

Ricardo G. Sanfelice

Professor

Department of Electrical and Computer Engineering

University of California Santa Cruz

1156 High Street MS:SOE3

Santa Cruz, CA 95064

Email: ricardo@ucsc.edu

Urls: <https://hybrid.soe.ucsc.edu>

<https://cps.ucsc.edu>

Short Bio:

Ricardo G. Sanfelice received the B.S. degree in Electronics Engineering from the Universidad de Mar del Plata, Buenos Aires, Argentina, in 2001, and the M.S. and Ph.D. degrees in Electrical and Computer Engineering from the University of California, Santa Barbara, CA, USA, in 2004 and 2007, respectively. In 2007 and 2008, he held postdoctoral positions at the Laboratory for Information and Decision Systems at the Massachusetts Institute of Technology and at the Centre Automatique et Systèmes at the École de Mines de Paris. In 2009, he joined the faculty of the Department of Aerospace and Mechanical Engineering at the University of Arizona, Tucson, AZ, USA, where he was an Assistant Professor. In 2014, he joined the University of California, Santa Cruz, CA, USA, where he is currently Professor of Electrical and Computer Engineering. Prof. Sanfelice is the recipient of the 2013 SIAM Control and Systems Theory Prize, the National Science Foundation CAREER award, the Air Force Young Investigator Research Award, and the 2010 IEEE Control Systems Magazine Outstanding Paper Award. He is a Senior Member of the IEEE, Chair of the Technical Committee on Hybrid Systems in the Control Systems Society at IEEE, and Associate Editor for *Automatica*. Currently, he serves as Director of the Cyber-Physical Systems Research Center at the University of California, Santa Cruz. He was an Air Force Summer Faculty Fellow in 2010 and 2011. His research interests are in modeling, stability, robust control, observer design, and simulation of nonlinear and hybrid systems with applications to power systems, aerospace, and biology.

Research Interests:

Modeling, stability, robust control, observer design, and simulation of nonlinear and hybrid systems with applications to power systems, robotics, aerospace, and biology.

1 Education

Ph.D., Electrical and Computer Engineering

University of California, Santa Barbara. Spring 2007.

Dissertation Title: “Robust hybrid control systems.”

M.S., Electrical and Computer Engineering

University of California, Santa Barbara. Winter 2004.

B.S., Electronic Engineering

Universidad de Mar del Plata, Buenos Aires, Argentina. Fall 2001.

Thesis Title: “Novel current control method for AC induction motors.”

2 Professional Positions

Director

Cyber-Physical Systems Research Center, University of California Santa Cruz, Department of Computer Engineering, Santa Cruz, California. August 2017-present.

Professor

University of California Santa Cruz, Department of Electrical and Computer Engineering, Santa Cruz, California. July 2018-present.

Graduate Director

University of California Santa Cruz, Department of Electrical and Computer Engineering, Santa Cruz, California. Fall 2018-present.

Associate Professor

University of California Santa Cruz, Department of Computer Engineering, Santa Cruz, California. May 2014-June 2018.

Assistant Professor

University of Arizona, Department of Aerospace and Mechanical Engineering, Department of Electrical and Computer Engineering, Tucson, Arizona. Affiliate Member at the Program in Applied Mathematics, University of Arizona, Tucson, Arizona. January 2009-May 2014.

Postdoctoral

Centre Automatique et Systèmes, Ecole des Mines de Paris, Paris, France. September-December 2008.

Laboratory for Information and Decision Systems, Massachusetts Institute of Technology, Cambridge, Massachusetts. August 2007 to August 2008.

Graduate

Center for Control, Dynamical Systems, and Computation, University of California, Santa Barbara. September 2002 to July 2007.

Undergraduate

Laboratory of Instrumentation and Control, University of Mar del Plata, Buenos Aires, Argentina. March 1998 to December 2002.

Electronics Technician

Enelec S.A., Mar del Plata, Buenos Aires, Argentina. January 1997 to February 2002.

3 Honors

Best Student Paper Award Finalist (as advisor), American Control Conference, 2014.

Crown College Fellow, University of California, Santa Cruz, 2014.

Senior Capstone Design Competitions Award (as advisor) “Avilés Best Project That Exemplifies the Innate Art and Beauty of Engineering”, University of Arizona, 2014.

[SIAM Control and Systems Theory Prize](#) (SIAM), 2013.

“For contributions to analysis and syntheses of hybrid feedback control systems.”

Senior Capstone Design Competitions Award (as advisor) “Best Honeywell Engineering Design”, University of Arizona, 2013.

Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), 2013.

[Faculty Early Career Development \(CAREER\) Award](#), National Science Foundation, 2012.

[Air Force Office of Scientific Research Young Investigator Award \(YIP\)](#), AFOSR, 2012.

[Educator of the Year for Higher Education](#), Society of Hispanic Professional Engineers, 2012.
In recognition of outstanding contributions to the education of Latinos in Science and Eng.

Plenary Speaker, Society of Hispanic Professional Engineers National Conference, 2012.

Teaching Excellence Award, University of Arizona, Tucson, AZ, 2012.

ASEE Air Force Summer Faculty Fellow, 2011.

Plenary Speaker, [DYSCO Network Study Days](#), Liege, Belgium, 2011.

IEEE Control Systems Magazine Outstanding Paper Award, IEEE, 2010.

ASEE Air Force Summer Faculty Fellow, 2010.

Teaching Excellence Award, University of Arizona, Tucson, AZ, 2010.

Faculty Small Grants, Office of Vice President for Research, University of Arizona, Tucson, AZ, 2009.

Best Paper of Session Award, American Automatic Control Council, Minneapolis, MN, 2006.

President's Work-Study Award, University of California, Santa Barbara, 2003-2004.

Highest GPA of the Year Award, University of Mar del Plata, Argentina, 2001.

CONICET Research Scholarship, University of Mar del Plata, Argentina, 2000-2001.

4 Teaching Experience

Instructor. Graduate Course: "Introduction to Feedback Control Systems" Department of Electrical and Computer Engineering, University of California, Santa Cruz. Fall 2018.

Instructor. Graduate Course: "Hybrid Control" University of Bologna, Italy. May 14 - June 12, 2018.

Instructor. MOOC Course: "Cyber-Physical Systems: Modeling and Simulation" Coursera, Department of Computer Engineering, University of California, Santa Cruz. Fall 2017 - present. Online: <https://www.coursera.org/learn/cyber-physical-systems-1>

Instructor. Undergraduate Course: "Robot Automation" Department of Computer Engineering, University of California, Santa Cruz. Fall 2017.

Instructor. Graduate Course: "Introduction to Feedback Control Systems" Department of Computer Engineering, University of California, Santa Cruz. Fall 2017.

Instructor. Undergraduate/Graduate Course: "Introduction to Cyber-Physical Systems." Department of Computer Engineering, University of California, Santa Cruz. Winter 2017.

Instructor. Graduate Course: "Analysis and Design of Hybrid Control Systems." 2017 IGSC/EECI Graduate School on Control, CNRS, Laboratoire des Signaux et Systemes (IN-SIS & INS2I) & European Embedded Control Institute (EECI), SUPELEC, Gif-sur-Yvette, France, March 20-24 (21 hours of teaching), 2017.

Lecturer. Workshop: "Feedback Control of Hybrid Systems." IEEE Decision and Control Conference, Las Vegas. December 2016.

Instructor. Undergraduate Course: "Robot Automation" Department of Computer Engineering, University of California, Santa Cruz. Fall 2016.

Instructor. Graduate Course: “Hybrid Dynamical Systems.” Department of Computer Engineering, University of California, Santa Cruz. Spring 2016.

Lecturer. Tutorial: “Control Theoretical Tools for Analysis and Design of Cyber-Physical Systems.” CPSWeek 2016, Vienna, Austria. April 11, 2016.

Instructor. Undergraduate/Graduate Course: “Introduction to Cyber-Physical Systems.” Department of Computer Engineering, University of California, Santa Cruz. Winter 2016.

Lecturer. DISC Summer School on “Control of Cyber-Physical Systems.” Centerparcs park Zandvoort, Zandvoort, The Netherlands, June 1-4, 2015.

Instructor. Graduate Course: “Hybrid Dynamical Systems.” Department of Computer Engineering, University of California, Santa Cruz. Winter 2015.

Instructor. Graduate Course: “Analysis and Design of Hybrid Control Systems.” 2015 IGSC/EECI Graduate School on Control, CNRS, Laboratoire des Signaux et Systemes (INSIS & INS2I) & European Embedded Control Institute (EECI), SUPELEC, Gif-sur-Yvette, France, May 18-22 (21 hours of teaching), 2015.

Instructor. Undergraduate Course: “Introduction to Cyber-Physical Systems.” Department of Computer Engineering, University of California, Santa Cruz. Fall 2014.

Instructor. Graduate Course: “Analysis and Design of Hybrid Control Systems.” 2014 EECI Graduate School on Control, CNRS, Laboratoire des Signaux et Systemes (INSIS & INS2I) & European Embedded Control Institute (EECI), SUPELEC, Gif-sur-Yvette, France, May 5-9 (21 hours of teaching), 2014.

Instructor. Graduate Course: “Robust Hybrid Control Systems.” Instituto Tecnológico Buenos Aires (ITBA), Buenos Aires, Argentina, October 21-25 (21 hours of teaching), 2013.

Instructor. Graduate Course: “Robust Hybrid Control Systems.” 2013 EECI Graduate School on Control, CNRS, Laboratoire des Signaux et Systemes (INSIS & INS2I) & European Embedded Control Institute (EECI), SUPELEC, Gif-sur-Yvette, France, May 20-24 (21 hours of teaching), 2013.

Instructor. Graduate Course: “Robust Hybrid Control Systems.” 2011 EECI Graduate School on Control, CNRS, Laboratoire des Signaux et Systemes (INSIS & INS2I) & European Embedded Control Institute (EECI), SUPELEC, Gif-sur-Yvette, France, May 2-5 (21 hours of teaching), 2011.

Instructor. Graduate Course: “Introduction to Advanced Control Theory.” Department of Aerospace and Mechanical Engineering, University of Arizona. Fall 2012.

Instructor. Undergraduate Course: “Stability and Control of Space Vehicles.” Department of Aerospace and Mechanical Engineering, University of Arizona. Fall 2010, Fall 2011, Fall 2012, and Fall 2013.

Instructor. Graduate Course: “Hybrid Control Systems.” Department of Aerospace and Mechanical Engineering, University of Arizona. Fall 2009, Fall 2011, and Fall 2013.

Instructor. Undergraduate Course: “Control System Design.” Department of Aerospace and Mechanical Engineering, University of Arizona. Spring 2009, Spring 2010, Spring 2011, and Spring 2012.

Lecturer. Workshop: “Robust Hybrid Control Systems.” 50th Joint Conference on Decision and Control and European Control Conference, Orlando. December 2011.

Lecturer. Workshop: “Robust Hybrid Control Systems.” October 2008. Centre Automatique et Systèmes, Ecole des Mines de Paris, Paris, France.

Lecturer. Workshop: “Robust Hybrid Control Systems.” November 2008. University of Rome, Tor Vergata, Rome, Italy.

Lecturer. Workshop: “Robust Hybrid Control Systems.” 27th American Control Conference, Seattle. June 2008.

Lecturer. Mini-workshop: “Robust Hybrid Control Systems and Applications.” Fall 2007. Laboratory for Information and Decision Systems. Massachusetts Institute of Technology.

Lecturer and grader. Graduate Course: “Robust Hybrid Control Systems.” Department of Electrical and Computer Engineering. University of California, Santa Barbara. Spring 2007.

Lecturer. Workshop: “Robust Hybrid Systems: Theory and Applications.” 45th IEEE Conference on Decision and Control, San Diego. December 2006.

Teaching assistant. Undergraduate Courses: “Nonlinear Phenomena and Chaos,” Spring 2003; “Digital control systems”, Winter 2003; “Control systems”, Fall 2002. Department of Electrical and Computer Engineering. University of California, Santa Barbara.

Teaching assistant. Undergraduate Course: “Statistics.” University of Mar del Plata, Buenos Aires, Argentina. 2001.

5 Professional Memberships

Institute of Electrical and Electronics Engineers (IEEE).

Society for Industrial and Applied Mathematics (SIAM).

6 Research Projects

Projects as Single/Lead PI:

National Science Foundation, *Hybrid Predictive Control for Distributed Multi-agent Systems*. Aug 1, 2017 - Jul 31, 2020.

CITRIS, *Hybrid Algorithms For Real-Time Identification And Manipulation Of Deformable Soft Tissues*. July 1, 2017 - June 30, 2018.

National Science Foundation, *Collaborative Research: Computationally Aware Cyber-Physical Systems*. Oct 1, 2015 - Sep 30, 2018.

Air Force Office of Scientific Research, *Reconfigurable Algorithms for High Performance and Robust Autonomy in Complex Networks*. Sep 1, 2015 - Aug 31, 2018.

Air Force Research Laboratory, *Game-theoretical Tools for the Design of Decentralized Control Algorithms for Hybrid Systems with Uncertainty*. Apr 15, 2016 - Apr 14, 2018.

National Science Foundation, Faculty Early Development Award, *CAREER: Enabling Design of Future Smart Grids via Input/Output Hybrid Systems Tools*. Mar 1, 2012 - Feb 28, 2018.

Center for Research on Open Source Systems (CROSS), *A Data-Driven Open Source Software for Enabling Safe and Efficient Navigation of Autonomous Vehicles*. Apr 1 2016 - March 31 2018.

UCSC Silicon Valley Initiatives Research Award, *Distributed Hybrid Control Algorithms for Robust Integration of UAS in the NAS: Theory and Experiments*. Jan 1 - Dec 31, 2015.

Air Force Office of Scientific Research, Young Investigator Program, *Robust Feedback Control of Reconfigurable Multi-agent Systems in Uncertain Adversarial Environments*. Jul 1, 2012 - Jun 30, 2015.

Honeywell, *Robust Decision-making Control for Autonomous Recovery of Aerospace Vehicles under Sensor Limitations and Failures*. May 13, 2012 - May 11, 2013.

Connection One (NSF Center), *Hybrid Control of High-Speed Unmanned Surface Vessels for Oceanic and Atmospheric Research*. Nov 28, 2012 - Jun 1, 2014.

Mathworks, *Attitude Control for Optimal Generation of Energy from Multiple Energy Sources*. Jul 1, 2011 - Jun 20, 2012.

National Science Foundation, *Workshop: 1st Southwest Workshop on Theory and Applications of Cyber-physical Systems*. Aug 1 2010 - Jul 31, 2011.

The Center for Insect Science, Department of Neuroscience, The University of Arizona, *Multidisciplinary Studies of Insect Flight to Develop Building Penetration Systems*. Jun 1, 2010 - May 31, 2011.

UA Vice President for Research, *Robust Coordinated Control of Groups of Heterogeneous Autonomous Vehicles*. May 18, 2009 - May 17, 2011.

Projects as co-PI:

CITRIS, *Cloud-based Anytime Computation of Reachable Tubes for Provably Safe Unmanned Aerial Systems Traffic Management*. Mar 1, 2018 - Feb 28, 2019.

Air Force Research Laboratory, *Assured Autonomous Spacecraft GN&C via Hybrid Control (SBIR)*. Fall 2017 - December 2017.

CITRIS, *Secure Algorithms for Cloud-Connected Autonomous Robots Interacting with Humans*. Mar 30, 2016 - Mar 29, 2018.

AFRL (STTR), *Cognitive Radio Spectrum Management and Waveform Adaptation for High-capacity Satellite Communications*. Phase I. Mar 1, 2012 - Feb 28, 2013.

The Center for Insect Science, Department of Neuroscience, The University of Arizona, *Dynamical Modeling and Analysis of Olfactory Decision-making Circuit in *Manduca sexta* for Control of Autonomous Aerial Vehicles*. Nov 2010 - Oct 2011.

7 Publications

Last updated on April 2018. Up-to-date publication list including hyperlinks is available at <https://hybrid.soe.ucsc.edu/biblio>

7.1 Books

- [1] R. Goebel, R. G. Sanfelice, and A. R. Teel. *Hybrid Dynamical Systems: Modeling, Stability, and Robustness*. Princeton University Press, New Jersey, 2012. <http://press.princeton.edu/titles/9759.html>

7.2 Book Chapters

- [2] R. G. Sanfelice. Robust distributed estimation and synchronization for linear systems with limited information. To appear in Springer LNCIS volume “Control subject to Computational and Communication Constraints: Current Challenges”, 2017.
- [3] R. G. Sanfelice. Hybrid predictive control. To appear in Handbook of Model Predictive Control, Birkhauser, 2017.
- [4] Y. Li and R. G. Sanfelice. *Incremental Graphical Asymptotic Stability for Hybrid Dynamical Systems*. Springer, Volume 473 of the series Lecture Notes in Control and Information Sciences, pp. 231-262, 2016.
- [5] R. G. Sanfelice. *Analysis and Design of Cyber-Physical Systems: A Hybrid Control Systems Approach*. Cyber Physical Systems: From Theory to Practice: CRC Press, page 3–31, 2015.
- [6] R. G. Sanfelice. *Feedback Control of Hybrid Dynamical Systems*. Encyclopedia of Systems and Control: Springer, 2015.
- [7] R. G. Sanfelice. *Control of Hybrid Dynamical Systems: An Overview of Recent Advances*, pages 146–177. Wiley, April 2013.
- [8] A. R. Teel, R. G. Sanfelice, and R. Goebel. *Hybrid Control Systems*. Springer, 2009.
- [9] C. Cai, R. Goebel, R. G. Sanfelice, and A. R. Teel. *Hybrid systems: limit sets and zero dynamics with a view toward output regulation*, chapter Hybrid systems: limit sets and zero dynamics with a view toward output regulation, pages 241–261. Springer-Verlag, 2008.

7.3 Thesis and Dissertations

- [10] R. G. Sanfelice. Robust hybrid control systems. Ph.D. Dissertation, University of California, Santa Barbara, 2007.
- [11] R. G. Sanfelice. Novel current control for AC motors. B.S. Thesis, Universidad Nacional de Mar del Plata, 2001.

7.4 Journal Articles

- [12] S. Phillips and R. G. Sanfelice. Robust distributed synchronization of networked linear systems with intermittent information. *To appear in Automatica*, 2019.
- [13] F. Ferrante, F. Gouaisbaut, R. G. Sanfelice, and S. Tarbouriech. \mathcal{L}_2 state estimation with guaranteed convergence speed in the presence of sporadic measurements. *To appear in IEEE Transactions on Automatic Control*, 2019.
- [14] Y. Li and R. G. Sanfelice. Finite time stability of sets for hybrid dynamical systems. *To appear in Automatica*, 2019.
- [15] J. Chai and R. G. Sanfelice. Forward invariance of sets for hybrid dynamical systems (Part I). *To appear in IEEE Transactions on Automatic Control*, 2018.
- [16] R. Goebel and R. G. Sanfelice. Pointwise asymptotic stability in a hybrid system and well-posed behavior beyond zeno. *SIAM Journal on Control and Optimization*, 56:1358–1385, 2018.
- [17] X. Lou, Y. Li, and R. G. Sanfelice. Robust stability of hybrid limit cycles with multiple jumps in hybrid dynamical systems. *IEEE Transactions on Automatic Control*, 63(4):1220–1226, 2018.
- [18] Y. Li, S. Phillips, and R. G. Sanfelice. Robust distributed estimation for linear systems under intermittent information. *IEEE Transactions on Automatic Control*, 63(4):973–988, 2018.
- [19] D. W. Smith and R. G. Sanfelice. A hybrid control strategy for waypoint transition and loitering of unmanned aerial vehicles. *Nonlinear Analysis: Hybrid Systems*, 26:115–136, 2017.
- [20] P. Casau, R. G. Sanfelice, and C. Silvestre. Hybrid stabilization of linear systems with reverse polytopic input constraints. *IEEE Transactions on Automatic Control*, 2017.
- [21] R. Naldi, M. Furci, R. G. Sanfelice, and L. Marconi. Robust global trajectory tracking for underactuated VTOL aerial vehicles using inner-outer loop control paradigms. *IEEE Transactions on Automatic Control*, 62(1):97–112, January 2017.
- [22] P. Nanez, R. G. Sanfelice, and N. Quijano. On an invariance principle for differential-algebraic equations with jumps and its application to switched differential-algebraic equations. *Mathematics of Control Signal and Systems*, 185, 2017.
- [23] D. A. Copp and R. G. Sanfelice. A zero-crossing detection algorithm for robust simulation of hybrid systems jumping on surfaces. *Simulation Modelling Practice and Theory*, 68:1–17, November 2016.
- [24] K. Zhang, J. Sprinkle, and R. G. Sanfelice. Computationally-aware switching criteria for hybrid model predictive control of cyber-physical systems. *IEEE Transactions on Automation Science and Engineering*, 13:479–490, 2016.

- [25] J. J. B. Biemond, W. P. M. H. Heemels, R. G. Sanfelice, and N. van de Wouw. Distance function design and lyapunov techniques for the stability of hybrid trajectories. *Automatica*, 73:38–46, November 2016.
- [26] F. Ferrante, F. Gouaisbaut, R. G. Sanfelice, and S. Tarbouriech. State estimation of linear systems in the presence of sporadic measurements. *Automatica*, 73:101–109, November 2016.
- [27] Y. Li, S. Phillips, and R. G. Sanfelice. Basic properties and characterizations of incremental stability prioritizing flow time for a class of hybrid systems. *Systems and Control Letters*, 90:7–15, April 2016.
- [28] R. G. Sanfelice and L. Praly. Convergence of nonlinear observers on \mathbb{R}^n with a riemannian metric (part ii). *IEEE Transactions on Automatic Control*, 61(10):2848–2860, October 2016.
- [29] K. Zhang, J. Sprinkle, and R. G. Sanfelice. Computationally-aware control of autonomous vehicles: A hybrid model predictive control approach. *Autonomous Robots*, 39:503–517, December 2015.
- [30] Y. Li and R. G. Sanfelice. Interconnected observers for linear systems to improve rate of convergence and robustness to measurement noise. *IEEE Transactions on Control of Network Systems*, 3:1–11, 2016.
- [31] P. Casau, R. G. Sanfelice, R. Cunha, D. Cabecinhas, and C. Silvestre. Robust global trajectory tracking for a class of underactuated vehicles. *Automatica*, 58:90–98, August 2015.
- [32] S. Phillips and R. G. Sanfelice. Robust asymptotic stability of desynchronization in impulse-coupled oscillators. *IEEE Transactions on Control of Network Systems*, 3:127–136, June 2016.
- [33] Y. Li and R. G. Sanfelice. A finite-time convergent observer with robustness to piecewise-constant measurement noise. *Automatica*, 57:222–230, July 2015.
- [34] T. A. F. Theunisse, J. Chai, R. G. Sanfelice, and M. Heemels. Robust global stabilization of the DC-DC boost converter via hybrid control. *IEEE Transactions on Circuits and Systems I*, 62:1052–1061, April 2015.
- [35] P. Casau, R. G. Sanfelice, R. Cunha, and C. Silvestre. A globally asymptotically stabilizing trajectory tracking controller for rigid bodies using only landmark-based information. *International Journal of Robust and Nonlinear Control*, 25:3617–3640, 2015.
- [36] D. Tolic, R. G. Sanfelice, and R. Fierro. Input-output triggered control using lp stability over finite horizons. *International Journal of Robust and Nonlinear Control*, pages 2299–2327, June 2015.

- [37] R. G. Sanfelice. Input-output-to-state stability tools for hybrid systems and their interconnections. *IEEE Transactions on Automatic Control*, 59(5):1360–1366, May 2014.
- [38] Q. Shu and R. G. Sanfelice. Dynamical properties of a two-gene network with hysteresis. *Special Issue on Hybrid Systems and Biology, Elsevier Information and Computation*, 236:102–121, August 2014.
- [39] R. G. Sanfelice, S. Z. Yong, and E. Frazzoli. On minimum-time paths of bounded curvature with position-dependent constraints. *Automatica*, 50(2):537–546, February 2014.
- [40] R. G. Sanfelice. On the existence of control Lyapunov functions and state-feedback laws for hybrid systems. *IEEE Transactions on Automatic Control*, 58(12):3242–3248, December 2013.
- [41] R. G. Sanfelice and C. Prieur. Robust supervisory control for uniting two output-feedback hybrid controllers with different objectives. *Automatica*, 49(7):1958–1969, July 2013.
- [42] R. Naldi and R. G. Sanfelice. Passivity-based control for hybrid systems with applications to mechanical systems exhibiting impacts. *Automatica*, 49(5):1104–1116, May 2013.
- [43] C. G. Mayhew, R. G. Sanfelice, and A. R. Teel. On path-lifting mechanisms and unwinding in quaternion-based attitude control. *IEEE Transactions on Automatic Control*, 58(5):1179–1191, May 2013.
- [44] R. G. Sanfelice, J. J. B. Biemond, N. van de Wouw, and W. P. M. H. Heemels. An embedding approach for the design of state-feedback tracking controllers for references with jumps. *International Journal of Robust and Nonlinear Control*, 24(11):1585–1608, 2013.
- [45] C. G. Mayhew, R. G. Sanfelice, J. Sheng, M. Arcak, and A. R. Teel. Quaternion-based hybrid feedback for robust global attitude synchronization. *IEEE Transactions on Automatic Control*, 57(8):2122–2127, August 2012.
- [46] R. G. Sanfelice and L. Praly. Convergence of nonlinear observers on \mathbb{R}^n with a Riemannian metric (Part I). *IEEE Transactions on Automatic Control*, 57(7):1709–1722, July 2012. <http://arxiv.org/abs/1412.6730>; <http://arxiv.org/abs/1412.6730>.
- [47] R. G. Sanfelice and L. Praly. On the performance of high-gain observers with sign-indefinite gain adaptation under measurement noise. *Automatica*, 47(10):2165–2176, October 2011.
- [48] R. G. Sanfelice. Interconnections of hybrid systems: Some challenges and recent results. *Journal of Nonlinear Systems and Applications*, 2(1-2):111–121, 2011.

- [49] C. G. Mayhew, R. G. Sanfelice, and A. R. Teel. Quaternion-based hybrid controller for robust global attitude tracking. *IEEE Transactions on Automatic Control*, 56(11):2555–2566, November 2011.
- [50] R. G. Sanfelice and A. R. Teel. On singular perturbations due to fast actuators in hybrid control systems. *Automatica*, 47(4):692–701, April 2011.
- [51] R. G. Sanfelice and A. R. Teel. Dynamical properties of hybrid systems simulators. *Automatica*, 46(2):239–248, 2010.
- [52] R. G. Sanfelice and A. R. Teel. Asymptotic stability in hybrid systems via nested Matrosov functions. *IEEE Transactions on Automatic Control*, 54(7):1569–1574, 2009.
- [53] R. Goebel, R. G. Sanfelice, and A.R. Teel. Hybrid dynamical systems. *IEEE Control Systems Magazine*, 29(2):28–93, April 2009.
- [54] R. G. Sanfelice, R. Goebel, and A.R. Teel. Generalized solutions to hybrid dynamical systems. *ESAIM: Control, Optimisation and Calculus of Variations*, 14(4):699–724, 2008.
- [55] R. Goebel, R. G. Sanfelice, and A. R. Teel. Invariance principles for switching systems via hybrid systems techniques. *Systems & Control Letters*, 57(12):980–986, December 2008.
- [56] R. G. Sanfelice, R. Goebel, and A. R. Teel. Invariance principles for hybrid systems with connections to detectability and asymptotic stability. *IEEE Transactions on Automatic Control*, 52(12):2282–2297, 2007.

7.5 Peer-reviewed Conference Articles in Proceedings

- [57] M. Guarro, F. Ferrante, and R. G. Sanfelice. State estimation of linear systems over a network subject to sporadic measurements and time-delays. In *Proceedings of the IFAC Workshop on Distributed Estimation and Control of Networked Systems*, pages 313–318, 2018.
- [58] H. Han and R. G. Sanfelice. A hybrid control algorithm for object grasping using multiple agents. In *Proceedings of the Conference on Control Technology and Applications*, NULL, pages 652–657, 2018.
- [59] D. Lavell, S. Phillips, and R. G. Sanfelice. A hybrid PID design for asymptotic stabilization with intermittent measurements. In *To appear in 2018 IEEE Conference on Decision and Control*, 2018.
- [60] M. Maghenem and R. G. Sanfelice. Barrier function certificates for invariance in hybrid inclusions. In *To appear in 2018 IEEE Conference on Decision and Control*, 2018.

- [61] P. Bernard and R. G. Sanfelice. Observers for hybrid systems with linear flow/jump maps and known jump times. In *To appear in 2018 IEEE Conference on Decision and Control*, 2018.
- [62] F. Ferrante and R. G. Sanfelice. Cost evaluation for hybrid inclusions: A Lyapunov approach. In *To appear in 2018 IEEE Conference on Decision and Control*, 2018.
- [63] R. Goebel and R. G. Sanfelice. A unifying convex analysis and switching system approach to consensus with undirected communication graphs. In *To appear in 2018 IEEE Conference on Decision and Control*, 2018.
- [64] B. Altin, P. Ojaghi, and R. G. Sanfelice. A model predictive control framework for hybrid systems. In *NMPC*, 2018.
- [65] H. Han and R. G. Sanfelice. Sufficient conditions for temporal logic specifications in hybrid dynamical systems. *To appear in IFAC Conference on Analysis and Design of Hybrid Systems*, 2018.
- [66] B. P. Malladi, E. Butcher, and R. G. Sanfelice. Robust hybrid global asymptotic stabilization of rigid body dynamics using dual quaternions. In *2018 AIAA SciTech Forum*, 2018.
- [67] G. Zucchini, B. P. Malladi, R. G. Sanfelice, and E. Butcher. Robust hybrid supervisory control for a 3-dof spacecraft in close-proximity operations. *To appear in Networked & Autonomous Air & Space Systems*, 2018.
- [68] J. R. Crane, C. W. T. Roscoe, B. P. Malladi, G. Zucchini, E. Butcher, R. G. Sanfelice, and I. Hussein. Hybrid control for autonomous spacecraft rendezvous proximity operations and docking. *To appear in Networked & Autonomous Air & Space Systems*, 2018.
- [69] B. Short and R. G. Sanfelice. A hybrid predictive control approach to trajectory tracking for a fully actuated biped. *To appear in American Control Conference*, 2018.
- [70] B. Altin and R. G. Sanfelice. Model predictive control under intermittent measurements due to computational constraints: Feasibility, stability, and robustness. *To appear in American Control Conference*, 2018.
- [71] B. Altin and R. G. Sanfelice. On robustness of pre-asymptotic stability to delayed jumps in hybrid systems. *To appear in American Control Conference*, 2018.
- [72] B. P. Malladi, R. G. Sanfelice, and E. Butcher. Robust hybrid kalman filter for a class of nonlinear systems. *To appear in American Control Conference*, 2018.
- [73] F. Ferrante and R. G. Sanfelice. On the value of the cost of optimal control problems for constrained difference inclusions. *To appear in American Control Conference*, 2018.

- [74] J. I. Poveda, M. Benosman, A. R. Teel, and R. G. Sanfelice. A hybrid adaptive feedback law for robust obstacle avoidance and coordination in multiple vehicle systems. *To appear in American Control Conference*, 2018.
- [75] S. Phillips, R. S. Erwin, and R. G. Sanfelice. Robust exponential stability of an intermittent transmission state estimation protocol. *To appear in American Control Conference*, 2018.
- [76] A. Duz, S. Phillips, A. Fagiolini, R. G. Sanfelice, and F. Pasqualetti. Stealthy attacks in cloud-connected (linear-impulsive) systems. *To appear in American Control Conference*, 2018.
- [77] F. Ferrante, R. G. Sanfelice, and S. Tarbouriech. Hybrid regional stabilization of linear systems with actuator saturation and multi-rate samplers. *To appear in European Control Conference*, 2018.
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- [195] N. Risso and R. G. Sanfelice. Tools for the study of stability and convergence in set dynamical systems with applications to feedback control. 2017.

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- [198] R. G. Sanfelice and G. H. Elkaim. A hybrid control strategy for autonomous navigation while avoiding multiple obstacles at unknown locations. 2018.
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- [205] P. Bernard and R. G. Sanfelice. An algorithm to generate solutions to hybrid dynamical systems with inputs and applications to series interconnections. 2018.
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- [208] R. G. Sanfelice, D. Copp, P. Nanez. HyEQ: A Toolbox for Simulation of Hybrid Dynamical Systems. Webinar, The Mathworks, 2013.
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8 Patents

- [1] A Robust Hybrid Control Algorithm for a Single-Phase DC/AC Inverter, University of California, Santa Cruz, California, USA. *US Patent 9876442B2*. Online: <https://patents.google.com/patent/US20160105128>.

9 Research Advising and Mentoring

Mentor of postdoctoral researchers. Mentor of graduate, undergraduate, and high school students, including students from underrepresented groups. Mentor of seven freshman students through the *Arizona Assurance Scholars Program*, which provides academic, financial and social support for low-income Arizona residents as a way to ensure success, retention and graduation from the University of Arizona (since 2009). See “Academic and Service Work” section.

Postdoctoral Researchers

Berk Altın, University of California, Santa Cruz. Fall 2016-present.

Mohamed Maghenem, University of California, Santa Cruz. Winter 2017-present.

Graduate Students

Santiago Jimenez Leudo, University of California, Santa Cruz. Fall 2018-present. Ph.D. Student.

Ryan Johnson, University of California, Santa Cruz. Fall 2018-present. Ph.D. Student.

Nan Wang, University of California, Santa Cruz. Fall 2018-present. Ph.D. Student.

Pegah Ojaghi, University of California, Santa Cruz. Fall 2017-present. Ph.D. Student.

Dawn Hustig-Schultz, University of California, Santa Cruz. Spring 2017-present. Ph.D. Student.

Marcello Guarro, University of California, Santa Cruz. Fall 2016-present. Ph.D. Student.

Yegeta Zeleke, University of California, Santa Cruz. Fall 2016-present. Ph.D. Student.

Brendan Short, University of California, Santa Cruz. Fall 2015-Summer 2018.
Graduated with M.S. thesis option.

Hyejin Han, University of California, Santa Cruz. Fall 2015-present. Ph.D. Student.

Ryan Rodriguez, University of California, Santa Cruz. Fall 2015-Spring 2017.

Nathalie Risso, University of Arizona. Fall 2013-present. Ph.D. Student.

Jun Chai, University of California, Santa Cruz. Fall 2012-Summer 2018. Graduated with Ph.D. (received M.S. on Spring 2014).

BharaniPrabha Malladi, University of Arizona. Summer 2012-present. Ph.D. Student.

Sean Phillips, University of California, Santa Cruz. Fall 2011-Fall 2017. Ph.D. Student (received M.S. on Fall 2013). Graduated with Ph.D.

Jeffrey Koessler, University of Arizona. Spring 2010-present. Summer 2011-Spring 2014. Ph.D. Student.

Pedro Casau, Instituto Superior Tecnolico, Lisbon, Portugal. Spring 2013-Winter 2017. Graduated with Ph.D.

Pablo Nanez, Universidad de los Andes. Fall 2011-Fall 2016. Graduated with Ph.D.

Yuchun Li, University of California, Santa Cruz. Fall 2010-Spring 2016. Graduated with Ph.D.

Adam Ames, University of California, Santa Cruz. Fall 2018-present. M.S. Student.

Jerry Chiang, University of California, Santa Cruz. Spring 2017-Spring 2018. M.S. Student.

Sumukh Atreya, University of California, Santa Cruz. Spring 2017-Winter 2018. Graduated with M.S. report option.

Daniel Lavell, University of California, Santa Cruz. Fall 2016-Winter 2018. Graduated with M.S. thesis option.

Kevin-Patxi Le Bras, University of California, Santa Cruz. Winter 2016-Summer 2017. Graduated with M.S. report option.

Alexander Jacobs, University of Arizona. Fall 2012-Spring 2013. Graduated with M.S. thesis option

Qin Shu, University of Arizona. Fall 2011-Summer 2012. Graduated with M.S. thesis option

Xiaolu Tian, University of Arizona. Spring 2011-Spring 2013.

Graduated with M.S. thesis option

Manuel Robles, SHPE member, University of Arizona. Fall 2010-Spring 2012.
Graduated with M.S. thesis option

Ryan Jones, University of Arizona. Spring 2012. M.S. Student.

Tom Cleary, University of Arizona. Spring 2010. M.S. Student.

Jennifer Champion, University of Arizona. Spring 2010-Fall 2010. M.S. Student.

Sertac Karaman, Massachusetts Institute of Technology. Summer 2007-Summer 2008. Ph.D. Student.

Rowland O'Flaherty, University of California, Santa Barbara. Fall 2006-Summer 2008. M.S. Student.

Undergraduate Students

Harsh Bhakta, University of California, Santa Cruz. Fall 2018-present.

Joshua Pena, University of California, Santa Cruz. Spring 2018.

Adam Ames, University of California, Santa Cruz. Fall 2017-Spring 2018.

Angela Rodriguez, University of California, Santa Cruz. Summer 2017-present.

Jeremy Crowley, University of California, Santa Cruz. Fall 2015-Summer 2018.

Calvin John, University of California, Santa Cruz. Winter 2016-Spring 2017.

Daniel Lavell, University of California, Santa Cruz. Fall 2014-Summer 2016.

David Ramirez, University of Arizona. Summer 2013-Spring 2014.

Robert Miller, University of Arizona. Spring 2013-Spring 2014.

Harrison Stovall, University of Arizona. Fall 2012-Spring 2014.

Colin Lasharr, University of Arizona. Fall 2012-Spring 2014.

Nicholas Valverde, University of Arizona. Fall 2011-Spring 2014.

Savannah Rodgers, University of Arizona. Spring 2013.

Ryan Dang, University of Arizona. Spring 2013.

Karl Stemm, University of Arizona. Fall 2011-Spring 2012.

Timothy Lomayesva, University of Arizona. Summer 2011.

Nikolas Kaplan, University of Arizona. Fall 2010-Summer 2012.

Eduardo Moreno, SHPE member, University of Arizona. Spring 2011-Fall 2011.

German Castillo, SHPE member, University of Arizona. Fall 2010-Spring 2011.

Sean Phillips, University of Arizona. Fall 2010-Spring 2011.

David Copp, University of Arizona. Fall 2010-Spring 2011.

Sergio Valenzuela, SHPE member, University of Arizona. Fall 2009.

Manuel Robles, SHPE member, University of Arizona. Fall 2009.

Ryan Jones, University of Arizona. Fall 2009-Fall 2011.

Tom Cleary, University of Arizona. Spring 2009.

Justin Pearson, University of California, Santa Barbara. Summer 2006.

Jose Cornejo, INSET Program, University of California, Santa Barbara. Summer 2006.

Richard Quinto, RISE Program, University of California, Santa Barbara. Summer 2006.

High School Students

Thomas Pryor, Catalina Foothills High School. Summer 2013.

Paulina Solis, Latin America Summer Program. Summer 2013.

Thomas Pryor, Henry Lei, and David Odgen; Catalina Foothills High School. Summer 2012.

Jonathan Brubaker, Jorge Cardenas, Robert Codona, Dylan Kirk, Dianni Reyes, Ray Brown Jr., Dustin Head, and Jon Carson; Palo Verde Magnet High School. Fall 2011-Spring 2012.

Karl Stemm and Nicholas Valverde, Palo Verde Magnet High School. Summer 2010, Summer 2011.

Sahel Gomez, Latin America Summer Program. Summer 2011.

Irina Orlova and Chaunteal Rasmussen, Palo Verde Magnet High School. Summer 2010.

Monica Jacinto, Summer Sessions Research Mentorship Program, University of California, Santa Barbara. Summer 2005.

Mitch Forman, Summer Sessions Research Mentorship Program, University of California, Santa Barbara. Summer 2004.

10 Supervised Thesis and Dissertations

Supervised Ph.D. Dissertations

Jun Chai, University of California, Santa Cruz. Spring 2018. Title: Analysis and Control Design for Forward Invariance in Hybrid Systems.

Sean Phillips, University of California, Santa Cruz. Winter 2018. Title: Robust Coordinate and Control of Networked Ssystems with Intermittent Communication.

Pedro Casau, Instituto Superior Tecnolico, Lisbon, Portugal. Winter 2017. Title: Synergetic Hybrid Feedback Control with Application to Autonomous Air Vehicles.

Pablo Nanez, Universidad de los Andes, Colombia. Fall 2016. Title: Invariance Principles and Passivity Notions for Switched DAE and Hybrid DAE Systems.

Yuchun Li, University of California, Santa Cruz. Spring 2016. Title: Observers with Performance Guarantees and Robustness to Measurement Noise for Linear Systems.

Supervised M.S. Thesis

Daniel Lavell, M.S., University of California, Santa Cruz. Winter 2018. Title: A Hybrid PID Design for Asymptotic Stabilization with Intermittent Measurements.

Jun Chai, M.S., University of Arizona. Spring 2014. Title: Invariance Tools For Hybrid Dynamical Systems.

Sean Phillips, M.S., University of Arizona. Fall 2013. Title: Modeling and Analysis of Robust Stability for Spiking Neurons.

Alexander Jacobs, M.S., University of Arizona. Spring 2013. Title: Autonomous Aquatic Vessel for Weather Data Acquisition.

Xiaolu Tian, M.S., University of Arizona. Fall 2012. Title: Juggling on a Bouncing Ball Apparatus Via Hybrid Control.

Qin Shu, M.S., University of Arizona. Fall 2012. Title: Hybrid Systems for Genetic Regulatory Networks.

Manuel Robles, M.S., University of Arizona. Spring 2012. Title: Hybrid Tracking Control of Impulsive Reference Signals.

11 Invited Presentations

- [1] Research Review Talk. AFOSR Contractors Meeting, Washington DC, USA. September 27, 2018. Title: “Hybrid Control Algorithms for Estimation and Synchronization in Complex Networks.”
- [2] Research Overview Talk. CITRIS & ITESM Seed Funding Opportunities, Berkeley, CA, USA. September 6, 2018. Title: “Hybrid Algorithms for Real-time Identification and Manipulation of Deformable Soft Tissues.”
- [3] Invited Talk. American Control Conference (ACC), Milwaukee, WI, June 28, 2018. NSF CAREER Awardees Invited Session. Title: “An Overview of Recent Advances and Future Challenges in Hybrid Feedback Control Design.”
- [4] Invited Talk. CITRIS Silicon Valley Forum, San Jose, CA, USA. May 3, 2018. Title: “Envisioning Global Energy Solutions: Renewable Energy for the Future and Making the Power Grid Smart.”
- [5] Invited Talk. UC Cyber Security Summit, University of California, Santa Cruz, CA, USA. April 25, 2018. Title: “Secure Algorithms for Cyber-Physical Systems.”
- [6] Research Overview Talk. Ford Motor Company, San Jose, CA, USA. January 12, 2018. Title: “Introduction to the Hybrid Systems Laboratory and Cyber-Physical Research Center.”
- [7] Invited Talk. National Science Foundation, Washington DC, Virginia, November 14, 2017. Workshop “Unmanned and Autonomous Systems” within Annual Cyber-physical Systems Program Contractor’s Meeting. Title: “Overcoming Algorithm Design Challenges in Networked Autonomous Systems via Hybrid Predictive Control.”
- [8] Project Review Talk. National Science Foundation, Washington DC, Virginia, November 13, 2017. Lightning Talk within Annual Cyber-physical Systems Program Contractor’s Meeting. Title: “Computationally-Aware Cyber-Physical Systems.”

- [9] Project Review Talk. Air Force Office of Research, Washington DC, Virginia, September 14, 2017. Annual Contractor’s Meeting. Title: “Synchronization in Networks of Hybrid Systems.”
- [10] Invited Talk. 1st IEEE Conference on Control Technology and Applications (CCTA), Kona, Hawaii, August 29, 2017. NSF CAREER Awardees Invited Session. Title: “An Overview of Recent Advances and Future Challenges in Hybrid Feedback Control Design.”
- [11] Invited Talk. CITRIS Day Panel ”Pioneering Platforms and Applications”, UCSC Extension, November 8, 2017. Title: “Cyber-Physical Systems: Platforms and Applications.”
- [12] Invited Talk. Université de Lyon, Lyon, France. July 6, 2017. Title: “Challenges and Recent Results on Contraction-type Properties in Hybrid Systems.”
- [13] Invited Talk. NASA Ames Research Center, Mountain View, California, USA. May 18, 2017. Title: “Computationally Aware Control: Trading Accuracy by Computational Performance.”
- [14] Invited Talk. Mathematics Department, University of California, Santa Cruz, California, USA. February 21, 2017. Title: “Structural Properties and Tools for Robustness in Hybrid Systems.”
- [15] Research Center Talk. Presentation of Cyber-Physical Systems Research Center to Epson, Hitachi, Airspace, Ford Motor Company, ST, and OnSemi. 2017.
- [16] Invited Talk. Bay Area Robotics Symposium, Stanford, California, USA. November 18, 2016. Title: “Hybrid Predictive Control with Applications.”
- [17] Research Overview Talk. Computer Engineering Department, CMPE200: Faculty Research Presentation, University of California, Santa Cruz, California, USA. November 7, 2016. Title: “Feedback Control of Hybrid Dynamical Systems: from Cells to Power Networks.”
- [18] Invited Talk. Instituto Superior Tecnológico, Lisbon, Portugal. November 3, 2016. Title: “A Brief Introduction to Hybrid Systems and Control.”
- [19] Research Review Talk. National Science Foundation, Washington DC, USA. November 1, 2016. Title: “Computationally-Aware Cyber-Physical Systems.”
- [20] Invited Talk. LAAS, Toulouse, France. October 27, 2016. Title: “Robust Hybrid Feedback Control Design for Networked Systems.”
- [21] Invited Talk. Electrical and Computer Engineering Department, Boston University, Boston, USA. April 1, 2016. Title: “Robust Hybrid Feedback Control Design for Networked Systems.”

- [22] Invited Talk. Electrical and Computer Engineering Department, University of Southern California, California, USA. February 2, 2016. Title: “Constructive Feedback Control Design for Hybrid Dynamical Systems.”
- [23] Invited Talk. Electrical and Computer Engineering Department, University of California, Los Angeles, California, USA. February 1, 2016. Title: “Constructive Feedback Control Design for Hybrid Dynamical Systems.”
- [24] Invited Talk. Electrical Engineering and Computer Science Department, University of California, Berkeley, California, USA. November 30, 2015. Title: “Constructive Feedback Control Design for Hybrid Dynamical Systems.”
- [25] Invited Talk. Computer Engineering Department, CMPE200: Faculty Research Presentation, University of California, Santa Cruz, California, USA. November 24, 2015. Title: “Feedback Control of Hybrid Dynamical Systems: from Cells to Power Networks.”
- [26] Invited Talk. Rotary Club, Santa Cruz, California, USA. November 20, 2015. Title: “Autonomy in Robotic Networks: Challenges and Opportunities Ahead.”
- [27] Invited Talk. Electrical and Computer Engineering Department, Cambridge University, Cambridge, United Kingdom. May 20, 2015. Title: “Nonlinear Observers with a Contracting Riemannian Distance: Necessary and Sufficient Conditions.”
- [28] Invited Talk. Air Force Research Laboratory, Albuquerque, NM, USA. April 30, 2015. Title: “Hybrid Control for Aerospace Robotics: From Hybrid Systems Theory to Robust Global Tracking Algorithms for Underactuated Vehicles, and Back.”
- [29] Invited Talk. Electrical and Computer Engineering Department, University of California, Santa Barbara, California, USA. April 17, 2015. Title: “Nonlinear Observers with a Contracting Riemannian Distance: Necessary and Sufficient Conditions.”
- [30] Invited Talk. Electrical Engineering and Computer Science Department, Merced, California, USA. February 26, 2015. Title: “Hybrid Control for Aerospace Robotics: From Hybrid Systems Theory to Robust Global Tracking Algorithms for Underactuated Vehicles, and Back.”
- [31] Invited Talk. Aerospace Engineering Department, Stanford, California, USA. January 14, 2015. Title: “Hybrid Control for Aerospace Robotics: From Hybrid Systems Theory to Robust Global Tracking Algorithms for Underactuated Vehicles, and Back.”
- [32] Research Overview Talk. Computer Engineering Department, CMPE200: Faculty Research Presentation, University of California, Santa Cruz, California, USA. November 25, 2014. Title: “Feedback Control of Hybrid Dynamical Systems: from Cells to Power Networks.”
- [33] Invited Talk. Applied Mathematics Department, Naval Postgraduate School, Monterey, California, USA. July 10, 2014. Title: “Analysis and Control of Hybrid Dynamical Systems.”

- [34] Invited Talk. Applied Mathematics Department, Naval Postgraduate School, Monterey, California, USA. July 10, 2014. Title: “Analysis and Control of Hybrid Dynamical Systems.”
- [35] Research Review Talk. YIP Awardees Meeting, Air Force Office for Scientific Research, Washington DC, USA. June 24, 2014. Title: “Distributed Estimation over Networks with Performance and Robustness.”
- [36] Invited Talk. Department of Electrical and Computer Engineering, University of Illinois, Urbana-Champaign, USA. February 19, 2014. Title: “Nonlinear Observers with a Contracting Riemannian Distance: Necessary and Sufficient Conditions.”
- [37] Invited Talk. Department of Electrical and Computer Engineering, University of Bologna, Bologna, Italy. December 6, 2013. Title: “Robust Stability and Control of Hybrid Dynamical Systems.”
- [38] Invited Talk. Department of Mechanical Engineering, TU/e, Eindhoven, The Netherlands. December 4, 2013. Title: “Robust Stability and Control of Hybrid Dynamical Systems.”
- [39] Research Overview Talk. Engineering 102, University of Arizona, AZ, USA. November 12, 2013. Title: “Introduction to the Hybrid Dynamics and Control Laboratory.”
- [40] Invited Talk. Instituto Tecnológico Buenos Aires (ITBA), Buenos Aires, Argentina. October 22, 2013. Title: “Feedback Control of Hybrid Dynamical Systems: from Cells to Power Networks.”
- [41] Research Review Talk. AFOSR Contractors Meeting, Washington DC, USA. August 6, 2013. Title: “Distributed Estimation with Performance and Robustness Guarantees.”
- [42] Plenary Talk. SIAM Annual Meeting/Control and Applications Conference, San Diego, CA, USA. July 10, 2013. Title: “Feedback Control of Hybrid Dynamical Systems: from Cells to Power Networks.”
- [43] Invited Talk. Arizona State University, Phoenix, AZ, USA. June 24, 2013. Title: “Feedback Control of Hybrid Dynamical Systems: from Cells to Power Networks.”
- [44] Invited Talk. University of New Mexico, Albuquerque, NM, USA. June 21, 2013. Title: “Feedback Control of Hybrid Dynamical Systems: from Cells to Power Networks.”
- [45] Invited Talk. Air Force Research Laboratory, Albuquerque, NM, USA. June 20, 2013. Title: “Robust Global Attitude Tracking via Quaternion-Based Hybrid Control.”
- [46] Invited Lectures. Applied Math Program, Department of Mathematics, The University of Arizona, Tucson, Arizona, USA. April 17 and 24, 2013. (2 Lectures.) Titles: “Problems in Modeling and Analysis of Hybrid Dynamical Systems – Lecture 1: Introduction” and “Problems in Modeling and Analysis of Hybrid Dynamical Systems – Lecture 2: Open problems.”

- [47] Research Overview Talk. Engineering 102, University of Arizona, AZ, USA. March 26, 2013. Title: “Introduction to the Hybrid Dynamics and Control Laboratory.”
- [48] Research Review Talk. Connection One Semi-annual Meeting and Workshop, Tucson, AZ, USA. January 18, 2013. Title: “Hybrid Control of High-Speed Unmanned Surface Vessels for Oceanic and Atmospheric Research.”
- [49] Invited Talk. Yuma Proving Ground Meeting, Tucson, Arizona, USA. November 28, 2012. Title: “Robust Hybrid Control Algorithms for Multi-agent Systems.”
- [50] Distinguished Lecture. Educator of the Year, Society of Hispanic Professional Engineers National Conference, Forth Worth, TX, USA. November 16, 2012. Title: “A Hybrid Systems Theory for Robustness and its Applications.”
- [51] Invited Talk. Engineering Research Symposium on Computer Science and Engineering, Society of Hispanic Professional Engineers National Conference, Forth Worth, TX, USA. November 16, 2012. Title: “A Hybrid Systems Theory for Robustness and its Application to the Analysis and Simulation of Smart Grids.”
- [52] Research Overview Talk. Engineering 102, University of Arizona, AZ, USA. November 6, 2012. Title: “Introduction to Hybrid Control Systems.”
- [53] Invited Talk. Air Force Research Laboratory, Albuquerque, NM, USA. June 8, 2012. Title: “On Interconnections of Hybrid Systems with Inputs and Outputs.”
- [54] Invited Talk. Hybrid Architecture and Constraints Workshop, Paris, France. June 5, 2012. Title: “Control and Interconnections of Hybrid Systems.”
- [55] Invited Talk. Supelec, Gif-sur-Yvette, France. May 31, 2012. Title: “Modeling and Control of Hybrid Dynamical Systems.”
- [56] Invited Talk. Raytheon Missile Systems, Tucson, AZ, USA. February 23, 2012. Title: “Hybrid Control for Aerospace Vehicles.”
- [57] Invited Talk. Raytheon Missile Systems meeting, University of Arizona, Tucson, AZ, USA. February 7, 2012. Title: “Hybrid Control Algorithms in Low Cost Embedded System Platforms.”
- [58] Research Review Talk. Connection One Semi-annual Meeting and Workshop, Phoenix, AZ, USA. January 26, 2012. Title: “Hybrid Control of High-Speed Unmanned Surface Vessels for Oceanic and Atmospheric Research.”
- [59] Invited Talk. University of Michigan, Ann Arbor, MI, USA. November 4, 2011. Title: “Interconnections and Control of Hybrid Systems.”
- [60] Invited Talk. University of Delaware, Delaware, DE, USA. October 24, 2011. Title: “Robust Hybrid Control Algorithms for Complex Unmanned Systems Missions.”

- [61] Research Review Talk. Industry Partner Board Meeting. University of Arizona, Tucson, AZ, USA. October 15, 2011. Title: “Robust Hybrid Control Algorithms for Aerospace Applications.”
- [62] Invited Talk. Honeywell, Phoenix, AZ, USA. October 14, 2011. Title: “Robust Hybrid Control Algorithms for Aerospace Applications.”
- [63] Invited Talk. Raytheon Industry Day. University of Arizona, Tucson, AZ, USA. October 12, 2011. Title: “Robust Hybrid Control Algorithms for Aerospace Applications.”
- [64] Invited Talk. Air Force Research Laboratory, Kirtland, Albuquerque, New Mexico, USA. August 18, 2011. Title: “Robust Hybrid Control Algorithms for Multi-agent Space Systems.”
- [65] Invited Talk. Sandia National Laboratories, Computer Science Research Institute, Albuquerque, New Mexico, USA. August 17, 2011. Title: “A Hybrid Systems Theory for Robustness and its Application to the Analysis and Simulation of Smart Grids.”
- [66] Invited Talk. Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, New Mexico, USA. July 28, 2011. Title: “On Interconnections of Hybrid Systems with Inputs and Outputs.”
- [67] Plenary Talk. DYSCO Network Study Days, Liege, Belgium. May 12, 2011. Title: “Hybrid Dynamical Systems: Modeling, Stability, and Robustness.”
- [68] Invited Talk. 2011 EECI Graduate School on Control, CNRS, Laboratoire des Signaux et Systemes (INSIS & INS2I) & European Embedded Control Institute (EECI), SUPELEC, Gif-sur-Yvette, France, May 2-5 (21 hours of teaching), 2011. Title: “Robust Hybrid Control Systems.”
- [69] Invited Talk. Institut fuer Systemtheorie und Regelungstechnik, University of Stuttgart, Stuttgart, Germany. May 6, 2011. Title: “A Dynamical Systems Approach to Modeling and Robust Stability Analysis of Hybrid Control Systems.”
- [70] Invited Talk. Raytheon Missile Systems, Tucson, AZ, USA. February 2, 2011. Title: “Robust Hybrid Control Systems: Applications and Methods.”
- [71] Invited Talk. 2010 Workshop on Hybrid Dynamic Systems, University of Waterloo, Waterloo, Canada. July 30, 2010. Title: “Input/Output Notions and Tools For Analysis of Interconnections of Hybrid Dynamical Systems.”
- [72] Invited Talk. Air Force Research Laboratory, Kirtland, Albuquerque, New Mexico, USA. July 14, 2010. Title: “A Dynamical Systems Approach to Modeling and Robust Stability Analysis of Hybrid Control Systems.”
- [73] Invited Talk. Department of Neuroscience, The University of Arizona, Tucson, Arizona, USA. March 28, 2010. Title: “Investigations of Fundamentals of Emergent Flight Behaviors of Groups of Air Vehicles.”

- [74] Invited Lectures. Applied Math Program, Department of Mathematics, The University of Arizona, Tucson, Arizona, USA. February 17 and 24, 2010. (2 Lectures.) Titles: “Problems in Modeling and Analysis of Hybrid Dynamical Systems – Lecture 1: Introduction” and “Problems in Modeling and Analysis of Hybrid Dynamical Systems – Lecture 2: Open problems.”
- [75] Invited Talk. Department of Electrical and Computer Engineering, The University of Arizona, Tucson, Arizona, USA. February 10, 2010. Title: “Robust Stability Analysis of Hybrid Control Systems.”
- [76] Invited Talk. Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, New Mexico, USA. October 23, 2009. Title: “A Dynamical Systems Approach to Modeling and Robust Stability Analysis of Hybrid Control Systems.”
- [77] Invited Talk. Applied Math Program, Department of Mathematics, The University of Arizona, Tucson, Arizona, USA. October 15, 2009. Title: “A Dynamical Systems Approach to Modeling and Robust Stability Analysis of Hybrid Control Systems.”
- [78] Invited Talk. Department of Aerospace and Mechanical Engineering, The University of Arizona, Tucson, Arizona, USA. October 15, 2009. Title: “A Dynamical Systems Approach to Modeling and Robust Stability Analysis of Hybrid Control Systems.”
- [79] Invited Talk. Department of Electrical Engineering, Universidad de Mar del Plata, Buenos Aires, Argentina. June 12, 2009. Title: “A Dynamical Systems Approach to Modeling and Robust Stability Analysis of Hybrid Control Systems.”
- [80] Invited Talk. Department of Mechanical Engineering, TU/e, Eindhoven, The Netherlands. November 2008.
- [81] Invited Talk. Department of Electrical and Computer Engineering, Imperial College, London, UK. October 2008.
- [82] Invited Talk. Centre Automatique et Systèmes, Ecole de Mines de Paris, Paris, France. October 2008.
- [83] Invited Talk. Fifth World Congress of Nonlinear Analysts 2008 (WCNA-2008), Orlando, Florida, USA. July 2008.
- [84] Invited Talk. Department of Mechanical and Aerospace Engineering, University of Florida, Gainesville, Florida, USA. May 2008.

12 Conference Participation

2nd Conference on Control Technology and Applications, Copenhagen, Denmark, 2018.

6th IFAC Conference on Nonlinear Model Predictive Control, Wisconsin-Madison, WI, USA, 2018.

6th IFAC Conference on Analysis and Design of Hybrid Systems, Oxford, UK, 2018.

IFAC Workshop on Networked & Autonomous Air & Space Systems (NAASS), Santa Fe, New Mexico, USA, 2018.

American Control Conference, Milwaukee, WI, USA, 2018.

56th IEEE Conference on Decision and Control, Melbourne, Australia, 2017.

1st Conference on Control Technology and Applications, Big Island, Hawaii, USA, 2017.

American Control Conference, Seattle, WA, USA, 2017.

55th IEEE Conference on Decision and Control, Las Vegas, USA, 2016.

IFAC Nonlinear Control Systems Symposium, Monterey, CA, USA, 2016.

American Control Conference, Boston, MA, USA, 2016.

19th International Conference on Hybrid Systems: Computation and Control, Vienna, Austria, 2016.

54th IEEE Conference on Decision and Control, Osaka, Japan, 2015.

5th IFAC Conference on Analysis and Design of Hybrid Systems, Atlanta, Georgia, USA, 2015.

IFAC Conference on Analysis and Design of Hybrid Systems, Atlanta, Georgia, USA, 2015.

AAU STEM Faculty Learning Community, 2015.

Computation and Control Conference, Berlin, Germany, 2014

13th European Control Conference, Strasbourg, France, 2014.

3rd International Workshop on Hybrid Systems Biology, 2014.

53th IEEE Conference on Decision and Control, Los Angeles, USA, 2014.

SummerSim, Monterey, California, USA, 2014.

33th American Control Conference, Portland, Oregon, USA, 2014.

6th Arizona Faculty Doctoral Mentoring Institute, AZ, USA, 2013.

52th IEEE Conference on Decision and Control, Florence, Italy, 2013.

SIAM Annual Meeting and SIAM Conference on Control and Its Applications, San Diego, USA, 2013.

32th American Control Conference, Washington DC, USA, 2013.

12th European Control Conference, Zurich, Switzerland. 2013.

Computation and Control Conference, Philadelphia, Pennsylvania, USA, 2013.

51th IEEE Conference on Decision and Control, Maui, HI, USA, 2012.

World Engineering Education Forum, Buenos Aires, Argentina, 2012.

Computation and Control Conference, Beijing, China, 2012.

50th IEEE Conference on Decision and Control, Orlando, FL, USA, 2011.

30th American Control Conference, San Francisco, USA, 2011.

Hybrid Systems: Computation and Control Conference, Chicago, IL, USA, 2011.

49th IEEE Conference on Decision and Control, Atlanta, GA, USA, 2010.

2010 Naval Science and Technology Partnership Conference, Washington DC, 2010.

29th American Control Conference, Baltimore, USA, 2010.

IEEE Multi-Conference on Systems and Control, Yokohama, Japan, 2010.

48th IEEE Conference on Decision and Control and 28th Chinese Control Conference, Shanghai, China, 2009.

47th IEEE Conference on Decision and Control, Cancun, Mexico, 2007.

27th American Control Conference, Seattle, USA, 2008.

Hybrid Systems: Computation and Control Conference, St. Louis, MO, USA, 2008.

47th IEEE Conference on Decision and Control, Cancun, Mexico. 2008.

46th IEEE Conference on Decision and Control, New Orleans, LA, USA, 2007.

26th American Control Conference, New York, USA, 2007.

45th IEEE Conference on Decision and Control, San Diego, CA, USA, 2006.

25th American Control Conference, Minneapolis, MN, USA, 2006.

Hybrid Systems:Computation and Control Conference, Santa Barbara, CA, USA, 2006.

44th IEEE Conference on Decision and Control and European Control Conference, Seville, Spain, 2005.

24th American Control Conference, Portland, OR, USA, 2005.

13 Conference Presentations

- [1] Robust Hybrid Supervisory Control for 3-DOF Spacecraft in Close-Proximity Operations. *Proc. IFAC Workshop on Networked & Autonomous Air & Space Systems*, Santa Fe, New Mexico, 2018.
- [2] Passivity Tools for Hybrid DAE Systems with Applications to Switched DAE Systems. *Proc. IEEE Conference on Decision and Control*, Melbourne, Australia, 2017.
- [3] A Hybrid Predictive Control Algorithm for Tracking in a Single-Phase DC/AC Inverter. *Proc. Conference on Control Technology and Applications*, Big Island, Hawaii, USA, 2017.
- [4] Sufficient conditions for Asymptotic Stability and Feedback Control of Set Dynamical Systems. *Proc. American Control Conference*, Seattle, USA, 2017.
- [5] Robust Asymptotic Stabilization of Hybrid Systems using Control Lyapunov Functions. *Proc. 19th International Conference on Hybrid Systems: Computation and Control*, Vienna, Austria, 2016.
- [6] Exponential Stabilization of a Vectored-Thrust Vehicle Using Synergistic Potential Functions. *Proc. American Control Conference*, Boston, USA, 2016.
- [7] Computationally Tractable Implementations of Pointwise Minimum Norm State-Feedback Laws for Hybrid Systems. *Proc. American Control Conference*, Boston, USA, 2016.

- [8] How well-posedness of hybrid systems can extend beyond Zeno times. *Proc. IEEE Conference on Decision and Control*, Las Vegas, USA, 2015.
- [9] Solution of a Riccati equation for the design of an observer contracting a Riemannian distance. *Proc. IEEE Conference on Decision and Control*, Tokyo, Japan, 2015.
- [10] Hybrid Feedback Control Methods for Robust and Global Power Conversion. *Proc. 5th Conference on Analysis and Design of Hybrid Systems*, Atlanta, USA, 2015.
- [11] On Robust Stability of Limit Cycles for Hybrid Systems With Multiple Jumps. *Proc. 5th Conference on Analysis and Design of Hybrid Systems*, Atlanta, USA, 2015.
- [12] Asymptotic Properties of Solutions to Set Dynamical Systems. *Proc. IEEE Conference on Decision and Control*, Los Angeles, USA, 2014.
- [13] Pointwise Minimum-norm Control Laws for Hybrid Systems. *Proc. IEEE Conference on Decision and Control*, Florence, Italy, 2013.
- [14] A Robust Finite-time Convergent Hybrid Observer for Linear Systems. *Proc. IEEE Conference on Decision and Control*, Florence, Italy, 2013.
- [15] On the Stability of Hybrid Limit Cycles and Isolated Equilibria in a Genetic Network with Binary Hysteresis. *Proc. IEEE Conference on Decision and Control*, Florence, Italy, 2013.
- [16] Variational Analysis for Stabilizability of Hybrid Systems. *SIAM Conference on Control and Its Applications*, San Diego, USA, 2013.
- [17] A Landmark-Based Controller for Global Asymptotic Stabilization on $SE(3)$. *Proc. IEEE Conference on Decision and Control*, Maui, USA, 2012.
- [18] Control Lyapunov functions and stabilizability of compact sets for hybrid systems. *Proc. Joint Conference on Decision and Control and European Control Conference*, Orlando, USA, 2011.
- [19] Tracking Control for Hybrid Systems via Embedding of Known Reference Trajectories. *Proc. 30th American Control Conference*, San Francisco, USA, 2011.
- [20] Results on input-to-output and input-output-to-state stability for hybrid systems and their interconnections. *49th IEEE Conference on Decision and Control*, Atlanta, USA, 2010.
- [21] Uniting two output-feedback hybrid controllers with different objectives. *Proc. 29th American Control Conference*, Baltimore, USA, 2010.
- [22] Nonlinear observer design with an appropriate Riemannian metric. *48th IEEE Conference on Decision and Control and 28th Chinese Control Conference*, Shanghai, China, 2009.

- [23] On the optimality of Dubins paths across heterogeneous terrain. *Hybrid Systems: Computation and Control Conference*, St. Louis, USA, 2008.
- [24] A hybrid control framework for robust maneuver-based motion planning. *27th American Control Conference*, Seattle, USA, 2008.
- [25] A nested Matrosov theorem for hybrid systems. *27th American Control Conference*, Seattle, USA, 2008.
- [26] A hybrid systems approach to trajectory tracking control for juggling systems. *Proc. 46th IEEE Conference on Decision and Control*, New Orleans, USA, 2007.
- [27] A “throw-and-catch” hybrid control strategy for robust global stabilization of nonlinear systems. *26th American Control Conference*, New York, USA, 2007.
- [28] On the continuity of asymptotically stable compact sets for simulations of hybrid systems. *45th IEEE Conference on Decision and Control*, San Diego, USA, 2006.
- [29] Lyapunov analysis of sample-and-hold hybrid feedbacks. *45th IEEE Conference on Decision and Control*, San Diego, USA, 2006.
- [30] A feedback control motivation for generalized solutions to hybrid systems. *Hybrid Systems: Computation and Control Conference*, Santa Barbara, USA, 2006.
- [31] On the robustness to measurement noise and unmodeled dynamics of stability in hybrid systems. *Proc. 25th American Control Conference*, Minneapolis, USA, 2006.
- [32] Robust hybrid controllers for continuous-time systems with applications to obstacle avoidance and regulation to disconnected set of points. *26th American Control Conference*, Minneapolis, USA, 2006.
- [33] On hybrid controllers that induce input-to-state stability with respect to measurement noise. *44th IEEE Conference on Decision and Control and European Control Conference*, Seville, Spain, 2005.
- [34] Results on convergence in hybrid systems via detectability and an invariance principle. *24th American Control Conference*, Portland, USA, 2005.

14 Poster Presentations

- [1] 2017 Workshop on Brain Dynamics and Neurocontrol Engineering, St. Louis, MO, USA, June 25-27, 2017. Title: “Hybrid Systems Methods for Analysis of Networks of Spiking Neurons.”
- [2] Symposium on Robot Learning, Berkeley, CA, USA, May 1, 2017. Title: “Computationally Aware Cyber-Physical Systems.”

- [3] Symposium on Robot Learning, Berkeley, CA, USA, May 1, 2017. Title: “Hybrid Control Algorithm for Object Grasping Using Multiple Agents.”
- [4] Symposium on Robot Learning, Berkeley, CA, USA, May 1, 2017. Title: “Obstacle Detection and Avoidance Using Radar and Robust Hybrid Controller.”
- [5] Symposium on Robot Learning, Berkeley, CA, USA, May 1, 2017. Title: “A Hybrid Systems Approach to Tracking Control of a Fully Actuated Biped.”
- [6] Baskin School of Engineering Open House, Santa Cruz, CA, USA, March 17, 2017. Title: “Estimation and Synchronization of Multi-agent Systems Using Tools for hybrid Systems.”
- [7] 1st Annual CROSS Research Symposium, Santa Cruz, CA, USA, October 24-25, 2016.
- [8] The 2016 American Control Conference, Boston, Massachusetts, USA, June 8, 2016. Title: “Robust global trajectory tracking for a class of underactuated vehicles.”
- [9] 12th Annual Graduate Research Symposium, Santa Cruz, CA, USA, April 29, 2016. Title: “Hybrid Control Algorithms for Robust Power Conversion in Smart Grids.”
- [10] 12th Annual Graduate Research Symposium, Santa Cruz, CA, USA, April 29, 2016. Title: “Estimation and Synchronization of Multi-agent Systems Using Tools for hybrid Systems.”
- [11] CITRIS at UC Santa Cruz Open House, Santa Cruz, CA, USA, April 12, 2016. Title: “Hybrid Control Algorithms for Robust Power Conversion in Smart Grids.”
- [12] CITRIS at UC Santa Cruz Open House, Santa Cruz, CA, USA, April 12, 2016. Title: “Estimation and Synchronization of Multi-agent Systems Using Tools for hybrid Systems.”
- [13] CROSS meeting, Santa Cruz, CA, USA, Winter, 2015. Title: “Strong Consistency in Dynamic Wireless Networks to Enable Safe and Efficient Navigation of Autonomous Vehicles.”
- [14] 6th Annual Cyber-Physical Systems Principal Investigators?? Meeting, Arlington, VA, USA, October 31, 2015. Title: “Computationally Aware Cyber-Physical Systems.”
- [15] UCSC Research Review Day, Santa Cruz, CA, USA, October 14, 2015. Title: “Hybrid Control Algorithms for Robust Power Conversion in Smart Grids.”
- [16] UCSC Research Review Day, Santa Cruz, CA, USA, October 14, 2015. Title: “Estimation and Synchronization of Multi-agent Systems Using Tools for hybrid Systems.”
- [17] CITRIS Day 2015, Berkeley, CA, USA, October 13, 2015. Title: “Estimation and Synchronization of Multi-agent Systems Using Tools for Hybrid Systems?????”

- [18] CITRIS Day 2015, Berkeley, CA, USA, October 13, 2015. Title: “Hybrid Control Algorithms for Robust Power Conversion in Smart Grids?????”
- [19] Dynamics Days US 2013, Denver, CO, USA. January 3-6, 2013. Title: “A New Method for Computing Lyapunov Exponents for the Chaotic Bouncing Ball.”
- [20] NSF Connection One Semi-Annual Meeting, Tucson, AZ, USA. January 17-18, 2013. Title: “On Desynchronization of Impulsive Oscillators for Coordination of Actions of Multiple Players.”
- [21] Cognitive RF Workshop, Kirtland AFB, Albuquerque, NM, USA. September 26-27, 2012. Title: “Adaptive Frequency Hopping and Synchronization-Based Algorithms for Rendezvous.”
- [22] NSF Connection One Semi-Annual Meeting, Scottsdale, AZ, USA. May 23-24, 2012. Title: “Hybrid Control of High-Speed Unmanned Surface Vessels for Oceanic and Atmospheric Research.”
- [23] NSF Connection One Semi-Annual Meeting, Scottsdale, AZ, USA. May 23-24, 2012. Title: “On the Synchronization of Impulsive Oscillators For Decentralized Rendezvous.”
- [24] Cognitive RF Workshop, Wright Patterson AFB, Dayton, OH, USA. September 21-22, 2011. Title: “Robust Hybrid Control Algorithms for Reconfigurable Multi-agent Space Systems.”

15 Visiting Scholars

Alessandro Melis, University of Bologna, Italy. October 2018-present.

Pauline Bernard, Postdoc, University of California, Santa Cruz. Winter 2017-Spring 2017.

Jose Luis Mancilla-Aguilar, Professor, Instituto Tecnológico Buenos Aires. March 2018.

Francesco Ferrante, Postdoc, University of California, Santa Cruz. Fall 2016-Fall 2017.

Giulia Zucchini, University of Bologna, Italy. August 2017-March 2018.

Luca Torquati, University of Trento, Italy. August 2016-March 2017.

Stephan Trenn, Professor, Technische Universität Kaiserslautern, Germany. August 2016.

Nathan van de Wouw, Professor, Tu/e, The Netherlands. August 2016.

Xuyang Lou, Professor, Jiangnan University, China. August 2014-August 2015.

Laurent Praly, Ecole des Mines de Paris, Paris, France. December 2014 and August 2016.

Francesco Ferrante, LAAS-CNRS, Toulouse, France. July 2014-August 2014.

Pablo Nãñez, Universidad de los Andes, Colombia. September 2012-present.

Francesco Fichera, LAAS-CNRS, Toulouse, France. January 2013-February 2013.

Thomas Theunisse, TU/e, Eindhoven, The Netherlands. September 2012-December 2012.

Pedro Casau, Instituto Superior Tecnico, Portugal. September 2011-December 2011, April 2013-July 2013, and December 2014.

Dr. Roberto Naldi, University of Bologna, Italy. October 2010 and January 2013.

Qian Ye, Graduate student, Jiangnan University, China. September 2010-September 2011.

16 Professional Activities

Associate Editor, Automatica. April 2015-present.

Chair of IEEE CSS Technical Committee on Hybrid Systems. 2016-present.

Conference Editorial Board Member of the IEEE Control Systems Society. 2015-present.

Member of Best Paper Award Committee, Nonlinear Analysis: Hybrid Systems (journal), Elsevier, USA. 2016-present.

Faculty advisor of Society of Hispanic Professional Engineers (SHPE), at the University of California, Santa Cruz. 2016-present.

Organizer of Workshop “Smart Power and Cyber-Physical Systems” at the 3rd Annual CROSS Research Symposium, University of California, Santa Cruz, CA, USA. October 2018.

Organizer of CITRIS/CPAR Control Theory and Automation Symposium – 1st NorCal Control Workshop. University of California, Santa Cruz, CA, USA. 2018.

Best Paper Award Committee Member, IEEE Control Systems Society. 2018.

Associate Editor for the 2018 IEEE Conference on Control Technology and Applications. 2018.

Program Committee Member, 6th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS), Oxford, Cambridge, UK. 2018.

Program Committee Member, Hybrid Systems: Computation and Control Conference, Porto, Portugal. 2018.

Organizer of Workshop “Security in Network Systems” at the 2nd Annual CROSS Research Symposium, University of California, Santa Cruz, CA, USA. October 2017.

Technical Program Committee Member, IEEE Conference on Decision and Control. 2017.

Organizer of Workshop “Verification and Synthesis for Hybrid Systems” at UT Austin, TX, USA. June 1-2, 2017.

Chair of Best Student Paper Award, Hybrid Systems: Computation and Control Conference, Pittsburgh, USA. 2017.

Program Committee Member, Hybrid Systems: Computation and Control Conference, Pittsburgh, USA. 2017.

Program Committee Member, International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAN), San Francisco, California, December 13-16, 2016.

Organizer of Pre-Conference Workshop “Feedback Control of Hybrid Systems” at the 2016 IEEE Conference on Decision and Control, Las Vegas, NV, USA. December 2016.

Organizer of Workshop “Data-Driven Dynamic Networked Systems” at the 1st Annual CROSS Research Symposium, University of California, Santa Cruz, CA, USA. October 2016.

Area Chair for Hybrid Systems, IFAC Nonlinear Control Systems Symposium, Monterey, CA. 2016.

National Organizing Committee Member, Nonlinear Control Symposium (NOLCOS), Monterey, California, USA. 2016.

Co-chair of Wikipage Committee of IEEE CSS Technical Committee on Hybrid Systems <http://hybrid-systems.ieeecss.org/tc-hybrid/tc-members>. 2015.

Organizer of Pre-Conference Tutorial “Control Theoretical Tools for Analysis and Design of Cyber-Physical Systems” at the CPSWeek 2016, Vienna, Austria. April 2016.

Chair of the sessions “Switched Systems” and “Advances in Attitude Control Systems II”, organizer of the session “Advances in Attitude Control Systems II”, and co-chair of the ses-

sion “Networked Control Systems III”—at the 2015 American Control Conference, Chicago, Illinois, USA.

Chair of session “Kalman Filtering” at the 2015 IEEE Conference on Decision and Control, Osaka, Japan.

Program Committee Member, 5th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS), Atlanta, Georgia, USA. 2015.

Program Committee Member, Hybrid Systems: Computation and Control Conference, Berlin, Germany. 2014.

Program Committee Member, 13th European Control Conference, Strasbourg, France. 2014.

Program Committee Member, 3rd International Workshop on Hybrid Systems Biology (HSB 2014), Vienna, Austria. 2014.

Chair of sessions “Estimation II” and “Hybrid Systems” and organizer of the session “Advances in Attitude Control Systems II” at the 2014 American Control Conference, Portland, Oregon, USA.

Organizer of the sessions “Variational Analysis in Dynamics and Control I” and “Variational Analysis in Dynamics and Control II”; chair of the session “Variational Analysis in Dynamics and Control I” and co-chair of the session “Variational Analysis in Dynamics and Control II” at the 2014 IEEE Conference on Decision and Control, Los Angeles, California, USA.

Participant in the AAU STEM Faculty Learning Community, “How to Best Engage Students,” Fall 2013 and Spring 2014.

Participant in the 6th Arizona Faculty Doctoral Mentoring Institute held at Arizona State University, March 4, 2013.

Program Committee Member, Hybrid Systems: Computation and Control Conference, Berlin, Germany. 2014.

Program Committee Member, 13th European Control Conference, Strasbourg, France. 2014.

Program Committee Member, Hybrid Systems: Computation and Control Conference, Philadelphia, Pennsylvania, USA. 2013.

Program Committee Member, 12th European Control Conference, Zurich, Switzerland. 2013.

Program Committee Member, Hybrid Systems: Computation and Control Conference, Beijing, China. 2012.

Panelist of Mathworks: Bridging the Theory-Practice Gap Through Industry-Relevant Control Education – a Panel Discussion organized by G. Campa and A. Turevskiy from MathWorks, American Control Conference, San Francisco, California, USA. 2011.

Member of the Institute for Broadening Participation (IBP) for building partnerships to support diversity in STEM. 2011-present.

Consultant for Hydronalix, Sahuarita, Arizona. 2011.

Program Committee Member, Hybrid Systems: Computation and Control Conference, Chicago, USA. 2011.

Program Committee Member, IEEE International Symposium on Intelligent Control. 2010.

Committee Member, 2010 IEEE Multi-Conference on Systems and Control, Yokohama, Japan. 2010.

Reviewer of technical papers submitted to the journals: IEEE Transactions on Automatic Control; Automatica; Nonlinear Analysis Series A: Theory, Methods & Applications; ASME Journal of Computational and Nonlinear Dynamics.

Reviewer of technical papers submitted to the conferences: IEEE Conference on Decision and Control; Hybrid Systems: Computation and Control; American Control Conference; IFAC World Congress.

Co-chair of sessions “Linear System Observers” and “Hybrid Systems II” at the 2013 IEEE Conference on Decision and Control, Florence, Italy. 2013.

Co-chair of session “Hybrid Systems II” at the 2011 American Control Conference, San Francisco, CA, USA. 2011.

Chair of session “Synthesis II” at the Hybrid Systems: Computation and Control Conference, Chicago, IL, USA, 2011.

Co-chair of session “Hybrid Systems III” at the 49th IEEE Conference on Decision and Control, Atlanta, GA, USA. 2010.

Co-chair of session “Stabilization of Hybrid Systems” at the 48th IEEE Conference on Decision and Control/28th Chinese Control Conference, Shanghai, China. 2009.

Chair of session “Nonlinear Control Analysis and Applications II” at the 2008 American Control Conference, Seattle, WA, USA. 2008.

Chair of session “Analysis of Hybrid Systems” and co-chair of sessions ” Autonomous Robots” and ”Hybrid and Quantized systems” at the 47th IEEE Conference on Decision and Control, Cancun, Mexico, USA. 2008.

Chair of sessions “Stability of hybrid systems” and “Applications of control theories in discrete event and hybrid systems” at the 46th IEEE Conference on Decision and Control, New Orleans, LA, USA. 2007.

Co-chair of session “Hybrid systems” at the 45th IEEE Conference on Decision and Control, San Diego, CA, USA. 2006.

17 Academic and Service Work

Reader for M.S. Project. Student: *Brad Thompson*. Department Computer Engineering, University of California, Santa Cruz. 2017.

Reader for M.S. Project. Student: *Sumukh Atreya*. Department Computer Engineering, University of California, Santa Cruz. 2017.

Reader for M.S. Project. Student: *Vijay Muthukumaran*. Department Computer Engineering, University of California, Santa Cruz. 2017.

Master Thesis Committee Member. Student: *Dawn Hustig-Schultz*. Department Computer Engineering, University of California, Santa Cruz. 2017.

Qualifying Exam Committee Member. Student: *Andres Perico*. Department of Mathematics, University of California, Santa Cruz. 2017.

Ph.D. Dissertation Committee Member. Student: *Siyang Qin*. Department Computer Engineering, University of California, Santa Cruz. 2017.

Reader for M.S. Project. Student: *Hsin-Liang Liu*. Department Computer Engineering, University of California, Santa Cruz. 2016.

Ph.D. Dissertation Committee Member. Student: *Steven Lessard*. Department Computer Engineering, University of California, Santa Cruz. 2016.

Ph.D. Dissertation Committee Member. Student: *Jeremy Coupe*. Department Computer Engineering, University of California, Santa Cruz. 2016.

Ph.D. Dissertation Committee Member. Student: *Christopher O'Donnell*. Department Computer Engineering, University of California, Santa Cruz. 2014.

Ph.D. Dissertation Committee Member. Student: *Sean Whitsitt*. Department of Electrical and Computer Engineering, University of Arizona. 2014.

Ph.D. Dissertation Committee Member. Student: *Diyang Chu*. Department of Electrical and Computer Engineering, University of Arizona. 2013.

Ph.D. Dissertation Committee Member. Student: *Francesco Fichera*. LAAS-CNRS, Toulouse, France. 2013.

Ph.D. Dissertation Committee Member. Student: *Gibin Gil*. Department of Aerospace and Mechanical Engineering, University of Arizona. 2013.

Ph.D. Dissertation Committee Member. Student: *Domagoj Tolic*. Department of Electrical and Computer Engineering, University of New Mexico. 2012.

Ph.D. Dissertation Committee Member. Student: *Joseph Dinius*. Program in Applied Mathematics, University of Arizona. 2012.

Ph.D. Dissertation Committee Member. Student: *Theresa Klein*. Department of Electrical and Computer Engineering, University of Arizona. 2011.

Ph.D. Dissertation Committee Member. Student: *Wei Wang*. Department of Electrical and Computer Engineering, University of Melbourne, Australia. 2011.

Master Thesis Committee Chair. Student: *Sean Phillips*. Department of Aerospace and Mechanical Engineering, University of Arizona. 2013.

Master Thesis Committee Chair. Student: *Alexander Jacobs*. Department of Electrical and Computer Engineering, University of Arizona. 2013.

Master Thesis Committee Chair. Student: *Xiaolu Tian*. Department of Aerospace and Mechanical Engineering, University of Arizona. 2013.

Master Thesis Committee Chair. Student: *Qin Shu*. Department of Aerospace and Mechanical Engineering, University of Arizona. 2012.

Master Thesis Committee Chair. Student: *Manuel Robles*. Department of Aerospace and Mechanical Engineering, University of Arizona. 2011.

Master Thesis Committee Member. Student: *Gunjan Maniar*. Department of Aerospace and Mechanical Engineering, University of Arizona. 2011.

Master Thesis Committee Member. Student: *Vince Glowacka*. Department of Aerospace

and Mechanical Engineering, University of Arizona. 2009.

Graduate Study Program and Research Committee. Department of Aerospace and Mechanical Engineering, University of Arizona. 2009-present.

Shop Committee. Department of Aerospace and Mechanical Engineering, University of Arizona. 2009-present.

Arizona's Science, Engineering, and Mathematics Scholars (ASEMS) Mentor. Student: *Sheng-Shuan Yeh*. University of Arizona. 2012-2013, 2012-2014.

Arizona Assurance Mentor. Student: *Jasmine Thomas*. University of Arizona. 2013-2014.

Arizona Assurance Mentor. Student: *Phillip Mendoza*. University of Arizona. 2012-2013.

Arizona Assurance Mentor. Student: *Rafael Haro*. University of Arizona. 2011-2012.

Arizona Assurance Mentor. Student: *Austin Fox*. University of Arizona. 2011-2012.

Arizona Assurance Mentor. Student: *Aaron Jacobi*. University of Arizona. 2010-2011.

Arizona Assurance Mentor. Student: *Matthew Cartwright*. University of Arizona. 2010-2011.

Arizona Assurance Mentor. Student: *Carlos Lopez*. University of Arizona. 2009-2010.

Arizona Assurance Mentor. Student: *Sarah Ready*. University of Arizona. 2009-2010.

18 Outreach Activities

Lab tour and demonstration, STEM Transfer Day, University of California, Santa Cruz, CA. November 9, 2018.

Lab demonstration, Girls in Engineering, University of California, Santa Cruz, CA. July 7, 2018.

Lab tour and demonstration, Alumni Weekend, University of California, Santa Cruz, CA. April 28, 2018.

Lab tour and demonstration, STEM Transfer Day, University of California, Santa Cruz, CA. April 6, 2018.

Lab demonstration, Girls in Engineering, University of California, Santa Cruz, CA. July 13 and 18, 2017.

Presentation and lab demonstration, Society of Hispanic Professional Engineers, University of California, Santa Cruz, CA. May 30, 2017.

Lab tour and demonstration, MESA achievement day held by University of California, Santa Cruz, CA. April 22, 2017.

Presentations and demonstrations, Girls in Engineering, University of California Santa Cruz, CA. June 23 and 30, 2016.

Lab tour and demonstration, Alumni Weekend, University of California Santa Cruz, CA. April 4, 2016.

Lab tour and demonstration, MESA achievement day held by University of California, Santa Cruz, CA. March 5, 2016.

High School Internship, Catalina Foothills High School, University of Arizona, Tucson, AZ. Summer, 2014

Lab tour and demonstration, Phoenix Union High School students, University of Arizona, Tucson, AZ. November 5, 2013.

Lab tour and demonstration, Raytheon visitors, University of Arizona, Tucson, AZ. July 19, 2013.

Lab tours and demonstrations, Summer Engineering Camp, University of Arizona, Tucson, AZ. June, 2013.

Lab tour and demonstration, prospective AME graduate students during AME Recruitment Event for Fall 2013 candidates, University of Arizona, Tucson, AZ. March 22, 2013.

Lab tour and demonstration, prospective international undergraduate student through Recruitment-Retention/Outreach Office, University of Arizona, Tucson, AZ. March 22, 2013.

Lab tour and demonstration, AUVSI Chapter, University of Arizona, Tucson, AZ. March 21, 2013.

Lab tour and demonstration, Yuma Proving Grounds, University of Arizona, Tucson, AZ. November 27, 2012.

Lab tours and demonstrations for High School Students, University of Arizona, Tucson, AZ. October 26 and 30, and November 10, 2012.

Lab tours and demonstrations for Freshmen, University of Arizona, Tucson, AZ. September 12, 13, 26, and 28, 2012.

Lab tours and demonstrations, Summer Engineering Academy, University of Arizona, Tucson, AZ. June 8, 15, and 22, and July 13, 2012.

Summer Research Internship for High School Students, University of Arizona, Tucson, AZ. June 4 - June 29, 2012.

Training Lecture on Control Engineering, Mathematics Engineering Science Achievement Program, University of Arizona, Tucson, AZ. August 27, 2011.

Advisor in NASA Space Grant for Undergraduate Student from the Society of Hispanic Professional Engineers (SHPE), University of Arizona, Tucson, AZ. Fall 2010 and Spring 2011.

Summer Research Internship for High School Students, University of Arizona, Tucson, AZ. June 6 - June 17, 2011.

Participation in Yong Latina Forum, Society of Hispanic Professional Engineers (SHPE), University of Arizona, Tucson, AZ. February 4, 2011.

Participation in Advancement of Latinos in Engineering Day, Society of Hispanic Professional Engineers (SHPE), University of Arizona, Tucson, AZ. February 4, 2011.

Summer Research Internship for High School Students, University of Arizona, Tucson, AZ. June 7 - June 18, 2010.

Training Lecture on Control Engineering, Mathematics Engineering Science Achievement Program, University of Arizona, Tucson, AZ. January 23, 2010.

Summer Research Internship for Undergraduate Students from the Society of Hispanic Professional Engineers (SHPE), University of Arizona, Tucson, AZ. Summer, 2009.

Visit to Palo Verde High Magnet School, Tucson, AZ. December 4, 2009.

Lab tour by Palo Verde High Magnet School students, University of Arizona, Tucson, AZ. October 2, 2009.

Lecture on Control Engineering to middle and high school students, Algebra Academy Program, University of Arizona, Tucson, AZ. June 30, 2009.

Training Lecture on Control Engineering to high school students, Summer Engineering Academy, University of Arizona, Tucson, AZ. June 24, 2009.

Training Lecture on Control Engineering to middle school students, Summer Engineering Robotics Camp, University of Arizona, Tucson, AZ. June 2 and 9, 2009.

19 News and Media Articles

- [1] Video featuring the work on Cyber-Physical Systems at our lab, University of California, Santa Cruz, Spring 2016.
[SOE News](#)
- [2] Article featuring our new NSF CPS project entitled Computationally Aware Cyber-Physical Systems, University of California, Santa Cruz, Fall 2015.
[SOE News](#)
- [3] Article featuring our research at the University of California, Santa Cruz, Fall 2014.
[UCSC News](#)
- [4] SIAM press release the SIAM Control Theory Prize Award, Fall 2013.
[SIAM Connect](#)
- [5] Article featuring SIAM Control Theory Prize Award, entitled UA Engineering's Ricardo Sanfelice Wins Global Award for Control Systems Modeling, Summer 2013.
[Arizona Engineer Online](#)
<http://enr.arizona.edu/news/story.php?id=610>
- [6] Article featuring Star Award Educator of the Year, Fall 2012.
[SHPE Magazine](#)
<http://www.nxtbook.com/nxtbooks/shpe/conference12/index.php#/44>
- [7] Article featuring NSF CAREER Award and AFOSR YIP Award, Spring 2012.
[Arizona Engineer Online](#)
<http://www.engineering.arizona.edu/news/story.php?id=485>
- [8] Article featuring some research at the University of Arizona on UAVs/drones, Spring 2012.
[FOX News](#)
- [9] Article featuring AFOSR YIP Award, Spring 2012.
[Arizona Engineer Online](#)
- [10] Article featuring underwater robotics project at the Hybrid Dynamics and Control Lab (HDC Lab), Summer 2011.
[UA News](#)

- [11] Arizona Engineer, College of Engineering, Spring 2011.
<http://www.engineering.arizona.edu/news/printeditions/2011/AEspring2011.pdf>
- [12] Article featuring the HDC Lab, Spring 2011.
[UA News](#)
[Product Design & Development](#)
[PhysOrg.com](#)
[Science News Daily](#)
[Science Blog](#)
[Robotics Trends](#)
- [13] Coverage of Southwest Workshop on Theory and Applications of Cyber-Physical Systems, College of Engineering, Spring 2011.
<http://enr.arizona.edu/news/story.php?id=263>
- [14] University of Arizona Foundation, UA Engineering Communications Office, September 2009.
http://uafoundation.org/impact/articles/article_00040.shtml

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