

# JOÃO P. HESPANHA

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## EDUCATION

- Ph.D.**, Electrical Engineering, YALE UNIV., New Haven, CT 1998  
Ph.D. Adviser: Prof. A. Stephen Morse  
Dissertation Title: *Logic-Based Switching Algorithms in Control*
- M.S.**, Electrical and Computer Engineering, 1993  
INSTITUTO SUPERIOR TÉCNICO, Lisbon, Portugal, 1993  
M.S. Thesis Adviser: Prof. António M. Pascoal  
Dissertation Title: *Periodic and multi-rate controllers for linear time-invariant systems*
- Licenciatura**, Electrical and Computer Engineering, 1991  
INSTITUTO SUPERIOR TÉCNICO, Lisbon, Portugal

## TEACHING EXPERIENCE

- Professor** 2006–  
UNIV. OF CALIFORNIA, Dept. of Electrical and Computer Engineering, Santa Barbara, USA.
- Associate Professor** 2002–2006  
UNIV. OF CALIFORNIA, Dept. of Electrical and Computer Engineering, Santa Barbara, USA
- Assistant Professor** 1999–2001  
UNIV. OF SOUTHERN CALIFORNIA, Dept. of Electrical Engineering, Los Angeles, USA
- Academic Personnel Management and Instructor** 1989–1991  
FUNDO PARA O DESENVOLVIMENTO TECNOLÓGICO (Fund for Technological Development), Lisbon, Portugal

## SELECTED UNIVERSITY POSITIONS

- Director** 2011–  
CENTER FOR CONTROL, DYNAMICAL-SYSTEMS, AND COMPUTATION (CCDC), Univ. of California, Santa Barbara, USA
- Associate Director** 2005–2011  
CENTER FOR CONTROL, DYNAMICAL-SYSTEMS, AND COMPUTATION (CCDC), Univ. of California, Santa Barbara, USA
- Vice Chair & Graduate Advisor** 2007–  
DEPT. OF ELECTRICAL AND COMPUTER ENGINEERING, Univ. of California, Santa Barbara, USA
- Task-Order Leader and Executive Committee Member** 2005–  
INST. FOR COLLABORATIVE BIO-TECHNOLOGIES (ICB), Univ. of California, Santa Barbara, USA  
The ICB is a Univ. Affiliated Research Center (UARC) sponsored by the US Army with an initial grant of roughly \$50 million over 5 years, which has been extended for 5 additional years.

<b>Executive Committee Chair</b>	2004–2006
COLLEGE OF ENGINEERING, Univ. of California, Santa Barbara, USA	
<b>Council on Planning and Budget</b>	2010–
ACADEMIC SENATE, Univ. of California, Santa Barbara, USA	
<b>Research Review Committee Chair</b>	2005
DEPT. OF ELECTRICAL AND COMPUTER ENGINEERING, Univ. of California, Santa Barbara, USA	

#### OTHER WORK EXPERIENCE

<b>Visiting Post-doctoral Research Engineer</b>	1998–1999
UNIV. OF CALIFORNIA AT BERKELEY, Berkeley, CA	
<b>Partner</b>	1992–1993
SOCIEDADE DE PROJECTOS EM SISTEMAS E COMPUTADORES, LDA. (Society for Projects in Systems and Computers), Lisbon, Portugal	

#### AWARDS AND RECOGNITIONS

5504 citations in the ISI Web of Science (<http://apps.isiknowledge.com/>), as of October 2012.

2011 *Plenary Speaker* at the XIV Workshop on Information Processing and Control (RPIC'2011), Oro Verde, Argentina. RPIC has been held every other year since 1985 and is the main Argentinian meeting on Signal Processing and Control.

2010 **Semi-plenary Speaker** at the 49th IEEE Conference on Decision and Control (CDC'2010). CDC is the annual meeting of the IEEE Control Systems Society.

2010 **Keynote Speaker** at the 52th Turkish National Symposium on Automatic Control (TOK'2010). TOK is the annual symposium of the Turkish National Committee of Automatic Control, which is the National Member Organization of the International Federation of Automatic Control (IFAC).

2009 **Ruberti Young Researcher Prize** with the citation “for fundamental contributions to adaptive control and to the theory of switched and hybrid systems.” This award recognizes contributions by a researcher under the age of 41 in the broad field of systems and control. This IEEE Control Systems Society award is funded by the Antonio Ruberti Foundation.

2009 **Semi-plenary Speaker** at the Chinese Control and Decision Conference (CCDC), Guilin. CCDC is a premier annual control conference in China, with 108 technical sessions and over 1200 papers from China and abroad.

2009-2011 **Elected member of the IEEE Control Systems Society (CSS) Board of Governors (BoG)**. Elected members of the CSS BoG are selected by vote among the 10,000 plus members of the society.

2008 **IEEE Fellow** with the citation “for contributions to stability techniques for switched and hybrid systems.” The grade of Fellow is conferred by the IEEE Board of Directors upon a person with an extraordinary record of accomplishments that have contributed importantly to the advancement or application of engineering, science and technology.

2008 **Appointed member of the IEEE Control Systems Society (CSS) Board of Governors (BoG)**. Appointed members of the CSS BoG are invited by the CSS president elect.

2007-2011 **IEEE Distinguished Lecturer**.

Invited to give a week-long course on “Modeling Analysis and Design of Hybrid Control Systems” at the HYCON European Embedded Control Institute (HYCON-EECI), Supelec, Gif sur Yvette, France, Feb. 2007.

2006 **George S. Axelby Outstanding Paper Award** for the paper “Uniform stability of switched linear systems: extensions of LaSalle’s Invariance Principle.” *IEEE Trans. on Automat. Contr.*, 49(4):470–482, Apr. 2004. This prize is awarded annually by the IEEE Control Systems Society to recognize outstanding papers published in the IEEE Transactions on Automatic Control.

Invited to give a two-day Mini-Course on “Hybrid Control Systems” at the 17th Int. Symposium on Mathematical Theory of Networks and Systems (MTNS’06), Kyoto, Japan, July 24–28, 2006.

2005 **Best Paper Award at the 2nd Int. Conf. on Intelligent Sensing and Information Processing** for the paper “Estimation from relative measurements: Error bounds from electrical analogy,” with (P. Barooah), Jan. 2005.”

2002–2004 **Automatica Theory/Methodology Best Paper Prize** for the paper “J. P. Hespanha and A. S. Morse. Switching between stabilizing controllers. *Automatica*, 38(11), Nov. 2002.” This prize is awarded once every three years by the Int. Federation of Automatic Control to the best theory/methodology paper published in the previous three years in the journal *Automatica*.

2002 **Plenary Speaker** at the 5th Portuguese Conference on Automatic Control (Controlo 2002), Univ. of Aveiro, September 5, 2002. Talk entitled “Switched Systems: Mixing Logic with Differential Equations.”

2001 **National Science Foundation (NSF) Faculty Early Career Development (CAREER) award**. The CAREER award is NSF’s most prestigious honor for junior faculty members.

1999 (Fall) **USC’s Faculty Honor Roll**. The faculty honor roll recognizes faculty that obtained exceptional scores in teaching evaluations.

1999 **Yale University’s Henry Prentiss Becton Graduate Prize** for exceptional achievement in research in Engineering and Applied Science for the PhD thesis *Logic-Based Switching Algorithms in Control*. PhD Thesis, Yale Univ., New Haven, CT, 1998.

1991–1993, Master’s Fellowship, Junta Nacional de Investigação Científica e Tecnológica.

1990 Young Researcher Fellowship, Junta Nacional de Investigação Científica e Tecnológica (National Commission for Scientific and Technological Investigation).

## ORGANIZATION OF WORKSHOPS AND CONFERENCES

Co-chair of the 3rd IFAC Workshop on Distributed Estimation and Control in Networked Systems (NECSYS’12), Sep. 2012 (with F. Bullo).

Organizer of the workshop on “Multiple Vehicle Motion Planning, Navigation, and Control — Theory and Practice” for the 2011 World Congress of Int. Federation of Automat. Control (IFAC) in Milan, Italy, Aug. 2011 (with A. Pedro Aguiar, Antonio M. Pascoal and Isaac Kaminer).

Organizer of the workshop on “Cooperative Control of Multiple Autonomous Vehicles” for the 2008 World Congress of Int. Federation of Automat. Control (IFAC) in Seoul, Korea, July 2008 (with A. Pedro Aguiar, Antonio M. Pascoal and Isaac Kaminer).

Chair of the Ninth Int. Workshop on Hybrid Systems: Computation and Control (HSCC’06), Mar 2006.

Organizer of the workshop on “New Developments in Point-Stabilization, Trajectory-Tracking, Path-following, and Formation Control of Autonomous Vehicles” for the 45th Conference on Decision and Control in San Diego, CA, Dec. 2006 (with A. Pedro Aguiar and Antonio M. Pascoal).

Organizer of an invited session on “Novel Techniques for the Analysis and Control of Hybrid Systems” for the 2004 American Control Conference (ACC’04), Boston, MA, June 2004 (with N. El-Farra).

Organizer of an invited session on “Control and Estimation Methods in Network Security and Survivability” for the 2004 American Control Conference (ACC’04), Boston, MA, June 2004 (with J. Cabrera).

Organizer of an invited session on “Switching and Logic in Control” for the First Int. Symposium on Control, Communications, and Signal Processing (ISCCSP’04), Hammamet, Tunisia, Mar. 2004.

Co-founder and organizer of the biannual “Southern California Nonlinear Control Workshop Series,” San Diego/Los Angeles/Santa Barbara, June 2001–present (with M. Krstic, R. Murray, C. Panagiotis, and A. Teel).

Organizer of two tutorial sessions on “Logic-Based Control” for the 10th Mediterranean Conference on Control and Automation (MED’02), Lisbon, Portugal, July 2002 (with D. Liberzon).

Organizer of the workshop on “Control using Logic and Switching” for the 40th Conference on Decision and Control in Orlando (CDC’01), Florida, Dec. 2001 (with D. Liberzon and A. S. Morse).

Organizer and program chair of the Conference “Touch in Virtual Environments,” Los Angeles, California, Feb. 2001 (with M. McLaughlin and G. Sukhatme). This was a one-day conference on haptics sponsored by the Integrated Media Systems Center and the Annenberg School for Communication, Univ. of Southern California, Los Angeles.

Organizer of the workshop on “Unmanned Air Vehicles: Coordination, Sensing, and Control” for the 38th Conference on Decision and Control in Phoenix, Arizona, Dec. 1999 and of the Int. Conference of Control Applications—International Symposium on Computer-Aided Control System Design in Anchorage, Alaska, Sep. 2000 (with C. Tomlin and S. Sastry).

Organizer and lecturer at the mini-course on “System Theory on the Eve of the 21st Century” for Arrábida Courses Summer Univ., Arrábida, Portugal, June 1999 (with A. S. Morse).

Organizer of the invited session on “Vision and Control” for the 37th Conference on Decision and Control in Tampa, Florida, Dec. 1998 (with J. Košecák).

#### CONFERENCE PROGRAM COMMITTEE SERVICE

Member of the technical program committee of the Cyber-physical Systems Track at the Design, Automation and Test in Europe (DATE) Conference, 2013.

Member of the Program Committee of the 51st IEEE Conference on Decision and Control (CDC’12), Maui, Hawaii, Dec. 2012.

Member of the international program committee of the 10th Portuguese Conference on Automatic Control (Controlo’12), Funchal, Madeira, July 2012.

Member of the international program committee of the 2012 IFAC Conference on Analysis and Design of Hybrid Systems (ADHS’12), Eindhoven, The Netherlands, June 2012.

Member of the program committee of the 50th IEEE Conference on Decision and Control (CDC’11), Orlando, Florida, Dec. 2011.

Member of the technical program committee of the 23rd Chinese Control and Decision Conference (2011 CCDC), Mianyang of Sichuan Province, China, May 2011.

Member of the technical program committee of the 2nd Workshop on Distributed Estimation and Control in Networked Systems (NecSys’10), Annecy, France, Sep. 2010.

Member of the Int. Technical Program Committee of the 4th Int. Symposium on Control, Communications, and Signal Processing (ISCCSP’10), Limassol, Cyprus, Mar. 2010.

Member of the technical program committee of the 22nd Chinese Control and Decision Conference (2010 CCDC), Xuzhou, China, May 2010.

Member of the technical program committee of the first Workshop on Distributed Estimation and Control in Networked Systems, Venice, Italy, Sep. 2009.

Member of the organizing committee of the SIAM Conference on Control Theory and its Applications which will be held in conjunction with the SIAM Annual Meeting, Denver, Colorado, July 2009.

Member of the technical program committee of the Control over Communication Channels Workshop (Con-Com'09), Seoul, Korea, June 2009.

Member of the international program committee of the Eighth Portuguese Conference on Automatic Control (Controlo'08), Vila Real, Portugal, July 2008.

Member of the program committee of the Int. Workshop on Hybrid Systems: Computation and Control (HSCC'08), St. Louis, MO, Apr. 2008.

Member of the program committee of the 2007 American Control Conference (ACC'07), New York, NY, July 2007.

Member of the technical program committee of the workshop Control over Communication Channels (Con-Com'07), Limassol, Cyprus, Apr. 2007.

Member of the program committee of the Int. Workshop on Hybrid Systems: Computation and Control (HSCC'07), Pisa, Italy, Apr. 2007.

Member of the international program committee of the Seventh Portuguese Conference on Automatic Control (Controlo'06), Lisbon, Portugal, Sep. 2006.

Member of the international program committee of the Symposium on Mathematical Theory of Network and Systems (MTNS'06), Kyoto, Japan, July 2006.

Member of the program committee of the 2006 American Control Conference (ACC'06), Minneapolis, Minnesota, June 2006.

Member of the program committee of the Int. Conference on Computer Vision (ICCV'05) Workshop on Dynamical Vision, Beijing, China, Oct. 2005.

Member of the program committee of the Workshop on Networked Embedded Sensing and Control (NESC'05), Univ. of Notre Dame, South Bend, USA, Oct. 2005.

Member of the program committee of the Int. Workshop on Hybrid Systems: Computation and Control (HSCC'05), Zurich, Switzerland, Mar. 2005.

Member of the program committee of the 43rd IEEE Conference on Decision and Control (CDC'04), Paradise Island, Bahamas, Dec. 2004.

Member of the international program committee of the IEEE Int. Symposium on Intelligent Control (ISIC'04), Taipei, Taiwan, Sep. 2004.

Member of the program committee of the first International Conference on Informatics in Control, Automation and Robotics (ICINCO'04), Setúbal, Portugal, Aug. 2004.

Member of the international program committee of the RoboCup 2004 Symposium, Lisbon, Portugal, June 2004.

Member of the international program committee of the Sixth Portuguese Conference on Automatic Control (Controlo'04), Faro, Portugal, June 2004.

Member of the technical program committee of the First Int. Symposium on Control, Communications, and Signal Processing (ISCCSP'04), Hammamet, Tunisia, Mar. 2004.

Member of the international program committee of the RoboCup 2003 Symposium, Padova, Italy.

Member of the technical program committee of the 2002 American Control Conference (ACC'02), Anchorage, Alaska, USA, June 2002.

Member of the program committee of the Hybrid Systems: Computation and Control (HSCC'02) fifth Int. Workshop, Stanford, California, USA, May 2002.

Member of the international program committee of the RoboCup 2002 Conference, Fukuoka, Japan and Busan, South Korea, together with the RoboCup soccer and rescue competitions.

Member of the program committee of the Forth Portuguese Conference on Automatic Control (Controlo'02), Aveiro, Portugal.

Member of the international program committee of the 10th Mediterranean Conference on Control and Automation (MED'02), Lisbon, Portugal, 2002.

Member of the international program committee of the 14th IEEE Int. Symposium on Intelligent Control/Intelligent Systems and Semiotics (ISIC/ISS'99), Cambridge, Massachusetts, 1999.

## REVIEWING AND PANELING ACTIVITIES

Chair of the 2010 and of the 2011 Portuguese Foundation for Science and Technology (FCT) review panel for research projects in the Electrical Engineering area (including Computer Engineering, Telecommunication, Energy, Automation, Control and Robotics). FCT is the Portuguese governmental organization that selects and distributes research funds in a large number of scientific fields of research. Panel chairs are invited by the president of FCT.

Chair of the 2007 and 2009 Portuguese Foundation for Science and Technology (FCT) review panel for research projects in the area of Automation, Control and Robotics (ACR). FCT is the Portuguese governmental organization that selects and distributes research funds in a large number of scientific fields of research. Panel chairs are invited by the president of FCT.

Chair of the National Science Foundation Review Panel for the "Computational Modeling and Analysis for Complex Systems (CMACS)" Expeditions in Computing Program, Nov. 2011.

Member of the Control Systems Society Committee on Ethics in Publishing, since Jan. 2012.

Member of the George S. Axelby Outstanding Paper Award IEEE Control Systems Society Committee for multiple years.

Member of a University of Cyprus promotion committee, Sep. 2011 – Mar. 2012.

Member of the panel for the Student Best Paper Award for the 51th IEEE Conf. on Decision and Control, Maui, Hawaii, USA, Dec. 2012; 50th IEEE Conf. on Decision and Control, Orlando, Florida, USA, Dec. 2011; 48th IEEE Conf. on Decision and Control, Shanghai, China, Dec. 2009; 47th IEEE Conf. on Decision and Control, Cancun, Mexico, Dec. 2008; 42nd IEEE Conf. on Decision and Control, Maui, Hawaii, USA, Dec. 2003; 39th IEEE Conf. on Decision and Control, Sydney, Australia, Dec. 2000; 38th IEEE Conf. on Decision and Control, Phoenix, Arizona, USA, Dec. 1999.

Reviewer for research funding proposals submitted to the Air Force Office of Scientific Research, 2007, 2008.

Reviewer for the Swedish Research Council (VR), 2008, 2010.

Reviewer for the Council of Physical Sciences of the Netherlands Organization for Scientific Research (NWO), 2005 and 2007.

Member of the panel for the Student Best Paper Award for the 2007 American Control Conference (ACC'07), New York, NY, July 2007.

Member of an American Automatic Control Council (AACC) award panel, 2005.

Reviewer for research funding proposals submitted to the Army Research Office, 2000.

## OTHER PROFESSIONAL ACTIVITIES

Vice Chair of the Int. Federation of Automatic Control (IFAC) Technical Committee on Networked Systems, 2009–2011 and 2012–2014.

Member of the IFAC Technical Committee 1.3 on Discrete Event and Hybrid Systems, 2011–2014.

Member of the IEEE Control Systems Society Technical Committee on Computational Aspects of Control Systems Design (TC-CACSD), 2011.

Associate editor of the IEEE Transactions on Automatic Control, 2004–2007.

Participant in the UNESCO's Encyclopedia of Life Support Systems (EOLSS) as an article-level writer for Article 6.43.28.7. "Stabilization through Hybrid Control", 2000–04.

Guest editor for the special issue on "Recent Trends on the Use of Switching and Mixing in Adaptive Control" for the *Int. Journal of Adaptive Control and Signal Processing*, Volume 26, number 8, Aug. 2012 (with A. Casavola and P. Ioannou).

Guest editor for the special issue on "Switching and Logic in Adaptive Control" for the *Int. Journal of Adaptive Control and Signal Processing*, 2000–01 (with D. Liberzon).

## MEMBERSHIP IN PROFESSIONAL SOCIETIES

Member of the Institute for Electrical and Electronics Engineers (IEEE) since 1995. Elevated to the grade of Fellow in 2008.

Member of the Sigma Xi Scientific Research Society since 1998.

Member of the Ordem dos Engenheiros (the Portuguese engineering professional society) since 1993.

## PATENTS

"A Method of Face Recognition Using Class Specific Linear Projection," provisional patent application (with P. Belhumeur and D. Kriegman).

## PUBLICATIONS<sup>1</sup>

### BOOKS AND SPECIAL ISSUES

J. P. Hespanha. *Linear Systems Theory*. Princeton Press, Sept. 2009. ISBN13: 978-0-691-14021-6. Information about the book, an errata, and exercises are available at <http://www.ece.ucsb.edu/~hespanha/linearsystems/>.

J. P. Hespanha and A. Tiwari, editors. *Hybrid Systems: Computation and Control*, vol. 3927 of *Lect. Notes in Comput. Science*. Springer-Verlag, Mar. 2006.

M. L. McLaughlin, J. P. Hespanha, and G. Sukhatme, editors. *Touch in virtual environments: Haptics and the Design of Interactive Systems*. Prentice Hall/IMSC Press Multimedia Series, 2002.

J. P. Hespanha and D. Liberzon, editors. *Int. J. of Adaptive Contr. and Signal Processing*, Special Issue on Switching and Logic, vol. 15. Wiley & Sons, May 2001.

<sup>1</sup>Most publications are available online at <http://www.ece.ucsb.edu/~hespanha/published.html>

## BOOK CHAPTERS AND ARTICLES IN COLLECTIONS

- P. Naghshtabrizi and J. P. Hespanha. Implementation considerations for wireless networked control systems. In S. K. Mazumder, editor, *Wireless Network Based Control*, pp. 1–27. Springer, 2011.
- J. P. Hespanha and F. D. III. Bio-inspired network science. In R. E. Armstrong, M. D. Drapeau, C. A. Loed, and J. J. Valdes, editors, *Bio-Inspired Innovation and National Security*, chapter 19, pp. 281–290. National Defense University Press, 2010.
- P. Barooah, W. J. Russell, and J. P. Hespanha. Approximate distributed Kalman filtering for cooperative multi-agent localization. In R. Rajaraman, T. Moscibroda, A. Dunkels, and A. Scaglione, editors, *Distributed Computing in Sensor Systems*, Lect. Notes in Comput. Science, pp. 102–115. Springer, June 2010.
- R. Cogill, S. Lall, and J. P. Hespanha. A constant factor approximation algorithm for event-based sampling. In J. C. Willems, S. Hara, Y. Ohta, and H. Fujioka, editors, *Perspectives in Mathematical System Theory, Control, and Signal Processing*, number 398 in Lecture Notes in Control and Information Sciences, chapter A Constant Factor Approximation Algorithm for Event-Based Sampling, pp. 51–60. Springer-Verlag, Mar. 2010.
- A. P. Aguiar, J. P. Hespanha, and P. V. Kokotović. Zero dynamics and tracking performance limits in nonlinear feedback systems. In A. Astolfi and L. Marconi, editors, *Analysis and Design of Nonlinear Control Systems*, pp. 149–159. Springer Verlag, 2008.
- C. Lim, S. Bohacek, J. P. Hespanha, and K. Obraczka. On the effectiveness of proactive path-diversity based routing for robustness to path failures. In A. Das, H. K. Pung, F. B. S. Lee, and L. W. C. Wong, editors, *Networking 2008: Ad Hoc and Sensor Networks, Wireless Networks, Next Generation Internet*, vol. 4982 of *Lect. Notes in Comput. Science*, pp. 574–585. Springer, May 2008.
- A. R. Mesquita, J. P. Hespanha, and K. Åström. Optimotaxis: A stochastic multi-agent on site optimization procedure. In M. Egerstedt and B. Mishra, editors, *Hybrid Systems: Computation and Control*, number 4981 in *Lect. Notes in Comput. Science*, pp. 358–371. Springer-Verlag, Mar. 2008.
- J. P. Hespanha. Stochastic hybrid modeling of on-off TCP flows. In C. G. Cassandras and J. Lygeros, editors, *Stochastic Hybrid Systems: Recent Developments and Research Trends*, number 24 in *Control Engineering Series*, pp. 191–219. CRC Press, Nov. 2006.
- P. Barooah, N. M. da Silva, and J. P. Hespanha. Distributed optimal estimation from relative measurements for localization and time synchronization. In P. B. Gibbons, T. Abdelzaher, J. Aspnes, and R. Rao, editors, *Distributed Computing in Sensor Systems*, vol. 4026 of *Lect. Notes in Comput. Science*, pp. 266–281. Springer, June 2006. Presented at the Int. Conf. on Distributed Computing in Sensor Systems (DCOSS): Algorithms track.
- P. Naghshtabrizi and J. P. Hespanha. Anticipative and non-anticipative controller design for network control systems. In P. J. Antsaklis and P. Tabuada, editors, *Networked Embedded Sensing and Control*, vol. 331 of *Lect. Notes in Contr. and Inform. Sci.*, pp. 203–218. Springer, 2006.
- Y. Xu and J. P. Hespanha. Communication logic design and analysis for networked control systems. In L. Menini, L. Zaccarian, and C. T. Abdallah, editors, *Current trends in nonlinear systems and control*. Birkhäuser, 2006.
- J. P. Hespanha. Application and value of deception. In A. Kott and W. M. McEneaney, editors, *Adversarial Reasoning: Computational Approaches to Reading the Opponents Mind*. Taylor and Francis publishing house, 2006.
- J. P. Hespanha. Polynomial stochastic hybrid systems. In M. Morari and L. Thiele, editors, *Hybrid Systems: Computation and Control*, number 3414 in *Lect. Notes in Comput. Science*, pp. 322–338. Springer-Verlag, Mar. 2005.

- J. P. Hespanha. Stabilization through hybrid control. In *Encyclopedia of Life Support Systems (EOLSS)*, vol. Control Systems, Robotics, and Automation. Developed under the Auspices of the UNESCO, Eolss Publishers, 2004.
- J. P. Hespanha. Stochastic hybrid systems: Applications to communication networks. In R. Alur and G. J. Pappas, editors, *Hybrid Systems: Computation and Control*, number 2993 in Lect. Notes in Comput. Science, pp. 387–401. Springer-Verlag, Mar. 2004.
- J. P. Hespanha.  $\mathcal{L}_2$ -induced gains of switched linear systems. In V. D. Blondel and A. Megretski, editors, *Unsolved Problems in Mathematical Systems & Control Theory*, pp. 131–133. Princeton University Press, 2003.
- J. P. Hespanha. Computation of root-mean-square gains of switched linear systems. In C. J. Tomlin and M. R. Greenstreet, editors, *Hybrid Systems: Computation and Control*, number 2289 in Lect. Notes in Comput. Science, pp. 239–252. Springer-Verlag, Mar. 2002.
- M. L. McLaughlin, J. P. Hespanha, and G. Sukhatme. *Touch in virtual environments: Haptics and the Design of Interactive Systems*, chapter Introduction to Haptics. Prentice Hall/IMSC Press Multimedia Series, 2002.
- J. P. Hespanha, G. Sukhatme, and M. L. McLaughlin. *Touch in virtual environments: Haptics and the Design of Interactive Systems*, chapter Haptic Collaboration over the Internet. Prentice Hall/IMSC Press Multimedia Series, 2002.
- J. P. Hespanha, S. Bohacek, K. Obraczka, and J. Lee. Hybrid modeling of TCP congestion control. In M. D. D. Benedetto and A. Sangiovanni-Vincentelli, editors, *Hybrid Systems: Computation and Control*, number 2034 in Lect. Notes in Comput. Science, pp. 291–304. Springer-Verlag, Mar. 2001.
- J. P. Hespanha and A. S. Morse. Scale-independent hysteresis switching. In F. W. Vaandrager and J. H. van Schuppen, editors, *Hybrid Systems: Computation and Control*, vol. 1569 of *Lect. Notes in Comput. Science*, pp. 117–122. Springer-Verlag, Mar. 1999.
- J. P. Hespanha and A. S. Morse. Input-output gains of switched linear systems. In V. D. Blondel, E. D. Sontag, M. Vidyasagar, and J. C. Willems, editors, *Open Problems in Mathematical Systems Theory and Control*. Springer-Verlag, 1999.
- J. P. Hespanha, Z. Dodds, G. D. Hager, and A. S. Morse. What can be done with an uncalibrated stereo system? In D. J. Kriegman, G. D. Hager, and A. S. Morse, editors, *The Confluence of Vision and Control*, number 237 in Lect. Notes in Contr. and Inform. Sci., pp. 79–89. Springer-Verlag, 1998.

#### JOURNAL PUBLICATIONS

- J. T. Isaacs and J. Hespanha. Dubins traveling salesman problem with neighborhoods: A graph based approach. Submitted to journal publication, Oct. 2012.
- K. Roh, F. R. P. Safaei, J. P. Hespanha, and S. R. Proulx. Evolution of transcription networks in response to temporal fluctuations. Submitted to journal publication, July 2012.
- P. Tesi, G. Battistelli, J. P. Hespanha, and E. Mosca. Model-free adaptive switching control of time-varying plants. To appear in the *IEEE Trans. on Automatic Control*.
- F. R. Poursafaei, J. P. Hespanha, and G. Stewart. On controller initialization in multivariable switching systems. *Automatica*. To appear.
- D. Antunes, J. P. Hespanha, and C. Silvestre. Stability of networked control systems with asynchronous renewal links: An impulsive systems approach. *Automatica*. To appear.

- D. J. Klein, J. T. Isaacs, S. Venkateswaran, J. Burman, T. Pham, J. Hespanha, and U. Madhoo. Source localization in a sparse acoustic sensor network using UAVs as information seeking data mules. *IEEE Trans. on Sensor Networks*, 9(4), Nov. 2013.
- A. R. Mesquita and J. P. Hespanha. Jump control of probability densities with applications to autonomous vehicle motion. *IEEE Trans. on Automat. Contr.*, 57:2588–2598, Oct. 2012.
- A. R. Mesquita, J. P. Hespanha, and G. N. Nair. Redundant data transmission in control/estimation over lossy networks. *Automatica*, 48:1020–1027, Aug. 2012.
- W. J. Russell, P. Barooah, D. J. Klein, and J. P. Hespanha. Approximate distributed kalman filtering for cooperative multi-agent localization. Submitted to publication, Aug. 2012.
- A. R. Teel, J. P. Hespanha, and A. Subbaraman. Equivalent characterizations of input-to-state stability for stochastic discrete-time systems. Submitted to journal publication, May 2012.
- A. R. Teel, J. P. Hespanha, and A. Subbaraman. A converse lyapunov theorem for asymptotic stability in probability. Submitted to journal publication, Mar. 2012.
- G. Battistelli, J. P. Hespanha, and P. Tesi. Supervisory control of switched nonlinear systems. *Int. J. of Adaptive Control and Signal Processing*, Special Issue on Recent Trends on the Use of Switching and Mixing in Adaptive Control, 26(8):723–738, Aug. 2012.
- A. Casavola, J. Hespanha, and P. Ioannou. Special issue on recent trends on the use of switching and mixing in adaptive control. *Int. J. of Adaptive Control and Signal Processing*, Special Issue on Recent Trends on the Use of Switching and Mixing in Adaptive Control, 26(8):690–691, Aug. 2012.
- D. Antunes, J. P. Hespanha, and C. Silvestre. Stochastic hybrid systems with renewal transitions: Moment analysis with applications to networked control systems with delays. Submitted to journal publication, May 2012.
- Y. Mo, J. P. Hespanha, and B. Sinopoli. Resilient detection in the presence of integrity attacks. Submitted to journal publication, Apr. 2012.
- D. Antunes, J. P. Hespanha, and C. Silvestre. Volterra integral approach to impulsive renewal systems: Application to networked control. *IEEE Trans. on Automat. Contr.*, 57:607–619, Mar. 2012.
- J. R. Riehl, G. E. Collins, and J. P. Hespanha. Cooperative search by UAV teams: A model predictive approach using dynamic graphs. *IEEE Trans. Aerospace and Electronic Syst.*, 47:2637–2656, Oct. 2011.
- S. D. Bopardikar, A. Borri, J. P. Hespanha, M. Prandini, and M. D. D. Benedetto. Randomized sampling for large zero-sum games. To appear in *Automatica*.
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#### CONFERENCE PUBLICATIONS

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#### INVITED LECTURES

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## FORMER PHD STUDENTS

Dr. William (Josh) Russell, PhD, Univ. of California, Santa Barbara, May 2012. Dissertation Title: *Distributed Smoothing Based on Relative Measurements*.

Dr. Jason Isaacs, PhD, Univ. of California, Santa Barbara, March. 2012. Dissertation Title: *Dynamic Vehicle Routing Of UAV Data Mules In Sparse Sensor Networks*.

Dr. Duarte Antunes, PhD, Inst. Superior Tcnico, Lisbon, Portugal (co-advised with Prof. Carlos Silvestre), 2011.

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## CURRENT PHD STUDENTS

Steven Quintero, started PhD program in Fall 2007.

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