

Soon-Jo Chung, Sc.D.

Bren Professor of Aerospace, California Institute of Technology

<http://aerospacerobotics.caltech.edu>

1. Education

1. MIT, Doctor of Science (Sc.D.) in Estimation and Control, Minor in Optics, June 2007.
Thesis supervisor: David W. Miller and Co-advisor: Jean-Jacques E. Slotine
2. MIT, Master of Science (S.M.) in Aeronautics and Astronautics, September 2002.
Thesis advisor: David W. Miller
3. Korea Advanced Institute of Science and Technology (KAIST), Bachelor of Science (B.S.) in Aerospace Engineering, *Summa Cum Laude*, Rank 1/120, Feb. 1998.

2. Primary Academic Positions

1. Bren Professor of Aerospace, California Institute of Technology, 2/2019-Present
2. Professor of Aerospace, California Institute of Technology, 12/2018-Present
3. Research Scientist, Caltech Jet Propulsion Laboratory, 12/2016- Present
4. Associate Professor of Aerospace and Bren Scholar, California Institute of Technology, 8/2016-12/2018
5. Associate Professor, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, 8/16/2015-8/21/2016, Adjunct Associate Professor (8/2016-present)
6. Assistant Professor, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, 8/1/2009-8/15/2015
7. Assistant Professor, Department of Aerospace Engineering, Iowa State University, 7/1/2007-7/31/2009

3. Other Academic and Industry Positions

1. Affiliated Faculty in Control and Dynamical Systems (CDS), Computing + Mathematical Sciences (CMS), California Institute of Technology, 10/2016-Present
2. Associate Professor, Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, 8/16/2015-8/2016
3. Beckman Fellow, Center for Advanced Study, University of Illinois at Urbana-Champaign, 2014-2015
4. Member of Guidance & Control Analysis Group as JPL Summer Faculty Research Fellow (6/2010-8/2010, 6/2011-8/2011, 6/2013-8/2013) and Faculty Affiliate (7/2012-8/2012, 6/2014-8/2014), Caltech/NASA Jet Propulsion Laboratory
5. Assistant Professor, Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, 1/1/2012-8/15/2015
6. Courtesy Assistant Professor, Department of Electrical and Computer Engineering, Iowa State University, 2008-7/31/2009
7. Engineering Consultant, Nightsky Systems, Raleigh, NC: Sub-contractor, NASA Goddard Space Flight Center (GSFC) Lunar Reconnaissance Orbiter (LRO), (4/07-9/07)
8. Graduate Research Assistant, MIT Space Systems Laboratory, Cambridge, MA, (9/2000-8/2002) and (2/2003-4/2007)
9. Full-time Software Development Consultant, Mide Technology Corporation, Medford, MA: Integrated Modeling software for NASA's future stellar interferometry missions. NASA SBIR Phase II, (6/04-8/04)

10. Research Engineer, National Optical Astronomical Observatory (NOAO), Tucson, AZ: Giant Segmented Mirror Telescope (GSMIT) project at the New Initiative Office (NIO)-NOAO, (9/02-01/03)
11. Head Teaching Assistant, MIT Aero/Astro Space Systems CDIO (Conceive-Design-Implement-Operate) Product Development Courses, (Spring 2001, Fall 2001, Spring 2002)
12. Mandatory military service as a Korean Augmentation To the US Army (KATUSA), Translator and Administration, 2nd Infantry Division, 8th US Army, (4/1998-6/2000)
13. Research Intern, Korea Aerospace Research Institute (KARI), Daejeon, South Korea, Winter 1997

4. Honors, Awards, and Professional Recognition

a. Research Honors, Awards, and Recognition (Major Honors in Bold)

- **Bren Professor, Named Professorship, Caltech**, 2019
- **Caltech Bren Scholar**, 2016
- **Best Student Paper Award** (as co-author and advisor), K. Matsuka, E. Sorina Lupu, Y. K. Nakka, R. Foust, S.-J. Chung, and F. Hadaegh, “Distributed Multi-Target Relative Pose Estimation for Cooperative Spacecraft Swarm,” Proc. 10th International Workshop on Satellite Constellations and Formation Flying (IWSCFF), Glasgow, United Kingdom, July 16-19, 2019.
- **AIAA Best Paper Award**, 2015 AIAA Guidance, Navigation, and Control (GNC) Conference, 2015: D. Morgan, S.-J. Chung, and F. Y. Hadaegh, “Swarm Assignment and Trajectory Optimization Using Variable-Swarm, Distributed Auction Assignment and Model Predictive Control.”
- **Arnold Beckman Fellow**, University of Illinois Center for Advanced Study (CAS), 2014
- **Dean’s Award for Excellence in Research**, College of Engineering, University of Illinois, 2014
- **NSF Faculty Early Career Development (CAREER) Award**, 2013
- **AIAA Best Paper Award**, 2009 AIAA Infotech at Aerospace and Unmanned Unlimited Conference, 2010: S.-J. Chung, J. Stoner, and M. Dorothy, “Neurobiologically Inspired Control of Engineered Flapping Flight.”
- **AFOSR Young Investigator Program (YIP) Award**, 2009
- **IEEE Best Paper Award**, IEEE International Conference on Electro-Information Technology, 2008. K. Celik, S.-J. Chung, and A. Somani, “Mono-Vision Corner SLAM for Indoor Navigation.”
- Invited Participant/Speaker, the National Academy of Engineering’s 2018 US Frontiers of Engineering Symposium, September 2018
- One of [10 most notable moments of Caltech in 2018](#): Drones Taught to Herd Birds Away From Airports
- Cover picture, (Bat Bot), Fall 2017 issue of Caltech Magazine, 2017
- 17 for 2017: The Year in News at Caltech: A Robot Drone That Mimics Bat Flight. The first (cover page) of [17 most notable moments and research news at Caltech from 2017](#)
- Invited Participant/Speaker, 5th Arab-American Frontiers of Science, Engineering, and Medicine Symposium by the National Academy of Sciences (NAS) and the National Academy of Engineering (NAE), 2017
- NASA Jet Propulsion Laboratory Summer Faculty Research Fellowship (3 times), 2013, 2010, 2011
- One of Four Best Student Paper Finalists (as advisor, student: Saptarshi Bandyopadhyay), 2014 IEEE Multi-Conference on Systems and Control
- Innovator by Crain's Chicago Business (May 28, 2012), 2012
- Co-Author of one of the most highly cited papers (top 1%) in the field worldwide (Elsevier Scopus), Council of Canadian Academies, 2011

b. Teaching Honors, Awards, and Recognition

- List of Teachers Ranked as Excellent, AE 202 Aerospace Flight Mechanics, UIUC, Fall 2013
- Faculty Advisor to 3rd place in the 2012/2014 NASA Lunarrobotics Mining Competition, 2012, 2014
- Faculty Advisor to 1st Place Winner, 2010/2011 AIAA Undergraduate Team Space Design Competition, 2011
- Outstanding Faculty Award, College of Engineering, VEISHA Annual Celebration, Iowa State, 2009
- Most Inspiring Professor of the Year Award, Aerospace Engineering, Iowa State, 2008, 2009

c. Academic Honors, Awards, and Recognition

- AT&T Foundation Asia/Pacific Leadership Award, 2000
- Summa Cum Laude, KAIST, 1998
- KAIST Action Committee Presidential Award, 4th Ranked University-Wide Honor, 1998
- Ranked 1/120, School of Mechanical, Aerospace, Nuclear Engineering, Class of 1998, KAIST, 1998
- Rotary International Scholarship, 1997
- KAIST Studying Abroad Scholarship to RMIT, Australia, 1996
- Academic Excellence Recognition (GPA higher than 4.0/4.3) for four years (KAIST), 1994-1997
- Highest GPA Recognition, KAIST (Semester GPA 4.3/4.3), Spring 1996

d. Service Awards

- Letter of Commendation for Exceptional Reviewing, AIAA Journal of Guidance, Control, and Dynamics (two times), 2006, 2010
- US Army Commendation Medal (ARCOM), 2000, for military service in the 2nd Infantry Division of the US Army, Korean Augmentation To the United States Army (KATUSA)-1998-2000.

5. Editorial Boards and Professional Societies

1. **Associate Editor**, IEEE Transactions on Automatic Control, since November 2019.
2. **Lead Guest Editor** of Special Issue on Aerial Swarm Robotics, IEEE Transactions on Robotics, 2017-2018
3. **Associate Editor**, IEEE Transactions on Robotics since January 2017.
4. **Associate Editor**, Journal of Guidance, Control, and Dynamics (AIAA) since December 2014.
5. **Associate Editor**, Space Robotics, Frontiers in Robotics and AI and Frontiers in Astronomy and Space Sciences
6. Associate Editor, Proceedings of the 2016 IEEE International Conference on Robotics and Automation (ICRA 2016), Stockholm, Sweden, May 16 - 21, 2016
7. Associate Editor, Proceedings of the 2015 IEEE International Conference on Robotics and Automation (ICRA 2015), Seattle, Washington, May 26 - 30, 2015
8. Associate Editor, Proceedings of the 2014 IEEE International Conference on Robotics and Automation (ICRA 2014), Hong Kong, China, May 31 - June 5, 2014.
9. Associate Editor, Proceedings of the 2013 IEEE International Conference on Robotics and Automation (ICRA 2013), Karlsruhe, Germany on May 6 - 10, 2013.

Conferences/Workshop Organized

1. **Co-Organizer/Co-Lead**, Large Constellations and Formations for Exploring Interstellar Objects and Long-Period Comets, Keck Institute for Space Studies (KISS), October 29-November 2, 2018

2. **Area Co-Chair**, 2017 NASA/ESA Conference on Adaptive Hardware and Systems (AHS 2017), July 24 – 27, 2017, California Institute of Technology, Pasadena, CA.
3. **Technical Program Committee Member**, 2017 *American Control Conference (ACC)*, May 24–26, Seattle, WA.
4. **Co-Organizer of Invited Sessions**, Advances in Guidance and Control of Unmanned Air Vehicles (with N. Hovakimyan), 2016 *ALAA Guidance, Navigation, and Control Conference*, San Diego, CA, 4-8 January, 2016
5. Chair, 2015 SciTech, Best Intelligent System Student Paper Competition; 2015 *ALAA Infotech at Aerospace Conference*, Kissimmee, FL, 5-9 January, 2015
6. **Program Committee Member**, *Robotics: Science and Systems Conference (RSS)*, Rome, Italy, July 2015
7. Planning Committee Member (Representing UIUC), 1st Aviation Innovation Conference in Urbana-Champaign (November 14, 2014)
8. **Co-Organizer of Invited Sessions**, Advances in UAS Technologies I & II (with N. Hovakimyan), 2015 *ALAA Guidance, Navigation, and Control Conference*, AIAA SciTech, Kissimmee, FL, 5-9 January, 2015
9. **Co-Organizer of Invited Sessions**, Advances in GN&C of Multi-Agent Autonomous Systems (with N. Hovakimyan), 2015 *ALAA Guidance, Navigation, and Control Conference*, Kissimmee, FL, 5-9 January, 2015
10. **International Program Committee (IPC) Member**, 2014 *IEEE Conference on Control Applications (CCA)* of the IEEE Multi-Conference on Systems and Control (Oct. 8-10, 2014, in Antibes/Nice in France)
11. Session Chair, AIAA Guidance, Navigation, and Control Conference, August 2013
12. **Workshop Co-Organizer**, Integration of Mechanics, Sensing, Actuation and Control in Biological and Bio-inspired Locomotion, *Robotics: Science and Systems Conference (RSS)*, Sydney, Australia, July 2012
13. **Program Committee Member**, *Robotics: Science and Systems Conference (RSS)*, Sydney, Australia, July 2012
14. **Conference Technical Area Co-Chair**, Intelligent Control in Aerospace Applications, *ALAA Guidance, Navigation, and Control (GNC) Conference*, 2012
15. **Program Committee Member**, *Robotics: Science and Systems Conference (RSS)*, Los Angeles, CA, 2011
16. **Conference Technical Area Chair**, Control Theory, Design, and Analysis Area, *ALAA Guidance, Navigation, and Control (GNC) Conference*, 2011
17. **Conference Technical Area Co-Chair**, Three Areas: Intelligent Systems, Aerospace Robotics, and Adaptive Systems, *ALAA Infotech @ Aerospace Conference*, Saint Louis, MO, 2011
18. **Invited Session Co-Organizer and Co-Chair**, Cooperative Control of Networked Nonlinear Dynamical Systems, *IEEE Conference on Decision and Control (CDC)*, Atlanta, Georgia, December 2010
19. **Conference Technical Area Co-Chair**, Control Theory, Design, and Analysis Area, *ALAA Guidance, Navigation, and Control (GNC) Conference*, 2010, Toronto, Canada
20. **Invited Session Organizer and Chair**: Bio-Inspired Flight Mechanics and Control of MAVs, *ALAA Atmospheric Flight Mechanics Conference (AFM)*, Toronto, Canada, August 2010
21. **Invited Session Organizer and Chair**: Bio-Inspired Control and Navigation for MAVs (**1st in Aerospace Community**), *ALAA Infotech @ Aerospace and Unmanned Unlimited Conference and Exhibit*, Seattle, WA, April 2009

Professional Society Membership

1. Elected Member, AIAA Guidance, Navigation, and Control Technical Committee, 2020-present
2. Founding Faculty Advisor to AIAA Student Chapter at Caltech, 2020-present
3. Elected Member, IEEE Control System Society (CSS) Technical Committee on Aerospace Controls
4. Elected Member, AIAA Intelligent Systems Technical Committee (ISTC) 2010-2014
5. Associate Member, AIAA Guidance, Navigation, and Control Technical Committee (GNC TC) 2008-2011
6. Member, IEEE Robotics and Automation Society

7. Member, IEEE Control Systems Society
8. Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
9. Senior Member, American Institute of Aeronautics and Astronautics (AIAA)

6. Courses Taught (with # of students)

Caltech

1. 2020S, Ae103b Aerospace Control Systems
2. 2020W, CDS112 Optimal Control and Estimation (Ae103a Aerospace Control Systems)
3. 2019S, CDS270/Ae240 Control and Estimation for Swarm Autonomy
4. 2019W, CDS112 Optimal Control and Estimation (Ae103a Aerospace Control Systems)
5. 2018F, 2019W, 2019S, Ae105abc Aerospace Engineering (Course Organizer and co-Instructor)
6. 2018S, Ae103c, Dynamics and Control of Aircraft and Spacecraft (5)
7. 2018W, Ae103b, Dynamics and Control of Aircraft and Spacecraft (11)
8. 2017S, Ae103a, Dynamics and Control of Aircraft and Spacecraft (14)

University of Illinois at Urbana-Champaign

9. 2015S, AE403, Spacecraft Attitude Control (20)
10. 2014S, AE598SJC, Advanced Flight Control for Aircraft and Spacecraft Systems (6)
11. 2013F, AE199SAB Undergraduate Open Seminar (Student Aircraft Builders) (27)
12. 2013F, AE199IRS Undergraduate Open Seminar (Illinois Robotics in Space) (15)
13. 2012S, AE598DSC, Distributed Control (5)
14. 2012F, AE504, Optimal Aerospace Systems (6)
15. 2011F, 2013S, 2013F AE202, Aerospace Flight Mechanics (36, 52, 41)
16. 2011S, AE441S, Aerospace Systems Design II, 36 (produced 1st Place Team, AIAA Undergraduate Team Space Design Competition)
17. 2010F, AE440S Aerospace Systems Design I, (36); produced 1st Place Team, AIAA Undergraduate Team Space Design Competition;
18. 2010S, 2016S AE353 Aerospace Control Systems (86, 120)
19. 2009F, AE454 System Dynamics and Control (14)

Iowa State University

20. 2009S, AerE531 Automatic Control of Flight Vehicles (10)
21. 2008F, AerE331 Flight Control Systems (90)
22. 2007F, 2008S AerE355 Aircraft Flight Dynamics and Control (82, 55)

Course Development at Caltech (for 1st year graduate students)

1. Ae 240/CDS270 Control and Estimation for Swarm Autonomy. 9 units (3-0-6); Prerequisites: CDS 112 (or Ae103a) and CDS 232, or permission of instructor. Various control and estimation tools for analysis and design of distributed autonomous robots and cooperative control of aerospace vehicles. Input-output stability tools including passivity and contraction theory. Synchronization and consensus theory for networked nonlinear systems. Learning, optimal control, and estimation for distributed autonomous agents.
2. Ae 103a. Optimal Control and Estimation. 9 units (3-0-6); first term. Prerequisites: CDS 110 (or equivalent). Optimization-based design of control systems, including optimal control and receding horizon control. Introductory random processes and optimal estimation. Kalman filtering and nonlinear filtering methods for autonomous systems.

3. Ae 103b. Dynamics and Control of Aircraft and Spacecraft. 9 units (3-0-6); second term. Prerequisites: Ae103a or permission of instructor. Advanced astrodynamics, flight mechanics, and attitude dynamics. Guidance, navigation, and control of autonomous aerospace vehicles.
4. Ae 103c. Dynamics and Control of Aircraft and Spacecraft. 9 units (1-0-8); third term. Prerequisites: Ae103a, Ae103b, or permission of instructor. Advanced topics in aerospace autonomy and guidance, navigation, and control.
5. Revision of Ae 105abc. Aerospace Engineering since Fall 2018. Revamping the course organization and project as the main course organizer.

Courses Developed at UIUC

4. AE598SJC Advanced Flight Control for Aircraft and Spacecraft Systems
Advanced Spacecraft and Aircraft Dynamics and Nonlinear/ Linear Control Theory for Flight Control Systems. Review of Aircraft Flight Dynamics and Relative Spacecraft Motions for Formation Flying and Proximity Operations such as Rendezvous and Docking; Vertical Take-off and Landing (VTOL) Flight Dynamics including Helicopters and Quadcopters.
5. AE598DSC Distributed Control (Spring 2012). Developed a graduate level control theory course. Overview of methods for analyzing stability and performance of interconnected linear and nonlinear systems, along with design methods. Input/Output Tools, Lyapunov/State-Space methods, and Optimization tools for control design.

7. Publications

a. Books Edited or Co-Edited

1. **S.-J. Chung**, A. A. Paranjape, P. Dames, S. Shen, and V. Kumar, Special Section on Aerial Swarm Robotics, *IEEE Transactions on Robotics*, with Guest Editorial Special Section on Aerial Swarm Robotics, vol. 34, no. 4, August 2018, pp. 835 – 836.

b. Chapters in Books

1. F. Y. Hadaegh, A. Johnson, D. S. Bayard, B. Acikmese, **S.-J. Chung**, and R. Mehra, “New Guidance, Navigation, and Control Technologies for Formation Flying Spacecraft and Planetary Landing,” *Advances in Control System Technology for Aerospace Applications*, Eric Feron (Ed.), Aerospace Decision and Control, Lecture Notes in Control and Information Sciences (LNCIS), Springer, 2016, pages 49-80. ISBN: 978-3-662-47693-2 (Print) 978-3-662-47694-9 (Online) **(invited article)**
2. V. V. Kulkarni, A. A. Paranjape, and **S.-J. Chung**, “Robust Tunable Transcriptional Oscillators using Dynamic Inversion,” *A Systems Theoretic Approach to Systems and Synthetic Biology I: Models and System Characterizations*, V. Kulkarni, Vishwesh, G.-B. Stan, K. Raman (Eds.), Springer, 2014, pages 103-119. DOI:10.1007/978-94-017-9041-3_4.
3. M. Dorothy, A. A. Paranjape, P. D. Kuang, and **S.-J. Chung**, “Towards Bio-inspired Robotic Aircraft: CPG-based Control of Flapping and Gliding Flight,” *Advances in Intelligent and Autonomous Aerospace Systems*, Chapter 1, John Valasek (Ed.), Progress in Astronautics and Aeronautics, American Institute of Aeronautics and Astronautics (AIAA), Reston, VA, 2012, pages 1-31. ISBN: 978-1-60086-897-9.
4. F. Y. Hadaegh, B. Acikmese, D. S. Bayard, G. Singh, M. Mandic, **S.-J. Chung**, and D. Morgan, “Guidance and Control of Formation Flying Spacecraft: From Two to Thousands,” in *Adventures on the Interface of Mechanics and Control*, Edited by K. Alfriend, et al., Tech Science Press, 2012, pages 327-371. **(invited article)**

c. Journal Articles

49. Y. K. Nakka, A. Liu, G. Shi, A Anandkumar, Y. Yue, and **S.-J. Chung**, “Chance-Constrained Trajectory Optimization for Safe Exploration and Learning of Nonlinear Systems,” *IEEE Robotics and Automation Letters*, under review, 2020.
48. H. Tsukamoto and **S.-J. Chung**, “Neural Contraction Metrics for Robust Estimation and Control: A Convex Optimization Approach,” *IEEE Control Systems Letters*, under review, 2020.
47. S. Han and **S.-J. Chung**, “Incremental Nonlinear Stability Analysis for Stochastic Systems Perturbed by Levy Noise,” *IEEE Transactions on Automatic Control*, under review, 2020.
46. K. Matsuka, A. O. Feldmana, E. S. Lupua, **S.-J. Chung**, and F. Y. Hadaegh, “Decentralized Formation Pose Estimation for Spacecraft Swarms,” *Advances in Space Research*, to appear, 2020.
45. V. Capuano, A. Harvard, Y. Lin, and **S.-J. Chung**, “DGNS-Vision Integration for Robust and Accurate Relative Spacecraft Navigation,” *Navigation*, under revision, 2020.
44. B. Riviere and **S.-J. Chung**, “H-TD2: Hybrid Temporal Difference Learning for Online Optimal Urban Taxi Dispatch,” *IEEE Transactions on Intelligent Transportation Systems*, under review, 2019
43. H. Tsukamoto and **S.-J. Chung**, “Robust Controller Design for Stochastic Nonlinear Systems via Convex Optimization,” *IEEE Transactions on Automatic Control*, under review, 2019.
42. K. Meier, **S.-J. Chung**, and S. Hutchinson, “River segmentation for autonomous surface vehicle localization and river boundary mapping,” revision under review, 2020.
41. B. Rivière, W. Hoenig, Y. Yue, and **S.-J. Chung**, “GLAS: Global-to-Local Safe Autonomy Synthesis for Multi-Robot Motion Planning with End-to-End Learning,” *IEEE Robotics and Automation Letters*, to appear, 2020.
40. R. C. Foust, E. S. Lupu, Y. K. Nakka, **S.-J. Chung**, and F. Y. Hadaegh, “Autonomous In-Orbit Satellite Assembly from a Modular Heterogeneous Swarm,” *Acta Astronautica*, Volume 169, April 2020, pp. 191-205.
39. R. C. Foust, **S.-J. Chung**, and F. Y. Hadaegh, “Optimal Guidance and Control with Nonlinear Dynamics Using Sequential Convex Programming,” *Journal of Guidance, Control, and Dynamics*, to appear, 2019. <https://doi.org/10.2514/1.G004590>
38. V. Capuano, K. Kim, A. Harvard, and **S.-J. Chung**, “Monocular-Based Pose Determination of Uncooperative Space Objects,” *Acta Astronautica*, vol. 166, January 2020, pp. 493-506. [\(PDF\)](#)
37. Y. K. Nakka, **S.-J. Chung**, J. T. Allison, J. B. Aldrich, and O. S. Alvarez-Salazar, “Nonlinear Attitude Control of a Spacecraft with Distributed Actuation of Solar Arrays,” *Journal of Guidance, Control, and Dynamics*, vol. 42, no. 3, March 2019, pp. 458-475. [\(PDF\)](#)
36. **S.-J. Chung**, A. A Paranjape, P. Dames, S. Shen, and V. Kumar, “Guest Editorial Special Section on Aerial Swarm Robotics,” *IEEE Transactions on Robotics*, vol. 34, no. 4, August 2018, pp. 835-836.
35. **S.-J. Chung**, A. A Paranjape, P. Dames, S. Shen, and V. Kumar, “A Survey on Aerial Swarm Robotics,” *IEEE Transactions on Robotics*, vol. 34, no. 4, 2018, pp. 837-855. [\(PDF\)](#)
34. S. Bandyopadhyay and **S.-J. Chung**, “Distributed Bayesian Filtering Algorithm for Dynamic Sensor Networks,” *Automatica*, vol. 97, November 2018, pp. 7-17. [\(PDF\)](#)
33. A. A. Paranjape, **S.-J. Chung**, K. Kim, and D. H. Shim, “Robotic Herding of a Flock of Birds Using an Unmanned Aerial Vehicle,” *IEEE Transactions on Robotics*, vol. 34, no. 4, 2018, pp. 901-915. [\(PDF\)](#)
32. J. Hoff, A. Ramezani, **S.-J. Chung**, and S. Hutchinson, “Optimizing the Structure and Movement of a Robotic Bat with Biological Kinematic Synergies,” *The International Journal of Robotics Research*, vol. 37, no. 10, 2018, pp. 1233-1252. [\(PDF\)](#)
31. A. A. Paranjape and **S.-J. Chung**, “Robust Adaptive Boundary Control of Semilinear PDE Systems Using a Dyadic Controller,” *International Journal of Robust and Nonlinear Control*, vol. 28, no. 8, 2018, pp. 3174-3188. [\(PDF\)](#)
30. M. Miller, **S.-J. Chung**, and S. Hutchinson, “The Visual-Inertial Canoe Dataset,” *The International Journal of Robotics Research*, vol. 37, no. 1, 2018, pp. 13-20. [\(PDF\)](#)
29. K. Meier, **S.-J. Chung**, and S. Hutchinson, “Visual-Inertial Curve Simultaneous Localization and Mapping: Creating a Sparse Structured World without Feature Points,” *Journal of Field Robotics*, vol. 35, no. 4, 2018, pp. 516-544. [\(PDF\)](#)

28. C. Chilan, D. R. Herber, Y. K. Nakka, J. T. Allison, **S.-J. Chung**, J. B. Aldrich, and O. S. Alvarez-Salazar, "Co-Design of Strain-Actuated Solar Arrays for Spacecraft Precision Pointing and Jitter Reduction," *ALAA Journal*, vol. 55, no. 9, 2017, pp. 3180-3195. [\(PDF\)](#)
27. A. Ramezani, **S.-J. Chung**, and S. Hutchinson, "A Biomimetic Robotic Platform to Study Flight Specializations of Bats," *Science Robotics (AAAS)*, vol. 2, eaal2505, February 2017. **(Cover Article)** Highlighted in *Nature*, "A robot that flies like a bat," *Nature* 542, 140 (09 February 2017). [\(PDF\)](#)
26. S. Bandyopadhyay, **S.-J. Chung**, and F. Y. Hadaegh, "Probabilistic and Distributed Control of a Large-Scale Swarm of Autonomous Agents," *IEEE Transactions on Robotics*, vol. 33, no. 5, 2017, pp. 1103-1123. [\(PDF\)](#)
25. M. Dorothy and **S.-J. Chung**, "Switched Systems with Multiple Invariant Sets," *System & Control Letters*, vol. 96, October 2016, pp. 103-109. [\(PDF\)](#)
24. D. Morgan, G. P. Subramanian, **S.-J. Chung**, and F. Y. Hadaegh, "Swarm Assignment and Trajectory Optimization Using Variable-Swarm, Distributed Auction Assignment and Sequential Convex Programming," *The International Journal of Robotics Research*, vol. 35, no. 10, September 2016, pp. 1261-1285. **A preliminary version won 2015 AIAA GNC Best Paper Award.** [\(PDF\)](#)
23. S. Bandyopadhyay, **S.-J. Chung**, and F. Y. Hadaegh, "Nonlinear Attitude Control of Spacecraft with a Large Captured Object," *Journal of Guidance, Control, and Dynamics*, vol. 39, no. 4, 2016, pp. 754-769. [\(PDF\)](#)
22. S. Bandyopadhyay, R. Foust, G. P. Subramanian, **S.-J. Chung**, and F. Y. Hadaegh, "Review of Formation Flying and Constellation Missions Using Nanosatellites," *Journal of Spacecraft and Rockets*, vol. 53, no. 3, 2016, pp. 567-578. [\(PDF\)](#)
21. J. Yang, A. Dani, **S.-J. Chung**, and S. Hutchinson, "Vision-Based Localization and Robot-Centric Mapping in Riverine Environments," *Journal of Field Robotics*, vol. 34, no. 3, 2017, pp. 429-450. [\(PDF\)](#)
20. A. A. Paranjape, K. C. Meier, X. Shi, **S.-J. Chung**, and S. Hutchinson, "Motion Primitives and 3D Path Planning for Fast Flight through a Forest," *The International Journal of Robotics Research*, vol. 34, no. 3, March 2015, pp. 357-377. [\(PDF\)](#)
19. A. P. Dani, **S.-J. Chung**, and S. Hutchinson, "Observer Design for Stochastic Nonlinear Systems via Contraction-based Incremental Stability," *IEEE Transactions on Automatic Control*, vol. 60, no. 3, March 2015, pp. 700-714. [\(PDF\)](#)
18. J. Yu, **S.-J. Chung**, and P. G. Voulgaris, "Target Assignment in Robotic Networks: Distance Optimality Guarantees and Hierarchical Strategies," *IEEE Transactions on Automatic Control*, vol. 60, no. 2, February 2015, pp. 327-341. [\(PDF\)](#)
17. F. Y. Hadaegh, **S.-J. Chung**, and H. M. Manohara, "On Development of 100-Gram-Class Spacecraft for Swarm Applications," *IEEE Systems Journal*, vol. 10, no. 2, June 2016, pp. 673-684. [\(PDF\)](#)
16. D. Morgan, **S.-J. Chung**, and F. Y. Hadaegh, "Model Predictive Control of Swarms of Spacecraft Using Sequential Convex Programming," *Journal of Guidance, Control, and Dynamics*, vol. 37, no. 6, 2014, pp. 1725-1740. [\(PDF\)](#)
15. A. A. Paranjape, **S.-J. Chung**, and J. Kim, "Novel Dihedral-Based Control of Flapping-Wing Aircraft with Application to Perching," *IEEE Transactions on Robotics*, vol. 29, no. 5, October 2013, pp. 1071-1084. [\(PDF\)](#)
14. A. A. Paranjape, J. Guan, **S.-J. Chung**, and M. Krstic, "PDE Boundary Control for Flexible Articulated Wings on a Robotic Aircraft," *IEEE Transactions on Robotics*, vol. 29, no. 3, June 2013, pp. 625-640. [\(PDF\)](#)
13. **S.-J. Chung**, S. Bandyopadhyay, I. Chang, and F. Y. Hadaegh, "Phase Synchronization Control of Complex Networks of Lagrangian Systems on Adaptive Digraphs," *Automatica*, vol. 49, no. 5, May 2013, pp. 1148-1161. [\(PDF\)](#)
12. A. A. Paranjape, M. R. Dorothy, **S.-J. Chung**, and K. D. Lee, "A Flight Mechanics-Centric Review of Bird-Scale Flapping Flight," *International Journal of Aeronautical and Space Sciences*, vol. 13, no. 3, September 2012, pp. 267-282. *invited review article.* [\(PDF\)](#)
11. D. Morgan, **S.-J. Chung**, L. Blackmore, B. Acikmese, D. Bayard, and F. Y. Hadaegh, "Swarm-Keeping Strategies for Spacecraft under J2 and Atmospheric Drag Perturbations," *Journal of Guidance, Control, and Dynamics*, vol. 35, no. 5, September-October 2012, pp. 1492-1506. [\(PDF\)](#)

10. A. A. Paranjape, **S.-J. Chung**, H. H. Hilton, and A. Chakravarthy, "Dynamics and Performance of Tailless Micro Aerial Vehicle with Flexible Articulated Wings," *ALAA Journal*, vol. 50, no. 5, May 2012, pp. 1177-1188. [\(PDF\)](#)
9. A. A. Paranjape, **S.-J. Chung**, and M. S. Selig, "Flight Mechanics of a Tailless Articulated Wing Aircraft," *Bioinspiration & Biomimetics*, vol. 6, no. 2, 2011, 026005. **Highlighted as Lab Talk Article.** [\(PDF\)](#)
8. **S.-J. Chung** and M. Dorothy, "Neurobiologically Inspired Control of Engineered Flapping Flight," *Journal of Guidance, Control, and Dynamics*, vol. 33, no. 2, Mar.-Apr. 2010, pp. 440-453. The conference paper version won **AIAA Infotech@Aerospace Best Paper Award.** [\(PDF\)](#)
7. K. Seo, **S.-J. Chung**, and J.-J. E. Slotine, "CPG-based Control of a Turtle-like Underwater Vehicle," *Autonomous Robots*, Special Issue on Control of Locomotion: From Animals to Robots, vol. 28, no. 3, 2010, pp. 247-269. [\(PDF\)](#)
6. **S.-J. Chung** and J.-J. E. Slotine, "Cooperative Robot Control and Concurrent Synchronization of Lagrangian Systems," *IEEE Transactions on Robotics*, vol. 25, no. 3, June 2009, pp. 686-700. **Thomson-Reuters ESI Highly Cited Paper & Top Paper** [\(PDF\)](#)
5. **S.-J. Chung**, U. Ahsun, and J.-J. E. Slotine, "Application of Synchronization to Formation Flying Spacecraft: Lagrangian Approach," *Journal of Guidance, Control and Dynamics*, vol. 32, no. 2, Mar.-Apr. 2009, pp. 512-526. [\(PDF\)](#)
4. **S.-J. Chung**, J.-J. E. Slotine, and D. W. Miller, "Propellant-Free Control of Tethered Formation Flight, Part 2: Nonlinear Underactuated Control," *Journal of Guidance, Control, and Dynamics*, vol. 31, no. 5, September-October 2008, pp. 1437-1446. [\(PDF\)](#)
3. **S.-J. Chung**, and D. W. Miller, "Propellant-Free Control of Tethered Formation Flight, Part 1: Linear Control and Experimentation," *Journal of Guidance, Control, and Dynamics*, vol. 31, no. 3, May-June 2008, pp. 571-584. [\(PDF\)](#)
2. **S.-J. Chung**, J.-J. E. Slotine, and D. W. Miller, "Nonlinear Model Reduction and Decentralized Control of Tethered Formation Flight," *Journal of Guidance, Control and Dynamics*, vol. 30, no. 2, 2007, pp. 390-400. [\(PDF\)](#)
1. **S.-J. Chung**, D. W. Miller, and O. L. de Weck, "ARGOS Testbed: Study of Multidisciplinary Challenges of Future Spaceborne Interferometric Arrays," *Optical Engineering*, vol. 43, no. 9, September 2004, pp. 2156-2167. [\(PDF\)](#)

d. Articles in Conference Proceedings

112. X. Shi, P. Spieler, E. Tang, E. S. Lupu, P. Tokumaru, and S.-J. Chung, "Adaptive Nonlinear Control of Fixed-Wing VTOL with Airflow Vector Sensing," *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, 2020.
111. G. Shi, W. Hoenig, Y. Yue, and S.-J. Chung, "Neural-Swarm: Decentralized Close-Proximity Multirotor Control Using Learned Interactions," *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, Paris, France, 2020.
110. B. Bernhard, C. Choi, A. Rahmani, S.-J. Chung, and F. Hadaegh, "Coordinated Motion Planning for On-Orbit Satellite Inspection using a Swarm of Small-Spacecraft," *Proc. IEEE Aerospace Conference*, Big Sky, Montana, Mar. 7-14, 2020.
109. J. Villa, S. Bandyopadhyay, B. Morrell, B. Hockman, D. Lubey, A. Harvard, S.-J. Chung, S. Bhaskaran, and I. A. Nesnas, "Optical Navigation for Autonomous Approach of Unexplored Small Bodies," *Proc. 43rd Annual AAS Guidance, Navigation and Control Conference*, AAS 20-125.
108. A. Harvard, V. Capuano, E. Shao, and S.-J. Chung, "Spacecraft Pose Estimation from Monocular Images Using Neural Network Based Keypoints and Visibility Maps," *AIAA SciTech*, Orland, FL, January 6-10, 2020.
107. H. Tskumamoto and S.-J. Chung, "Optimal Tracking Control for Stochastic Nonlinear Systems using Contraction Analysis," *Proc. the 2019 IEEE Conference on Decision and Control (CDC)*, Nice, France, December 11-13, 2019.

106. Y. K. Nakka and S.-J. Chung, "Trajectory Optimization for Chance-Constrained Nonlinear Stochastic Systems," *Proc. the 2019 IEEE Conference on Decision and Control (CDC)*, Nice, France, December 11-13, 2019.
105. V. Capuano, A. Harvard, Y. Lin, and S.-J. Chung, "DGNSS-Vision Integration for Robust and Accurate Relative Spacecraft Navigation," *Proc. Institute of Navigation ION GNSS+*, Miami, Florida, Sep. 16-20, 2019.
104. K. Matsuka, E. Sorina Lupu, Y. K. Nakka, R. Foust, S.-J. Chung, and F. Hadaegh, "Distributed Multi-Target Relative Pose Estimation for Cooperative Spacecraft Swarm," *Proc. 10th International Workshop on Satellite Constellations and Formation Flying (IWSCFF)*, Glasgow, United Kingdom, July 16-19, 2019. **Best Student Paper Award.**
103. K. Cai, A. Harvard, R. M. Murray, and **S.-J. Chung**, "Robust Estimation Framework with Semantic Measurements," *Proc. American Control Conference (ACC)*, Philadelphia, PA, July 10-12, 2019.
102. G. Shi, X. Shi, M. O'Connell, R. Yu, K. Azizzadenesheli, A. Anandkumar, Y. Yue, and **S.-J. Chung**, "Neural Lander: Stable Drone Landing Control using Learned Dynamics," *Proc. 2019 IEEE International Conference on Robotics and Automation (ICRA)*, May 20-24, 2019, Montréal, Canada.
101. J. C. Castillo-Rogez, K. J. Meech, **S.-J. Chung**, and D. Landau, "Approach to Exploring Interstellar Objects and Long-Period Comets," *Proc. 29th AAS/ALAA Space Flight Mechanics Meeting*, January 13-17, 2019, AAS 19-436.
100. V. Capuano, S. R. Alimo, A. Q. Ho, and **S.-J. Chung**, "Robust Feature Extraction for On-board Monocular-based Spacecraft Pose Acquisition," *Proc. 2019 ALAA SciTech Forum*, San Diego, CA January 7-11, 2019.
99. K. Kim, S. Rahili, X. Shi, **S.-J. Chung**, and M. Gharib, "Controllability and Design of Unmanned Multirotor Aircraft Robust to Rotor Failure," *Proc. 2019 ALAA SciTech Forum*, San Diego, CA, January 7-11, 2019.
98. R. Foust, **S.-J. Chung**, and F. Y. Hadaegh, "Solving Optimal Control with Nonlinear Dynamics using Sequential Convex Programming," *Proc. ALAA Guidance, Navigation, and Control Conference*, San Diego, CA, January 7-11, 2019.
97. X. Shi, K. Kim, S. Rahili, and **S.-J. Chung**, "Nonlinear Control of Autonomous Flying Cars with Wings and Distributed Electric Propulsion," *Proc. the 2018 IEEE Conference on Decision and Control (CDC)*, Fontainebleau, Miami Beach, FL, Dec. 17-19, 2018.
96. S. Rahili, B. Riviere, S. Oliver, and **S.-J. Chung**, "Optimal Routing for Autonomous Taxis and Ridesharing: Distributed Reinforcement Learning Approach," *IEEE ICDM 2018 Workshops Proc. of 1st Workshop on Data-driven Intelligent Transportation (DIT 2018)*, Singapore, 17 November 2018.
95. F. Baldini, A. Harvard, **S.-J. Chung**, I. Nesnas, and S. Bhaskaran, "Autonomous Small Body Mapping and Spacecraft Navigation," *Proc. 69th International Astronautical Congress*, Bremen, Germany, 1 - 5 October 2018.
94. V. Capuano, K. Kim, J. Hu, A. Harvard, and **S.-J. Chung**, "Monocular-Based Pose Determination of Uncooperative Known and Unknown Space Objects," *Proc. 69th International Astronautical Congress*, Bremen, Germany, 1 - 5 October 2018.
93. R. C. Foust, E. S. Lupu, Y. K. Nakka, **S.-J. Chung**, and F. Y. Hadaegh, "Ultra-Soft Electromagnetic Docking with Applications to In-Orbit Assembly," *Proc. 69th International Astronautical Congress*, Bremen, Germany, 1-5 October 2018.
92. Y. K. Nakka, R. C. Foust, E. S. Lupu, D. B. Elliott, I. S. Crowell, **S.-J. Chung**, and F. Y. Hadaegh, "A Six Degree-Of-Freedom Spacecraft Dynamics Simulator for Formation Control Research," *the 2018 AAS/ALAA Astrodynamics Specialist Conference*, Snowbird, Utah, August 19-23, 2018.
91. R. C. Foust, M. Zhao, S. Oliver, **S.-J. Chung**, and F. Y. Hadaegh, F.Y., "Distributed Control of An Evolving Satellite Assembly During In-Orbit Construction," *International Astronautical Congress*, Adelaide, Australia, September 25-29, 2017.
90. S. Bandyopadhyay, F. Baldini, R. Foust, **S.-J. Chung**, A. Rahmani, J.-P. de la Croix, and F. Y. Hadaegh, "Distributed Spatiotemporal Motion Planning for Spacecraft Swarms in Cluttered Environments," *ALAA Space*, Orlando, Florida, Sep. 2017.

89. U. A. Syed, A. Ramezani, **S.-J. Chung**, and S. Hutchinson, "From Roussettus aegyptiacus (bat) Landing to Robotic Landing: Regulation of CG-CP Distance Using a Nonlinear Closed-Loop Feedback," *Proc. 2017 IEEE International Conference on Robotics and Automation (ICRA)*, Singapore, May 29 - June 3, 2017.
88. A. Ramezani, U. A. Syed, J. Hoff, **S.-J. Chung**, and S. Hutchinson, "Describing Robotic Bat Flight with Stable Periodic Orbits," *Living Machines VI: The 6th International Conference on Biomimetic and Biohybrid Systems*, Stanford University, July 25-28, 2017.
87. J. Hoff, A. Ramezani, **S.-J. Chung**, and S. Hutchinson, "Reducing Versatile Bat Wing Conformations to a 1-DoF Machine," *Living Machines VI: The 6th International Conference on Biomimetic and Biohybrid Systems*, Stanford University, July 25-28, 2017.
86. A. Goel, **S.-J. Chung**, and S. Pellegrino, "Trajectory Design of a Spacecraft Formation for Space-Based Solar Power Using Sequential Convex Programming," *Proc. 9th International Workshop on Satellite Constellations and Formation Flying (IWSCFF)*, Boulder, Colorado, June 19-21, 2017.
85. R. C. Foust, Y. K. Nakka, A. Saxena, **S.-J. Chung**, and F. Y. Hadaegh, "Automated Rendezvous and Docking Using Tethered Formation Flight," *Proc. 9th International Workshop on Satellite Constellations and Formation Flying (IWSCFF)*, Boulder, Colorado, June 19-21, 2017.
84. S. Bandyopadhyay, F. Baldini, R. Foust, **S.-J. Chung**, A. Rahmani, J.-P. de la Croix, and F. Y. Hadaegh, "Distributed Fast Motion Planning for Spacecraft Swarms in Cluttered Environments Using Spherical Expansions and Sequence of Convex Optimization Problems," *Proc. 9th International Workshop on Satellite Constellations and Formation Flying (IWSCFF)*, Boulder, Colorado, June 19-21, 2017.
83. A. A. Paranjape and **S.-J. Chung**, "Sub-Optimal Boundary Control of Semilinear PDEs using a Dyadic Perturbation Observer," *Proc. 55th IEEE Conference on Decision and Control (CDC)*, Las Vegas, NV, Dec. 2016.
82. K. Meier, **S.-J. Chung**, and S. Hutchinson, "Visual-Inertial Curve SLAM," *Proc. 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, October 9-14, 2016.
81. S. Bandyopadhyay, **S.-J. Chung**, and F. Y. Hadaegh, "A Probabilistic Eulerian Approach for Motion Planning of a Large-Scale Swarm of Robots," *Proc. 2016 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, October 9-14, 2016.
80. F. Baldini, R. Foust, A. Bacula, C. M. Chilan, **S.-J. Chung**, S. Bandyopadhyay, A. Rahmani, J.-P. de la Croix, and F. Y. Hadaegh, "Spacecraft Trajectory Planning using Spherical Expansion and Sequential Convex Programming," *ALAA/AAS Astrodynamics Specialist Conference, ALAA SPACE and Astronautics Forum and Exposition*, Long Beach, CA, 13-16 Sep 2016.
79. G. Falcone, A. Saxena, **S.-J. Chung**, S. Bandyopadhyay, G. Singh, A. San Martin, and F. Y. Hadaegh, "Attitude Control of Asteroid Redirect Mission Spacecraft with a Captured Boulder," *ALAA/AAS Astrodynamics Specialist Conference, ALAA SPACE and Astronautics Forum and Exposition*, Long Beach, CA, 13-16 Sep 2016.
78. R. Foust, **S.-J. Chung**, and F. Y. Hadaegh, "Autonomous In-Orbit Satellite Assembly from a Modular Heterogeneous Swarm using Sequential Convex Programming," *ALAA/AAS Astrodynamics Specialist Conference, ALAA SPACE and Astronautics Forum and Exposition*, Long Beach, CA, 13-16 Sep 2016.
77. J. Hoff, A. Ramezani, **S.-J. Chung**, and S. Hutchinson, "Synergistic Design of a Bio-Inspired Micro Aerial Vehicle with Articulated Wings," *The Robotics: Science and Systems Conference (RSS)*, Ann Arbor, Michigan, June 18-22, 2016.
76. A. Ramezani, X. Shi, **S.-J. Chung**, and S. Hutchinson, "Bat Bot (B2), A Biologically Inspired Flying Machine," *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, May 16-21, 2016. **(Acceptance rate: 34.7%)**
75. R. Foust, **S.-J. Chung**, and F. Y. Hadaegh, "Real-Time Optimal Control and Target Assignment for Autonomous In-Orbit Satellite Assembly from a Modular Heterogeneous Swarm," *26th AAS/ALAA Space Flight Mechanics Meeting*, Napa, California, February 14-18, 2016.
74. O. Alvarez-Salaza, J. Aldrich, N. Filipe, J. Allison, and **S.-J. Chung**, "Strain Actuated Solar-Arrays for Precision Pointing of Spacecraft," *AAS Guidance, Navigation, and Control Conference*, Breckenridge, Colorado, Feb. 2016. AAS 16-137.
73. C. M. Chilan, D. R. Herber, Y. K. Nakka, **S.-J. Chung**, J. T. Allison, J. B. Aldrich, and O. S. Alvarez-Salazar, "Co-Design of Strain-Actuated Solar Arrays for Precision Pointing and Jitter Reduction," *57th*

- AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, San Diego, CA, 4-8 Jan 2016, AIAA 2016-016.
72. A. Ramezani, X. Shi, **S.-J. Chung**, and S. Hutchinson, "Modeling and Nonlinear Flight Controller Synthesis of a Bat-Inspired Micro Aerial Vehicle," *AIAA Guidance, Navigation, and Control Conference*, San Diego, CA, 4-8 Jan 2016, AIAA 2016-1376.
 71. S. Gade, A. Paranjape, and **S.-J. Chung**, "Robotic Herding using Wavefront Algorithm: Performance and Stability," *AIAA Guidance, Navigation, and Control Conference*, San Diego, CA, 4-8 Jan 2016, AIAA 2016-1378.
 70. A. A. Paranjape and **S.-J. Chung**, "Output Feedback Stabilization of Linear PDEs with Finite Dimensional Input-Output Maps and Kelvin-Voigt Damping," *IEEE Conference on Decision and Control (CDC)*, Osaka, Japan, Dec. 15-18, 2015, pp. 578-583. **(Acceptance rate: 59.5%)**
 69. A. Ramezani, X. Shi, **S.-J. Chung**, and S. Hutchinson, "Lagrangian Modeling and Flight Control of Articulated-Winged Bat Robot," *Proc. 2015 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, September 28 - October 02, 2015. **(Acceptance rate: 46%)**
 68. S. Bandyopadhyay, **S.-J. Chung**, and F. Y. Hadaegh, "Feedback-Based Inhomogeneous Markov Chain Approach to Probabilistic Swarm Guidance," *8th International Workshop on Satellite Constellations and Formation Flying (IWSCFF)*, Delft, Netherlands, June 8-10, 2015.
 67. S. Bandyopadhyay and **S.-J. Chung**, "Nonlinear Attitude Control of Spacecraft with a Captured Asteroid," *8th International Workshop on Satellite Constellations and Formation Flying (IWSCFF)*, Delft, Netherlands, June 8-10, 2015.
 66. J. Yang, **S.-J. Chung**, S. Hutchinson, D. Johnson, M. Kise, "Omnidirectional-Vision-Based Estimation for Containment Detection of a Robotic Mower," *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, Washington, May 26-30, 2015. **(Acceptance rate: 41%)**
 65. S. Bandyopadhyay, **S.-J. Chung**, and F. Y. Hadaegh, "Attitude Control and Stabilization of Spacecraft with a Captured Asteroid," *AIAA Guidance, Navigation, and Control Conference*, Kissimmee, Florida, 5-9 Jan 2015, AIAA 2015-0596.
 64. D. Morgan, **S.-J. Chung**, and F. Y. Hadaegh, "Swarm Assignment and Trajectory Optimization Using Variable-Swarm, Distributed Auction Assignment and Model Predictive Control," *AIAA Guidance, Navigation, and Control Conference*, Kissimmee, Florida, 5-9 Jan 2015, AIAA 2015-0599. **Best Paper Award in the AIAA GNC Conference.**
 63. G. P. Subramanian, R. Foust, D. Chen, S. Chan, Y. Taleb, D. Rogers, J. Kokkat, S. Bandyopadhyay, D. Morgan, **S.-J. Chung**, and F. Y. Hadaegh, "Information-Driven Systems Engineering Study of a Formation Flying Demonstration Mission using Six CubeSats," *53rd AIAA Aerospace Sciences Meeting*, Kissimmee, Florida, 5-9 Jan 2015, AIAA 2015-2043.
 62. S. Bandyopadhyay, G. P. Subramanian, R. Foust, D. Morgan, S. Chan, **S.-J. Chung**, and F. Y. Hadaegh, "A Review of Impending Small Satellite Formation Flying Missions," *53rd AIAA Aerospace Sciences Meeting*, Kissimmee, Florida, 5-9 Jan 2015, AIAA 2015-1623.
 61. S. Gade, A. Paranjape, and **S.-J. Chung**, "Herding a Flock of Birds Approaching an Airport Using an Unmanned Aerial Vehicle," *AIAA Guidance, Navigation, and Control Conference*, Kissimmee, Florida, 5-9 Jan 2015, AIAA 2015-1540.
 60. A. A. Paranjape and **S.-J. Chung**, "Dyadic Perturbation Observer Framework for Control of a Class of Nonlinear PDE/ODE Systems," *Proc. 53rd IEEE Conference on Decision and Control (CDC)*, Los Angeles, CA, December 2014.
 59. S. Bandyopadhyay, **S.-J. Chung**, F. Y. Hadaegh, "Probabilistic Swarm Guidance using Optimal Transport," *2014 IEEE Conference on Control Applications (CCA), IEEE Multi-conference on Systems and Control (MSC)*, Antibes, France, Oct. 8-10, 2014. **Best Student Paper Finalist**
 58. D. Morgan, G. P. Subramanian, S. Bandyopadhyay, **S.-J. Chung**, F. Y. Hadaegh, "Probabilistic Guidance of Distributed Systems using Sequential Convex Programming," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Chicago, Illinois, Sept. 14-18, 2014, pp. 3850-3857. **(Acceptance rate: 47%)**
 57. S. Bandyopadhyay and **S.-J. Chung**, "Distributed Estimation using Bayesian Consensus Filtering," *Proc. American Control Conference (ACC)*, Portland, Oregon, June 4-6 2014, pp. 634-641.

56. J. Yu, **S.-J. Chung**, and P. G. Voulgaris, "Traveled Distance Minimization and Hierarchical Strategies for Robotic Networks," *2014 International Symposium on Communications, Control, and Signal Processing (ISCCSP)*, May 22-23, Athens, Greece, 2014, pp. 491-496.
55. J. Yu, **S.-J. Chung**, and P. G. Voulgaris, "Distance Optimal Target Assignment in Robotic Networks under Communication and Sensing Constraints," *IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, May 31 - June 7, 2014, pp. 1098-1105. **(Acceptance rate: 48%)**
54. J. Yang, **S.-J. Chung**, S. Hutchinson, D. Johnson, M. Kise, "Vision-Based Localization and Mapping for an Autonomous Mower," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, November 3-7, 2013, pp. 3655-3662. **(Acceptance rate: 43%)**
53. A. A. Paranjape, K. Meier, **S.-J. Chung**, and S. Hutchinson, "Motion Primitives and 3-D Path Planning for Fast Flight through a Forest," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, November 3-7, 2013, pp. 2940-2947. **(Acceptance rate: 43%)**
52. A. Dani, G. Panahandeh, **S.-J. Chung**, and S. Hutchinson, "Image Moments for Higher-Level Feature Based Navigation," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, November 3-7, 2013, pp. 602-609. **(Acceptance rate: 43%)**
51. A. Paranjape, **S.-J. Chung**, H. H. Hilton, "Optimizing the Forces and Propulsive Efficiency in Bird-Scale Flapping Flight," *AIAA Atmospheric Flight Mechanics (AFM) Conference*, Boston, MA, August 2013, AIAA 2013-4916.
50. J. Yang, A. Dani, **S.-J. Chung**, and S. Hutchinson, "Inertial-Aided Vision-Based Localization and Mapping in a Riverine Environment with Reflection Measurements," *AIAA Guidance, Navigation, and Control (GNC) Conference*, Boston, MA, August 2013, AIAA 2013-5246.
49. A. Paranjape, **S.-J. Chung**, and S. Hutchinson, "Optimum Spatially Constrained Turns for Agile Micro Aerial Vehicles," *AIAA Guidance, Navigation, and Control (GNC) Conference*, Boston, MA, August 2013, AIAA 2013-4941.
48. S. Bandyopadhyay, **S.-J. Chung**, and F. Y. Hadaegh, "Inhomogeneous Markov Chain Approach to Probabilistic Swarm Guidance Algorithm," May 2013, *5th Int. Conf. on Spacecraft Formation Flying Missions and Technologies (SFFMT)*, Munich, Germany.
47. D. Morgan, **S.-J. Chung**, and F. Y. Hadaegh, "Decentralized Model Predictive Control of Swarms of Spacecraft," May 2013, *5th Int. Conf. on Spacecraft Formation Flying Missions and Technologies (SFFMT)*, Munich, Germany.
46. D. Morgan, **S.-J. Chung**, and F. Y. Hadaegh, "Decentralized Model Predictive Control of Swarms of Spacecraft Using Sequential Convex Programming," *Proc. 23rd AAS/AIAA Space Flight Mechanics Meeting*, Kauai, Hawaii, February 10-14, 2013, AAS 13-439.
45. A. P. Dani, **S.-J. Chung**, and S. Hutchinson, "Observer Design for Stochastic Nonlinear Systems using Contraction Analysis," *Proc. IEEE Conference on Decision and Control (CDC)*, Maui, HI, December 2012, pp. 6028-6035. **(Acceptance rate: 53%)**
44. A. Paranjape, J. Guan, **S.-J. Chung**, M. Krstic, "PDE Boundary Control for Euler-Bernoulli Beam Using a Two Stage Perturbation Observer," *Proc. IEEE Conference on Decision and Control (CDC)*, Maui, HI, December 2012, pp. 4442-4448. **(Acceptance rate: 53%)**
43. D. Rao, **S.-J. Chung**, and S. Hutchinson, "CurveSLAM: An approach for Vision-based Navigation without Point Features," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vilamoura, Algarve, Portugal, October 7-12, 2012, pp. 4198-4204. **(Acceptance rate: 45%)**
42. D. Morgan, **S.-J. Chung**, and F. Y. Hadaegh, "Spacecraft Swarm Guidance Using a Sequence of Decentralized Convex Optimizations," *AIAA/AAS Astrodynamics Specialist Conference*, Minneapolis, MN, August 2012, AIAA-2012-4583.
41. A. Paranjape, J. Kim, and **S.-J. Chung**, "Closed-Loop Perching and Spatial Guidance Laws for Bio-Inspired Articulated Wing MAV," *AIAA Guidance, Navigation, and Control (GNC) Conference*, Minneapolis, MN, August 2012, AIAA-2012-4979.
40. W. Lai, A. F. Bastawros, W. Hong, and **S.-J. Chung**, "Fabrication and Analysis of Planar Dielectric Elastomer Actuators Capable of Complex 3-D Deformation," *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, St. Paul, Minnesota, May 14-18, 2012, pp. 4968-4973. **(Acceptance rate: 40%)**

39. A. Paranjape, **S.-J. Chung**, and M. Krstic, "PDE Boundary Control for Flexible Articulated Aircraft Wings," *Proc. ALAA Guidance, Navigation, and Control Conference (GNC)*, Portland OR, August 2011, AIAA-2011-6486.
38. A. Paranjape, J. Kim, N. Gandhi, and **S.-J. Chung**, "Experimental Demonstration of Perching by an Articulated Wing MAV," *Proc. ALAA Guidance, Navigation, and Control (GNC) Conference*, Portland OR, August 2011, AIAA-2011-6403.
37. D. Morgan, **S.-J. Chung**, L. Blackmore, B. Acikmese, D. Bayard, and F. Y. Hadaegh, "Swarm Keeping Strategies for Spacecraft under J2 and Atmospheric Drag Perturbations," *Proc. ALAA Guidance, Navigation, and Control (GNC) Conference*, Portland, OR, August 2011, AIAA-2011-6632.
36. **S.-J. Chung**, I. Chang, and F. Y. Hadaegh, "Phase Synchronization Control of Robotic Networks on Periodic Ellipses with Adaptive Network Topologies," *Proc. ALAA Guidance, Navigation, and Control (GNC) Conference*, Portland, OR, August 2011, AIAA-2011-6631.
35. **S.-J. Chung** and F. Y. Hadaegh, "Swarms of Femtosats for Synthetic Aperture Applications," *4th International Conference on Spacecraft Formation Flying Missions and Technologies (SFFMT)*, St-Hubert, Quebec, May 18-20, 2011.
34. I. Chang, **S.-J. Chung**, and F. Y. Hadaegh, "Novel Coordinate Transformation and Robust Cooperative Formation Control for Swarms of Spacecraft," *4th International Conference on Spacecraft Formation Flying Missions and Technologies (SFFMT)*, St-Hubert, Quebec, May 18-20, 2011.
33. D. Morgan, **S.-J. Chung**, L. Blackmore, B. Acikmese, D. Bayard, and F. Y. Hadaegh, "Dynamics and Control Challenges of Spacecraft Swarms under the Influence of J2 Gravity and Atmospheric Drag," *4th International Conference on Spacecraft Formation Flying Missions and Technology (SFFMT)*, St-Hubert, Quebec, May 18-20, 2011.
32. M. Duffy, **S.-J. Chung**, and L. A. Bergman, "An Evolutionary Architecture for the Automated Conceptual Design of Aerospace Systems," *ALAA Infotech@Aerospace Conference*, St. Louis, MO, Mar. 2011, AIAA-2011-1632.
31. P. D. Kuang, M. Dorothy, and **S.-J. Chung**, "RoboBat: Dynamics and Control of a Robotic Bat Flapping Flying Testbed," *ALAA Infotech@Aerospace Conference*, St. Louis, MO, Mar. 2011, AIAA-2011-1435.
30. J. Yang, D. Rao, **S.-J. Chung**, and S. Hutchinson, "Monocular Vision SLAM for MAV in GPS-denied Riverine Environments," *ALAA Infotech at Aerospace Conference*, St. Louis, MO, Mar. 2011, AIAA-2011-1403.
29. B. Aubin, B. Conway, and **S.-J. Chung**, "Finding Optimal Relative Orbit Transfer Trajectories with the Particle Swarm Algorithm and Primer Vector Theory," *21st AAS/ALAA Space Flight Mechanics Meeting*, New Orleans, Louisiana, February 2011, AAS 11-160.
28. I. Chang, **S.-J. Chung** and L. Blackmore, "Cooperative Control with Adaptive Graph Laplacians for Spacecraft Formation Flying," *49th IEEE Conference on Decision and Control (CDC)*, Atlanta, GA, Dec. 2010, pp. 4926–4933. **(Acceptance rate: 62%)**
27. **S.-J. Chung** and J.-J.E. Slotine, "On Synchronization of Coupled Hopf-Kuramoto Oscillators with Phase Delays," *49th IEEE Conference on Decision and Control (CDC)*, Atlanta, GA, Dec. 2010, pp. 3181-3187. **(Acceptance rate: 62%)**
26. A. Paranjape, A. Chakravarthy, **S.-J. Chung**, and H. H. Hilton, "Performance and Stability of an Agile Tail-less MAV with Flexible Articulated Wings," *ALAA Atmospheric Flight Mechanics Conference*, Toronto, Ontario, Aug. 2010, AIAA-2010-7937.
25. A. Chakravarthy, A. Paranjape, and **S.-J. Chung**, "Control Law Design for Perching an Agile MAV with Articulated Wings," *ALAA Atmospheric Flight Mechanics Conference*, Toronto, Ontario, Aug. 2010, AIAA-2010-7934.
24. M. Dorothy and **S.-J. Chung**, "Methodological Remarks on CPG-Based Control of Flapping Flight," *ALAA Atmospheric Flight Mechanics Conference*, Toronto, Ontario, Aug. 2010, AIAA-2010-7634.
23. A. Paranjape and **S.-J. Chung**, "Flight Mechanics of a Tailless Articulated Wing Aircraft," *ALAA Atmospheric Flight Mechanics Conference*, Toronto, Ontario, Aug. 2010, AIAA-2010-7633.

22. I. Chang and **S.-J. Chung**, "Exponential Stability Region Estimates for the State-Dependent Riccati Equation Controllers," *48th IEEE Conference on Decision and Control Conference (CDC)*, Shanghai, Dec. 2009, pp. 1974 - 1979. **(Acceptance rate: 47%)**
21. K. Celik, **S.-J. Chung**, M. Clausman, and A. K. Somani, "Monocular Vision SLAM for Indoor Aerial Vehicles," *Proc. 2009 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, St. Louis, MO, October 2009, pp. 1566-1573.
20. I. Chang and **S.-J. Chung**, "Bio-Inspired Adaptive Cooperative Control of Heterogeneous Robotic Networks," *2009 AIAA Guidance, Navigation, and Control (GNC) Conference and Exhibit*, Chicago, IL, August 2009, AIAA 2009-5886.
19. K. Celik, **S.-J. Chung**, and A. K. Somani, "Biologically Inspired Monocular Vision Based Navigation and Mapping in GPS-Denied Environments," *AIAA Infotech at Aerospace and Unmanned Unlimited Conference and Exhibit*, Seattle, WA, 6-9 April 2009, AIAA-2009-1962.
18. **S.-J. Chung**, J. Stoner, and M. Dorothy, "Neurobiologically Inspired Control of Engineered Flapping Flight," *AIAA Infotech@Aerospace and Unmanned Unlimited Conference and Exhibit*, Seattle, WA, 6-9 April 2009, AIAA-2009-1929. **Best Paper Award.**
17. K. Berg-Taylor, K. Seo, and **S.-J. Chung**, "Sensor Based Path Planning in Highly Constrained Environments for Agile Autonomous Vehicles," *Proc. of the AIAA Guidance, Navigation, and Control Conference and Exhibit*, Honolulu, HI, August 2008, AIAA-2008-7168.
16. K. Celik, **S.-J. Chung**, and A. K. Somani, "MVC-SLAM: Mono-Vision Corner SLAM for Autonomous Micro-Helicopters in GPS Denied Environments," *Proc. of the AIAA Guidance, Navigation, and Control Conference and Exhibit*, Honolulu, HI, August 2008, AIAA-2008-6670.
15. **S.-J. Chung**, U. Ahsun, and J.-J.E. Slotine, "Attitude and Phase Synchronization of Formation Flying Spacecraft: Lagrangian Approach," *Proc. of the AIAA Guidance, Navigation, and Control Conference and Exhibit*, Honolulu, HI, August 2008, AIAA-2008-6472.
14. K. Berg-Taylor, K. Seo, and **S.-J. Chung**, "Development of a Car-like Online Navigation Testbed," *IEEE International Conference on Electro/Information Technology (EIT)*, Ames, IA, May 2008, pp. 337 - 342.
13. K. Celik, **S.-J. Chung**, and A. Somani, "Mono-Vision Corner SLAM for Indoor Navigation," *IEEE International Conference on Electro/Information Technology (EIT)*, Ames, IA, May 2008, pp. 343-348. **Best Paper Award.**
12. K. Seo, **S.-J. Chung**, and J.-J. E. Slotine, "CPG-based Control of a Turtle-like Underwater Vehicle," June 25-28, 2008, *Proceedings of the 2008 Robotics: Science and Systems Conference (RSS)*, Switzerland, pp. 127-134. **(Acceptance rate: 25.8%)**
11. **S.-J. Chung**, and J.-J. E. Slotine, "Cooperative Robot Control and Synchronization of Lagrangian Systems," *Proceedings of the 46th IEEE Conference on Decision and Control (CDC)*, New Orleans, LA, December 2007, pp. 2504-2509.
10. **S.-J. Chung**, U. Ahsun, J.-J. E. Slotine, and D. W. Miller, "Application of Synchronization to Cooperative Control and Formation Flight of Spacecraft," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, Hilton Head, SC, 2007, AIAA-2007-6861.
9. **S.-J. Chung**, J.-J. E. Slotine, and D. W. Miller, "New Control Strategies for Underactuated Tethered Formation Flight Spacecraft," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, Hilton Head, SC, 2007, AIAA-2007-6858.
8. **S.-J. Chung**, "Nonlinear Model Reduction and Decentralized Control of Tethered Formation Flight by Oscillation Synchronization," *Proceedings of the AIAA Guidance, Navigation and Control Conference*, Keystone, Colorado, August 2006, AIAA-2006-6589. **Finalist, Best Student Paper Award**
7. **S.-J. Chung**, D. Adams, D. W. Miller, E. Lorenzini, and D. Leisawitz, "SPHERES Tethered Formation Flight Testbed: Advancements in Enabling NASA's SPECS Mission," *Proceedings of Astronomical Telescopes and Instrumentation 2006 Conference*, SPIE Paper No. 6268-11, May 2006.
6. **S.-J. Chung**, E. M. Kong, and D. W. Miller, "Dynamics and Control of Tethered Formation Flight Spacecraft Using the SPHERES Testbed," *Proceedings of AIAA Guidance, Navigation, and Control Conference*, San Francisco, August 2005, AIAA-2005-6089.
5. **S.-J. Chung**, E. Kong, and D. W. Miller, "SPHERES Tethered Formation Flight Testbed: Application to NASA's SPECS Mission," *Proceedings of the SPIE Optics and Photonics 2005. UV/Optical/IR Space*

Telescopes: Innovative Technologies and Concepts II Conference, Vol. 5899, San Diego, CA, August 2005, pp. 196-208.

4. D. Lobosco, C. Blaurock, **S.-J. Chung**, D. W. Miller, "Integrated modeling of optical performance for the Terrestrial Planet Finder structurally connected interferometer," *Proceedings of the SPIE Astronomical Telescopes and Instrumentation Conference*, Vol. 5497, June 2004, Glasgow, Scotland United Kingdom, pp. 278-289.
3. **S.-J. Chung**, D. Lobosco, D. W. Miller and C. Blaurock, "Multidisciplinary Control of a Sparse Interferometric Array Satellite Testbed," *Proceedings of the ALAA Guidance, Navigation, and Control Conference*, Austin, Texas, August 2003, AIAA-2003-5433.
2. **S.-J. Chung**, D. W. Miller, and O. L. de Weck, "Design and Implementation of Sparse Aperture Imaging Systems," *SPIE Astronomical Telescopes and Instrumentation Conference*, Waikoloa, Hawaii, August 2002, Proceedings of the SPIE 4849-25, p.181-192.
1. **S.-J. Chung** and D. W. Miller, "Design, Implementation and Operation of a Sparse Aperture Imaging Satellite Testbed," August 2002, *Proceedings of the 16th Annual ALAA/USU Conference on Small Satellites*, Logan, Utah.

e. Other Publications (Books and Reports)

1. S. Cho, **S.-J. Chung**, *et al.*, **CBT TOEFL Know-How**, a book of study strategies for the TOEFL English Test, 332 pages, SodamQ press, in Korean, 2001, ISBN-13 9788973815050, ISBN-10 8973815059.
2. Soon-Jo Chung "Design, Implementation and Control of a Sparse Aperture Imaging Satellite" MIT Space Systems Lab (SSL) Report no. 19-02, **MIT Master of Science (SM) Thesis**, September 2002. Advisor: David W. Miller
3. Soon-Jo Chung, "Nonlinear Control and Synchronization of Multiple Lagrangian Systems with Application to Tethered Formation Flight Spacecraft," MIT Space Systems Lab (SSL) Report no. 7-07: **MIT Doctor of Science (ScD) Thesis**, June 2007.
Thesis supervisor: David W. Miller and Co-advisor: Jean-Jacques E. Slotine

f. Patents

1. A. A. Paranjape and **S.-J. Chung**, "Controlled Transitory or Sustained Gliding Flight with Dihedral Angle and Trailing Flaps," **US Patent No.: US 9,394,050 B2**, Date of Patent: Jul. 19, 2016.
2. X. Shi, M. Veismann, C. Dougherty, S. Rider, **S.-J. Chung**, M. Gharib, K. Kim, S. Rahili, and R. Nemovi "Autonomously Flying Ambulance," Non-provisional US Patent Pending, Application Number US20190106206A1.
3. G. Shi, X. Shi, M. T. O'Connell, A. Anandkumar, Y. Yue, and **S.-J. Chung**, "Neural Lander: Stable Drone Landing Control Using Learned Dynamics," Provisional US Patent filed on 12/10/2018
4. **S.-J. Chung**, A. A. Paranjape, and K. Kim, "Robotic Herding of a Flock of Birds Using an Unmanned Aerial Vehicle," Non-Provisional US Patent Application filed on 7/26/2019. Application number 16/523,889.
5. V. Capuano, A. Harvard, and S.-J. Chung, "S-CDGNSS Fusion With Other Sensors for Robust And Accurate Relative Navigation," Provisional US Patent filed on 8/16/2019.
6. A. Fragoso and S.-J. Chung, "Decorrelation-based domain adaptation," Provisional US Patent filed on 8/26/2019.
7. S.-J. Chung, M. Gharib, K. Kim, and P. Spieler, LEONARDO: Synchronized Aerial And Legged Robot, Provisional US Patent filed on 12/23/2019
8. S.-J. Chung and K. Kim, "Safe Flight Control Of Multirotors Subject To Propeller Failure," Provisional US Patent filed on 4/21/2020

g. Museum Exhibit

Bat Bot (B2), Animals: Respect, Harmony, and Subjugation, Museum of Arts and Crafts in Hamburg, November 2017-March 2018. Special display of our Bat Bot (B2) along with the work of Albrecht Dürer and Alexander von Humboldt

h. Invited Lectures

Title	Conference	Location	Date
Multi-agent cooperative control and estimation for flying cars and spacecraft swarms	Aerospace Controls: Current Topics in Theory and Practice	American Control Conference, Philadelphia	7/8/2019
Multi-agent cooperative control and estimation for flying cars and spacecraft swarms	Invited Seminar (Host: Prof. Emilio Frazzoli)	ETH, Zurich	6/28/2019
Autonomous Space Swarms and In-Orbit Construction	NTU-Caltech Space Symposium	Nanyang Technological University, Singapore	2/14/2019
Multi-agent cooperative control and estimation for flying cars and spacecraft swarms”	Invited Seminar	University of California, Santa Barbara	3/8/2019
Small Satellites	Caltech Space Innovation Council	Caltech	11/15/2018
Stronger Together-Coordination Among Spacecraft for Novel Exploration Strategies	Caltech KISS Workshop Short Course	Caltech Keck Institute of Space Studies	10/29/2018
Multi-agent cooperative control and estimation for flying cars and spacecraft swarms	Joint CSC@USC/CommNetS-MHI Seminar Series	University of Southern California	9/17/2018
Multi-Agent Cooperative Control and Estimation for Flying Taxis and Spacecraft Swarms	(Invited Speaker) IFAC Networked & Autonomous Air & Space Systems Workshop	Santa Fe, NM	6/13/2018
Nonlinear stochastic incremental stability for aerospace robotics applications	Symposium on Dynamical Systems and Related Fields	University of Waterloo, Canada	5/17/2018
CAST Autonomous Flying Ambulance	JPL and Caltech Seminar Series (Lab-wide Seminar)	JPL	1/18/2018
Building in Space: In-Orbit Additive Construction Using Modular Swarms of Spacecraft	SpaceTech Expo (invited speaker)	Pasadena, CA	5/23/2017
Optimality and Nonlinear Stability for Aerospace Robotics	Southern California Robotics Symposium (invited speaker)	USC	4/14/2017

Title	Conference	Location	Date
Creating a Giant Reconfigurable Space Systems Using Thousands of Spacecraft: Guidance & Control Perspectives	Breakwell Lectureship	Dept. of Aero/Astro, Stanford University	1/20/2017
Fusing Nonlinear Control Theory with Real-time Optimization: Creating Complex Reconfigurable Robotic Systems using Millions of Microbots	Robotics Section Seminar	JPL Robotics Section	10/5/2016
Creating Giant Reconfigurable Space Systems Using Thousands of Spacecraft: Guidance & Control Perspectives	Invited Departmental Seminar	MAE Dept, UCLA	5/10/2016
Creating Giant Reconfigurable Space Systems Using Thousands of Spacecraft: Guidance & Control Perspectives	GALCIT Colloquium	Caltech	11/13/2015
Development and Flight Control of Robotic Bats and Birds with Articulated Wings.	Invited Speaker, IEEE ICRA Workshop, Robotics-Inspired Biology and Bio-Inspired Robotics	IEEE International Conference on Robotics and Automation (ICRA)	5/26/2015
Revolutionary Aerial Drones: Control and Estimation Challenges of Developing Robotic Falcons to Prevent Airport Bird Strikes	Invited GRASP Lab Seminar (Host: Prof. Vijay Kumar)	GRASP Lab, University of Pennsylvania	2/13/2015
Mathematical Modelling and Nonlinear Stability Analysis of Central Pattern Generators for Locomotion and Flight	4th Annual Winter Workshop on the Neuromechanics and Dynamics of Locomotion	Tulane University	1/28/2015-1/29/2015
Guidance and Control of Swarms of Femtosatellites for Synthetic Aperture Applications	NPS/NRO Sparse Aperture Systems Technical Exchange Meeting	Naval Postgraduate School	11/4/2014-11/5/2014

Title	Conference	Location	Date
Revolutionary Aerial Drones: Control and Estimation Challenges of Developing Robotic Falcons to Prevent Airport Bird Strikes	Departmental Colloquium	MAE Dept., Cornell University	9/2/2014
Revolutionary Aerial Drones: Control and Estimation Challenges of Developing Robotic Falcons to Prevent Airport Bird Strikes	Plenary Speaker: Symposium on Unmanned Vehicles	Ulsan National Institute of Science and Technology (UNIST)	8/27/2014
Vision-Based Navigation and Motion Planning of High-Speed Flight through Dense Forests	Invited JPL Computer Vision and Robotics Group Seminar (Host: Dr. Larry Matthies)	Jet Propulsion Laboratory, Caltech	8/5/2014
Vision-Based Navigation, Motion Planning, and PDE Control of Wing Flexibility for High-Speed Flight	Invited JPL Control and Analysis Group Seminar	Jet Propulsion Laboratory, Caltech	7/31/2014
Nonlinear Control and Estimation Challenges of Developing Robotic Falcons to Prevent Airport Bird Strikes	Invited Seminar (Host: Marco Pavone)	Dept. Aero/Astro., Stanford University	4/24/2014
Revolutionary Aerial Drones: Development of Robotic Falcons to Prevent Airport Bird Strikes	Spring 2014 DCL Seminar Series (Host: Prof. Magnus Egerstedt)	Decision and Control Laboratory, Georgia Institute of Technology	3/28/2014
Nonlinear Control and Estimation Challenges of Developing Robotic Falcons to Prevent Airport Bird Strikes	Invited Seminar	Department of Mechanical and Aerospace Engineering, Seoul National University	11/8/2013
Revolutionary Aerial Drones: Development of Robotic Falcons to Prevent Airport Bird Strikes	Share the Vision 2013 (among 35 invited faculty speakers)	University of Illinois at Urbana-Champaign (Hosted by the Office of Technology Management)	10/10/2013
Control and Estimation Challenges of Developing Robotic Falcons to Prevent Airport Bird Strikes	Invited Seminar (Host: Prof. Behcet Acikmese)	Aerospace Engineering Department, University of Texas, Austin	9/6/2013

Title	Conference	Location	Date
Control and Estimation Challenges of Developing Robotic Falcons to Prevent Airport Bird Strikes	Invited Departmental Seminar (Host: Prof. John Valasek)	Aerospace Engineering Department, Texas A&M University	9/5/2013
Control Challenges of Realizing a Soft-Winged Aerial Robot that Can Fly like a Bat	Fall 2013 LCSR & CISST Seminars (Host: Profs. Noah Cowan, Marin Kobilarov)	Laboratory for Computational Sensing and Robotics/Engineering Research Center, Johns Hopkins University	11/2/2012
Control Challenges of Realizing a Soft-Winged Aerial Robot that Can Fly like a Bat	Invited Seminar hosted by Dr. Samuel Stanton (ARO)	Army Research Laboratory (ARL)	11/1/2012
Controlling Swarms of Spacecraft Inspired by Biological Oscillators	A workshop on the future of aerospace controls and decision (hosted by Prof. Eric Feron)	School of Aerospace Engineering, Georgia Tech	6/12/2012
Control Challenges of Realizing a Soft-Winged Aerial Robot that Can Fly like a Bat	Aerospace Guidance and Control Systems Committee (AGCSC)	109th AGCSC Meeting at Salt Lake City, Utah	3/9/2012
Control Challenges of Realizing a Soft-Winged Aerial Robot that Can Fly like a Bat	Decision and Control Lecture Series	Coordinated Science Laboratory, University of Illinois at Urbana-Champaign	1/25/2012
Bio-inspired Flight Mechanics, Flight Controls, Vision-based Navigation and SWARM Spacecraft	AIAA General Meeting	UIUC AIAA Student Branch	12/7/2011
Vision based navigation by using monocular vision (invited speaker)	UAS Video Tracking Workshop and Challenge	Texas A&M University	10/25/2011
Reduction of complex systems by synchronization: application to flapping flight and formation flying	Illinois/Purdue Dynamics Research Meeting (Host: H. Dankowicz)	Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign	2/26/2011
Synchronization: Formation Flying iPhones to Engineered Flapping Flight	Invited Departmental Seminar	School of Aeronautics and Astronautics, Purdue University	12/9/2010
Neurobiologically Inspired Control of Engineered Flapping Flight (Invited Speaker)	AFOSR/ONR Joint Workshop on Bio-Inspired Robotics	AFOSR/ONR	5/21/2010

Title	Conference	Location	Date
Synchronization: From Formation Flying iPhones to Engineered Flapping Flight	Invited Departmental Seminar	Department of Mechanical and Industrial Engineering, University of Iowa	4/15/2010
New Opportunities for Complex Spacecraft Systems: Biology, Neuroscience, and Computer Vision	Guidance & Control Group, Seminar Series	NASA/Caltech Jet Propulsion Laboratory	11/12/2009
New Opportunities for Complex Aerospace Systems: Biology, Neuroscience, and Computer Vision for Control and Navigation of Aerospace Vehicles	Invited Seminar	Air Force Research Laboratory, Wright Patterson Air Force Base	6/16/2009
New Opportunities for Complex Aerospace Systems: Biology, Neuroscience, and Computer Vision for Control and Navigation of Aerospace Vehicles	Invited Departmental Seminar	Department of Aerospace Engineering, University of Illinois at Urbana-Champaign	5/11/2009
Synchronization of Multiple Dynamical Systems: What Fireflies Have in Common with Formation Flying Spacecraft?	Invited Departmental Seminar	School of Aerospace Engineering, Georgia Institute of Technology	11/1/2006
Synchronization of Multiple Dynamical Systems: What Fireflies Have in Common with Formation Flying Spacecraft?	Invited Departmental Seminar	Department of Aerospace Engineering, Iowa State University	8/7/2006
Synchronization of Multiple Dynamical Systems: What Fireflies Have in Common with Formation Flying Spacecraft?	Material and Mechanical Science Group Presentation Series	Schlumberger Research Center, Cambridge, MA	5/16/2006
Synchronization Control of Multiple Dynamical Systems	Invited Departmental Seminar	Mechanical Materials, and Aerospace Engineering Department Illinois Institute of Technology	3/22/2006
SPHERES Tethered Formation Flight Testbed: Application to NASA's SPECS Mission	Invited Departmental Seminar	MAE Dept., Seoul National University	1/2005

8. Research Areas and Grants, Contracts, and Gifts

a. Areas of Research

Distributed spacecraft systems, space autonomous systems, and aerospace robotics, and in particular, on the theory and application of complex nonlinear dynamics, control, estimation, guidance, and navigation of autonomous space and air vehicles.

b. Research Grants

Brief Title or Description	Source of Funds	Years	Role (# of PIs)
Bio-Inspired Integrated Sensing and Control of Flapping Flight for Micro Aerial Vehicles	AFOSR	2/15/2009-11/30/2011	PI (1)
Bio-Inspired Flexible Cellular Actuating Systems	ARO	8/1/2010-7/31/2013	PI (2)
Testbed Demonstration of Swarms of Femtosats (one of the only two DRDF projects that do not have CALTECH co-PIs that year).	JPL DRDF	6/13/2011-3/25/2012	PI (1)
Vision-Based Navigation in Riverine Environments	ONR	1/1/2011-11/30/2013	PI (2)
Dynamics and Controls of Swarms of Femtosatellites	NASA NSTRF	8/11/2011-8/10/2015	PI (1)
Vision Containment for Robotic Mowing	John Deere (JDTIC)	1/1/2012-12/31/2014	Co-PI (2)
UAS Vision-Tracking Challenge	Rockwell Collins	3/2012-5/2014	PI (1)
Minimal Representation and Decision Making for Networked Autonomous Agents	AFOSR	5/1/2012-4/30/2015	Co-PI (5)
CAREER: Control and Sensing Strategies for Robotic Falcons to Prevent Airport Bird Strikes	NSF	2/15/2013-1/31/2018	PI (1)
System Engineering Study of CubeSat Formation Flying	JPL	8/26/2013-8/31/2014	PI (1)
Revolutionary Aerial Drones: Control and Motion Planning Algorithms for Robotic Falcons to Prevent Airport Bird Strikes (Center for Advanced Study Beckman Fellowship)	UIUC CAS	8/2014-5/2015	PI (1)
Vision-Centric Multi-Sensor Fusion for Navigation in Riverine Environments	ONR	4/1/2014-3/31/2017	PI (2)
NRI/Collaborative Research: Improving the Safety and Agility of Robotic Flight with Bat-Inspired Flexible-Winged Robots	NSF	8/1/2014-7/31/2017	Co-PI (6)
Novel Methodology for Control and Stabilization of Spacecraft with Captured Asteroid (Phase 1)	NASA CIF	11/1/2014-8/31/2015	PI (1)

Brief Title or Description	Source of Funds	Years	Role (# of PIs)
Strain Actuated Solar Array for SC Attitude & Instrument Jitter Control (Phase 1)	JPL	11/1/2014-10/31/2015	Co-PI (2)
In-Orbit Additive Construction Using Modular Swarms of Spacecraft	NASA NSTRF	8/1/2015-7/31/2019	PI (1)
Fast Optimal Motion Planning with High Fidelity Dynamics	JPL	10/1/2015-9/30/2016	PI (1)
Strain Actuated Solar Array for SC Attitude & Instrument Jitter Control (Phase 2)	JPL	11/1/2015-10/31/2016	Co-PI (2)
Novel Methodology for Control and Stabilization of Spacecraft with Captured Asteroid (Phase 2)	NASA CIF	10/1/2015-9/30/2016	PI (1)
Cooling, Annealing, and Pointing Satellite (CAPSAT)	NASA USIP	2016-2017	Co-I
Fast Optimal Motion Planning with High Fidelity Dynamics (Phase 2)	JPL	10/1/2016-9/30/2017	PI (1)
Mathematical Framework of Controlling Heterogeneous Groups of Autonomous Vehicles	KAIST	2017-2018	PI (1)
System Level Autonomy to Enable Autonomous Mapping Missions of Small Solar System Bodies	JPL 3x Strategic R&TD	2017-2019	PI (1)
Distributed Swarm Antenna Arrays for Deep Space Applications	Keck Institute for Space Studies (KISS)	2017-2018	PI (1)
Guidance of Swarms Deployed from the Back Shell of the Mars Spacecraft for Distributed Science	NASA Center Innovation Fund	2017-2019	PI (1)
Autonomous Approach of Small Unknown Bodies	JPL Topical R&TD	2017-2019	PI (1)
Advanced Assured Positioning, Navigation & Timing Technology	Boeing	2017-2019	PI (1)
CAST: Precision Navigation	AeroVironment	2017-2019	PI (1)
Physics-Driven Swarm Autonomy for On-Demand and Transforming Shapes and Functions	JPL	2017-2018	3 PIs
Cooperative Navigation and Swarm Mapping for Spacecraft Swarms	Stanback Space Innovation Fund	2018-2019	PI (1)
Autonomous Drone-based Observation and Sampling of Volcanic Gases	Terrestrial Hazard Observation and Reporting (THOR) Center	2018-2019	4 PIs
Large Constellations and Formations for Exploring Interstellar Objects and Long-Period Comets	Keck Institute for Space Studies (KISS)	2018	Co-Lead (3)

Brief Title or Description	Source of Funds	Years	Role (# of PIs)
Autonomous Drone-Based Geobiological Imaging and Mapping	Agouron Institute	2018-2020	Co-PI
Learning-Based Robust Flight Control	Raytheon	2018-2020	Co-PI
Swarm Autonomy	Raytheon	2018-2020	Co-PI
Caltech Autonomous Flying Ambulance	CAST	2017-2018	2 PIs
Autonomous Drone-based Sampling of Volcanic Gas	JPL-Caltech PDF	2018-2020	Caltech PI
Enabling precision flyby and close-up imaging with UAVs	JPL-Caltech PDF	2018-2019	Caltech Co-PI
DARPA PAI: Physics-Infused Learning for Autonomous Dynamic Robots	DARPA	2018-2020	Co-PI
Innovative Hands on Education on CubeSat Attitude Control for Ae105	Stanback Space Innovation Fund	2019-2020	PI (1)
CAST-JPL Swarm Autonomy	JPL	2019	Co-PI (2 PIs)
A Robust Framework for Object Detection in Challenging Environments	Ford Motor Company	2019-2020	PI (1)
AeroVironment Control-Theoretic Design	AeroVironment	2019-2020	PI (1)
Visual Relative Navigation via Intelligent Ephemeral Relationships Phase I	DARPA	2019	Caltech PI
CAST-JPL Swarm Autonomy	JPL	2020	Co-PI
JPL Strategic RTD Distributed Aperture Radar Tomographic Sensors (DARTS) Trade Study and Technology Demonstration	JPL	2020-2022	Caltech PI
Distributed Aperture Radar Tomographic Sensors (DARTS)	NASA	2020-2022	Caltech PI
Autonomous Flying Ambulance	CAST	2019-2020	PI
Leonardo	CAST	2019-2020	PI
Advanced Assured Positioning, Navigation & Timing Technology	Boeing	2019-2020	PI (1)
Deep Space Autonomous Servicing	NASA	2019-2020	Caltech PI
Visual Relative Navigation via Intelligent Ephemeral Relationships Phase II	DARPA	2020-2023	Caltech PI

c. Instruction Grants

Years	Brief Title or Description	Source of Funds	Role
2014	Composite Aviation Project (U of I AE Student Aircraft Builders)	UIUC Student Sustainability Committee (SSC)	PI (1)

Years	Brief Title or Description	Source of Funds	Role
2011	NASA ESMD Senior Design Project Funding (for the NASA Lunarobotics Team)	NASA	2

9. Service

a. Departmental or Institute Service at Caltech and JPL

1. JPL Autonomy Grand Challenges A-Team Study, October 23, 2018.
2. NASA Science Mission Directorate (SMD) Autonomy Workshop (Invited Participant), October 10-11, 2018.
3. **Autonomous Formation Flying Co-Lead**, Coordinated Constellation for Earth Observations Planning, JPL Earth Science Directorate 2017- present
4. Scientific Advisory Board Member, Caltech Center for Autonomous Systems and Technologies (CAST), 2017-present
5. Faculty Search Committee, 2017-2019
6. Ae208 GALCIT Colloquium Organizer, 2017-2018

b. Federal and State

1. Invited Panelist, NSF Workshop on Future Directions for Controls, 11/2/2011
2. NSF Proposal Review Panelist, NSF CMMI, 1/19-1/20, 2011
3. NSF Proposal Review Panelist, NSF CMMI division, April 21-22, 2009
4. Served as a review panelist for NSF's Cyber-Enabled Discovery and Innovation (CDI) Type II proposals in the area of bio-inspired engineering, February 14-15, 2008
5. Proposal Reviewer for Army Research Office (ARO)
6. Proposal Reviewer for Air Force Office of Scientific Research (AFOSR)

c. Reviewer for Journals and Conferences

SPIE Optical Engineering; AIAA Journal of Guidance, Control and Dynamics (Selected Excellent Reviewer 2006, 2010); IEEE Transactions on Automatic Control; Automatica; IEEE Transactions on Robotics; The International Journal of Robotics Research; IEEE Transactions on Control of Network Systems; Bioinspiration & Biomimetics; IEEE Transactions on Control System Technology; Journal of Field Robotics; IEEE Systems Journal; System & Control Letters; International Journal of Robust and Nonlinear Control; Journal of the Royal Society Interface; IEEE Transactions on Aerospace and Electronic Systems; The Journal of the Astronautical Sciences; Journal of Spacecraft and Rockets; IEEE Transactions on Circuits and Systems I; IET Control Theory & Applications; Astrophysics and Space Science An International Journal of Astronomy; Astrophysics and Space Science; International Journal of Adaptive Control and Signal Processing; IEEE/ASME Transactions on Mechatronics; International Journal of Control; International Journal of Control, Automation, and Systems; International Journal of Aerospace Engineering; AIAA Guidance, Navigation, and Control (GNC) Conference and Exhibit; IEEE International Conference on Intelligent Robots and Systems (IROS); Robotics: Science and Systems (RSS); IEEE International Conference on Robotics and Automation (ICRA); American Control Conference (ACC); IEEE Conference on Decision and Control (CDC); AIAA Infotech@Aerospace and Unmanned Unlimited Conference; IEEE Multi-Conference on Systems and Control (MSC); IEEE International Conference on Electro/Information Technology (EIT)

d. Departmental Service at UIUC

1. AE Department Seminar Series (AE590) Chair, Spring 2016
2. AE Stilwell Lectureship Selection Committee (Chair), Fall 2015- Spring 2016
3. AE Undergraduate Curriculum Committee, Spring 2014 and Fall 2014
4. 2 Faculty Search Committees (Space Systems, Autonomous Systems), 2013
5. AE Doctoral Qualifying Exam Chair (ACDS Field), January 2012, June 2012, January 2016
6. Chair, Monthly Departmental Faculty Meetings, September 2011-May 2012
7. 2 Faculty Search Committees, (CFD, Space Systems), Aerospace Engineering, 2011-2012
8. 3 Faculty Search Committees, (Combustion/Propulsion, Mechanics/Structures, Systems Engineering Lecturer), Aerospace Engineering, 2010-2011
9. Undergraduate Curriculum Committee, Aerospace Engineering, 2011-2012, 2013-2013
10. Systems Engineering Committee, Aerospace Engineering, 2009-Spring 2011
11. Computer Committee 2009-2011, 2009-2011
12. Iowa State University: Equipment Planning & Safety Committee Discipline Committee, Guidance, Navigation, and Control Discipline Committee, Design/Systems Perspective

e. College Service at UIUC

1. College of Engineering Safety Advisory Committee (UIUC)
2. Engineering Library Committee (UIUC)
3. Engineering Open House Committee (UIUC)
4. New curriculum evaluation subcommittee for one course proposal, College of Engineering, Spring 2011 (UIUC)

10. Graduate Thesis Research Advising

a. Ph.D. Thesis Students (graduated 8 PhDs). Currently, supervising 14 Caltech PhD students

Student Name	Year Graduated	Ph.D. Thesis Title	Placement
Aditya Paranjape (UIUC)	12/2011	Dynamics and Control of Robotic Aircraft with Articulated Wings	Assistant Professor (Lecturer) of Aeronautical Engineering, Imperial College London (Previously, Assistant Professor, McGill Univ.)
Daniel Morgan (UIUC)	5/2015	Guidance and Control of Swarms of Spacecraft	Senior GNC Engineer, SpaceX
Junho Yang (UIUC)	12/2015 (co-advised with S. Hutchinson)	Vision based Estimation, Localization, and Mapping for Autonomous Vehicles	Senior Engineer, Hyundai Motor Company
Michael Dorothy (UIUC)	12/2015	Neuroinspired Control Strategies with Applications to Flapping Flight	Aerospace (control) engineer at the Army Research Lab
Saptarshi Bandyopadhyay (UIUC)	5/2016	Novel Probabilistic and Distributed Algorithms for Guidance, Control, and Nonlinear Estimation of Large-Scale Multi-Agent Systems	Robotics Technologist JPL
Kevin Meier (UIUC)	1/2018 (PhD final exam) co-advised with S. Hutchinson	Vision based agile motion planning of an aerial vehicle	Army Research Lab

Student Name	Year Graduated	Ph.D. Thesis Title	Placement
Michael Duffy (UIUC)	8/2019 co-advised with L. Bergman	Smooth Particle Hydrodynamics Simulation of the Fokker-Planck Equation	Raytheon Company
Rebecca Foust (UIUC)	8/2019	Optimal Guidance and Control of Heterogeneous Swarms for In-Orbit Self-Assembly of Large Space Structures: Algorithms and Experiments	JHU Applied Physics Laboratory
Xichen Shi (Caltech Ae)	2016-present		
Francesca Baldini (Caltech Ae)	2016-2019	JPL Small Body Mapping and Localization	Moved to another group at Caltech
Yashwanth Kumar Nakka (Caltech Ae)	2016-present		
Karena Cai (Caltech CDS)	(co-advised with R.M. Murray)		
Kai Matsuka (Caltech Ae)	2017-present		
Michael O'Connell (Caltech Ae)	2017-present		
Hiroyasu Tsukamoto (Caltech Ae)	2017-present		
Benjamin P. Riviere (Caltech Ae)	2018-present		
Ellande Tang (Caltech MCE)	2018- present (co- advised with M. Gharib)		
Guanya Shi (Caltech CDS)	2018- present (co- advised with Y. Yue)		
SooJean Han (Caltech CDS)	2018- present (co- advised with J. Doyle)		
Connor Lee (Caltech Ae)	2019-present		
E. Sorina Lupu (Caltech Ae)	2019-present		
Nikhil Ranganathan (Caltech Ae)	2020-present		

Student Name	Year Graduated	Ph.D. Thesis Title	Placement
James F. Ragan (Caltech Ae)	2020-present		

b. M.S. Thesis Students (graduated 11 MS thesis students at UIUC and 3 MS visiting students)

Student Name	Year Graduated	Thesis Title	Placement
Daniel Morgan	8/2011	Swarm Keeping Strategies for Spacecraft under J2 and Atmospheric Drag Perturbations	Continuing as PhD Student at UIUC
P. Daniel Kuang	12/2011	Robobat: Dynamics and Control of Flapping Flight Micro Aerial Vehicles	Control Engineer, Cummins, Inc.
Jinyu Guan	5/2012	Design and Control Strategy of a Flexible, Hyper-Redundant Robotic Arm Using Electroactive Dielectric Polymers	GNC Systems Engineer, Lockheed Martin
Dushyant Rao, co-advised with S. Hutchinson	8/2012	CurveSLAM: Utilizing Higher Level Structure in Stereo Vision-based Navigation	PhD Student, University of Sydney. Postdoc at University of Oxford
Nitish Sanghi (ME)	5/2013	Design of Flexible Actuators using Electro-Active Polymers and CPG-based Control Strategies	Mechanical Engineer, Intuitive Surgical Inc. (da Vinci Robots)
Giri Prashant Subramanian	8/2015	Nonlinear Control Strategies for Quadrotors and CubeSats	MS student in Computer Science, UIUC
Yashwanth Kumar Nakka (co-advised with J. Allison)	8/2016	Nonlinear Attitude Control of Spacecraft with Strain-Actuated Solar Arrays	PhD student at Caltech
Mingyo Seo (ME), co-advised with S. Hutchinson	8/2016	Application of a Model-Based Nonlinear Attitude Control for Quadrotor UAVs	Korea Institute of Science and Technology (KIST)
Lingyu Ma, co-advised with S, Hutchinson	12/2016	Monocular Vision Based Navigation Using Image Moments of Polygonal Features	Computer Vision Engineer at Caterpillar
Ayush Saxena	12/2017	Dynamic modeling of a robotic spacecraft for NASA's asteroid redirect robotic mission	Tesla
Martin Miller (ECE), co-advised with S. Hutchinson	12/2017	Hardware and Software Considerations for Monocular SLAM in A Riverine Environment	Ford Autonomous Vehicle Group
Francesca Baldini	7/2016	Visiting MS student under my supervision, the University of Pisa, Italy	PhD student at Caltech

Student Name	Year Graduated	Thesis Title	Placement
Giusy Falcone	7/2016	Visiting MS student under my supervision, the University of Pisa, Italy	PhD student at UIUC
Elena Sorina Lupu	4/2018	Visiting MS student under my supervision, EPFL, Switzerland	Research Staff at Caltech

c. Post-doctoral Associates (18 postdocs, including 6 current postdocs at Caltech)

Name	Title (percent time)	Permanent Employer	Years
Dr. Keehong Seo	Postdoctoral Associate (100%)	Research Staff Member at Samsung Advanced Institute of Technology	2008-2009
Dr. Animesh Chakravarthy	Postdoctoral Research Scientist at U of Florida/REEF with Subcontract from UIUC (50%)	Assistant Professor in Aerospace Engineering, Wichita State University	2009-2010
Dr. Ashwin Dani	Postdoctoral Associate (100%) co-advised with S. Hutchinson	Assistant Professor of Electrical and Computer Engineering, University of Connecticut	8/2011-8/2013
Dr. Aditya Paranjape	Postdoctoral associate (100%)	Assistant Professor (Lecturer) of Aeronautical Engineering, Imperial College London (Previously, Assistant Professor, McGill Univ.)	1/2012-11/2013
Dr. Jingjin Yu	Postdoctoral Associate (100%) co-advised with P. Voulgaris	Assistant Professor , Department of Computer Science, Rutgers University	3/2013-8/2013
Dr. Alireza Ramezani	Postdoctoral Associate (100%) co-advised with S. Hutchinson	Moved to Caltech	(11/2014-8/2017)
Dr. Christian Miguel Chilan	Postdoctoral Associate (100%)	University of Illinois	3/2015-7/2016
Dr. Saptarshi Bandyopadhyay	Postdoctoral Associate (100%)	Robotics Technologist at JPL	1/2016-6/2016
Dr. Ryan Shahrouz Alimo	Postdoctoral Associate (100%) at Caltech	AI Researcher at JPL	9/2017-12/2017
Dr. Alireza Ramezani	Postdoctoral Associate (100%) at Caltech	Assistant Professor of ECE, Northeastern University	8/2017-8/2018
Dr. Kyunam Kim	Postdoctoral Associate (100%) at Caltech		2017-present
Dr. Salar Rahili	Postdoctoral Associate (100%) at Caltech	Machine learning Engineer at Bay Area Startup	2017-7/2018

Name	Title (percent time)	Permanent Employer	Years
Dr. Vincenzo Capuano	Postdoctoral Associate (100%) at Caltech		2018-present
Sorina Lupu	Research Engineer		
Thayjes Srivas	Research Engineer		1/2018-12/2018
Alexei Harvard	Research Engineer		2018-present
Dr. Anthony Fragoso	Research Scientist		12/2018-present
Dr. Matt Anderson	Postdoctoral Associate		10/2019-present
Dr. Wolfgang Hoenig	Postdoctoral Associate		3/2019-present
Patrick Spieler	Research Engineer and Lead		2018-present
Dr. Serin Lee	Research Engineer		10/2019-present

d. Final PhD Exams and Undergraduate Advising

Final PhD Exams: 2 PhD students at Iowa State, 12 PhD students at UIUC, and 7 PhD students at Caltech. 11 Caltech PhD Students for PhD Candidacy Exams

Academic Advising: ~ 10 students per year at UIUC and ~12 undergraduates per year at Caltech

Caltech Summer Undergraduate Research Fellowship (SURF): 8 Caltech students in 2017 and 13 Caltech students in 2018.

Student Organizations/Design Teams

1. Faculty advisor (AIAA student chapter) since 2019
2. Caltech Drone Club (Faculty Advisor) since 2018.
3. Faculty advisor: NASA Lunar Robotics Competition: Illini Robotics in Space (IRIS) 2009-2015. Roughly 20 students in AE.
4. Faculty advisor: UAS Vision Tracking Challenge 2011-2014 (with S. Hutchinson). Roughly 20 students in AE and ECE
5. Faculty Advisor: Student Aircraft Builders 2013-Present. Roughly 25 students in AE and ME.
6. Faculty advisor: Float'n Illini: University of Illinois NASA Microgravity Team (2010-2011)
7. Faculty advisor: Iowa State University Team for the Mars Society University Rover Challenge (Iowa State) 2008, 2009