 20029," amount $25,000, Ford Motor Co., November 2015–May 2018.

39. "HSAP/URAP: Development and Implementation of Perception and Control Algorithms for Off-Road Autonomous Rally Driving Using a Scaled Automotive Platform," $12,000, ARO, May 2016–Sept. 2016.

40. "Covariance Steering Theory for Precise GN&C Terrain Relative Navigation during Entry, Descent and Landing," $25,000, C-STAR/JPL, May-June 2016.

41. "Statistical Mechanics for Learning Algorithmic-Based Controllers: The Role of Physics in New Computational Models for Real-Time Control," (Co-PIs: E. Theodorou, S. Karaman (MIT)), $350,000 ($130,000) , ARO, July 2016–June 2017.

42. "RI: Incremental Sampling-Based Algorithms and Stochastic Optimal Control on Random Graphs," $335,757, NSF, May 2016–April 2019.

43. "Dynamic Modeling of Articulated Space Robotic Spacecraft Using Dual Quaternions," $75,000, JPL/SURP, Nov. 2016–Oct. 2019.

44. "DURIP: A Testbed for Large-Scale Multi-Vehicle Autonomous Research," $160,000 (Co-PIs: E. Theodorou and J. Rehg), ONR, July 2017–June 2018.

45. "Covariance Steering Theory for Precise GN&C Terrain Relative Navigation during Entry, Descent and Landing," $27,000, C-STAR/JPL, June 2017.

46. "Stochastic Optimal Control for Powered Descent Guidance," $210,000, NASA Space Technology Research Fellowship (for Jack Ridderhof), Aug. 2017–Aug. 2020.

47. "Enabling Predictable Driving of Autonomous Vehicles in Highway Traffic," $50,000, Ford Motor Co., April 2017–May 2018.

48. "Optimal Strategies for Uncertain Differential Games with Applications" $396,000, NSF, June 2017–May 2020.

49. "Artificial Intelligence/Machine Learning to Improve Maneuvers of Robotic/Autonomous Systems," $60,000, Autonomous Solutions, Inc., Sept. 2017–Mar. 2018.

50. "Persistent Platform in Geosynchronous Earth Orbit," $27,258, Spaceworks, Sept. 2017–Dec. 2018

51. "Autonomous Multi-Spectral Relative Navigation, Active Localization, and Motion Planning in the Vicinity of an Asteroid," $500,000, NASA, Jan. 2018–Dec. 2020.

52. "Virtual Driver Path Planning/Following Using Reinforcement Learning and Learning from Demonstration," $216, 000, Ford Motor Co., Jan. 2018–Dec. 2019.

53. "Bounded-Rational Decision-Making Hierarchical Models for Autonomous Agents," $560,000, ONR, April 2018–March 2021.

54. "Support of VIP team on Active Safety for Autonomous Vehicles," $15,000, Sandia, Aug. 2018–July 2019.

55. "SA&S: Decision-Making for Autonomous Systems with Limited Resources," $422,797, NSF, February 2019–January 2022.

56. "Verification and Validation of Algorithms for Resilient Complex Software Spacecraft Control Systems," Verus Research (Co-PI: E. Feron), $225,000 ($125,000) , Aug. 2019–July 2021.

57. "Support of VIP team on Active Safety for Autonomous Vehicles," $20,000, Sandia, Aug. 2019–July 2020.

58. "Hyper-Differential Analysis to Mitigate Uncertainties for Control of Hypersonic Vehicles," $225,000, Sandia, Oct. 2019–Sept. 2022.

59. "Covariance Steering MPC Theory for Control Design of Off-Road Autonomous Vehicles," Autonomous Solutions, Inc., $350,000, Jan. 2020–Dec. 2021.

60. "Behavior Cloning with Structure for Decision Making in Traffic through Reinforcement Learning," $212,000, Ford Motor Co., Jan. 2020–Dec. 2022.

61. "RI: Small: Robust Autonomy for Uncertain Systems using Randomized Trees," $448,508, NSF, August 2020–July 2023.

## B. As Co-Principal Investigator or Investigator[1]

62. "Energy Momentum Wheels (EMW's) for Satellites and Other Applications with Gain-Scheduled Controllers" (Co-PI), amount $91,000 ($45,000), AFS, Inc., (NASA SBIR – Phase I), Feb. 1997 – July 1997.

63. "Design of a Magnetic Bearing Test Rig," (PI: P. Allaire), amount $24,000 ($10,000), RDC, Inc., Oct. 1995–Apr. 1996.

64. "Magnetic Bearings for Flywheel Systems," (PI: P. Allaire), amount $38,000 ($12,000), RDC, Inc., Jan. 1997–June 1997.

65. "Energy Momentum Flywheels for Satellites: Theoretical and Experimental Investigation of Gain-Scheduled Controllers," (PI: P. Allaire), amount $600,000 ($110,000), AFS, Inc., (NASA SBIR – Phase II), Feb. 1998–Jan. 2000.

66. "Integrated Lab Project," amount $30,000 ($10,000), (Co-PIs: J. Seitzman and J. Craig), GTF, July 1999–September 2000.

67. "Gain-Scheduled Control of Magnetic Bearing Milling Spindles," (PI: C. Knospe), amount $250,000 ($100,000), NSF, Nov. 1997-Oct. 2000.

68. "NIA: Experimental Validation of Advanced Nonlinear Concepts in Spacecraft Control," (PI: D. Schrage), amount $500,000, ($20,000), NIA/NASA LaRC, June 2004–May 2005.

69. "Prototype Controller for Elastic Spacecraft ," (PI: W. Singhose) amount $69,000 ($10,000), Northop-Grumman, Dec. 2003–May 2005.

---

[1]The amount in parenthesis shows level of responsibility.

70. "Flight Algorithms for Nocturnal Atmospheric Wind Energy Extraction," (PI: M. Costello), amount $100,950 ($50,000), DARPA (Subcontract from Simpson Weather Associates), Nov. 2008-Mar. 2009.

71. "Rapid Reconnaissance and Response ($R^3$) Mission," (PI: D. Spencer), amount $110,000, AFOSR (University NanoSat Program), Jan. 2009–Dec. 2010.

72. "Satellite Tracking Station and Mission Operations Center," (Co-PIs: R. Russell and D. Spencer), Technology Fee Funds, College of Engineering, Georgia Institute of Technology, amount $100,000, Jan. 2009-June. 2009.

73. "Motion Coordination and Adaptation Using Deception and Human Interactions," (PI: M. Egerstedt), amount $620,000 ($320,000), AFOSR, Jan. 2013–Dec. 2015.

74. "Learning Optimal Control using Forward-Backward SDEs," (PI: E. Theodorou), amount $350,000 ($157,500), NSF/CMMI, June 2017–May 2020.

75. "ARCHES: Autonomous Resilient Cognitive Heterogeneous Swarms," (PI: M. Egerstedt), ARL/UPenn, $9,600,000 ($2,423,000), Nov. 2017–Oct. 2027.

76. "Verification and Validation of Algorithms for Resilient Complex Software Controlled Systems," (PI: E. Feron), Verus Research $60,000 ($20,000), Mar. 2018-Dec. 2018.

77. "RAIDER: Resilient Actionable Intelligence for Distributed Environment understanding and Reasoning," (PI: J. Cortes, UCSD), ONR, $2,000,000 ($500,000), Aug. 2018–July 2022.

78. "Curiosity Lab at Peachtree Corners," (PI: Debra Lam), City of Peachtree Corners, $100,000, May 2019–April 2020.

79. "Safe Aviation Autonomy with Learning-enabled Components in the Loop: From Formal Assurances to Trusted Recovery Methods," NASA ULI, (PI: M. Pavone, Stanford), $8,000,0000 ($600,000), Sep. 2020–Aug. 2024.

80. "Safe, Fluent, and Generalizable Outdoor Autonomy," ARL, (PI: B. Boots, Univ. of Washington), $750,000 ($87,000), April 2020–Dec. 2020.

## VII. Honors, Awards and Recognition

Awards and Recognition

American Astronautical Society (AAS), Fellow, 2019

Institute of Electrical and Electronics Engineers (IEEE), Fellow, 2019

IEEE Award for Technical Excellence in Aerospace Control
    IEEE Control Systems Society, 2018

Best student paper award 1st place (advisor of Jack Ridderhof)
    AIAA SciTech, San Diego, 2019

Best student paper award finalist (advisor of Kazuhide Okamoto)
    IEEE Conference on Systems, Man and Cybernetics, Budapest, Hungary, 2016

Sigma Xi Best PhD Thesis Award (advisor of Nuno Filipe)
    Sigma Xi Society, Georgia Institute of Technology, 2015

Purdue University 2014 School of Aeronautics and Astronautics' Outstanding Aerospace Engineer (OAE) award (highest honor bestowed on that school's alumni)

Best student paper award 1st place (advisor of Nuno Filipe)
    AIAA Guidance, Navigation and Control Conference, Boston, 2013

Appointed College of Engineering Dean's Professor
    College of Engineering, Georgia Institute of Technology, 2012

Sigma Xi Best Undergraduate Research Award (advisor of Luis Reyes Castro)
Sigma Xi Society, Georgia Institute of Technology, 2011

Best conference paper award <u>finalist</u>
10th Symposium on Distributed Autonomous Robotic Systems (DARS), Lausanne, Switzerland, 2010

American Institute of Aeronautics and Astronautics (AIAA), Fellow, 2009

Best student paper award <u>1st place</u> (advisor of Raghvendra Cowlagi)
American Control Conference, St. Louis, Missouri, 2009

Luther Long Award, 2006
for <u>best doctoral thesis</u> at Georgia Tech in the area of Engineering Mechanics (advisor of E. Velenis)

<u>Top Ten Best Paper list</u>, AIAA Paper 03-5654
AIAA Guidance, Navigation and Control Conference, Austin, 2003

Tibetts Award for Outstanding Research (leading member of SBIR team)
NASA Goddard Space Flight Center, Technology Commercialization Office, 1999

Faculty Early Career Development (CAREER) Award
National Science Foundation, 1996

Sigma Xi President and Visitors' Award for Excellence in Research
Sigma Xi Society, University of Virginia, 1996

Teaching Fellow, 1998-1999
Georgia Institute of Technology

Best Student Paper, <u>2nd place</u> (advisor of Ancil Marshall)
AIAA Southeastern Region Student Conference, Savannah, Georgia, 1999

Best student paper award, <u>finalist</u> (advisor of Jihao Luo)
American Control Conference, Philadelphia, Pennsylvania, 1998

Best student paper award, <u>finalist</u> (advisor of Jihao Luo)
American Control Conference, Albuquerque, New Mexico, 1997

Top Ten Best paper list, AIAA Paper 96-3791
AIAA Guidance, Navigation and Control Conference, San Diego, 1996

Outstanding International Community Student Award
Purdue Student Government, 1992

Scholarships and Fellowships

Scholarship to attend Summer School in Control Theory
Centre de Recherches Mathématiques, Université de Montréal, 1992

Fellowship for Doctoral Studies
Bakala Institute, Athens, Greece, 1992

David Ross Research Fellowship
Purdue University, 1989-1991

NATO Research Fellowship for Doctoral Studies
Greek State, 1989-1992

Yearly Fellowship for Academic Excellence
Greek National Fellowship Institute, 1981-1986

Honor Societies

Phi Kappa Phi, Honor Society
Tau Beta Pi, Engineering Honor Society
Sigma Gamma Tau, Aerospace Engineering Honor Society