

Seth Hutchinson

Curriculum Vitae

ADDRESS

The Coordinated Science Laboratory
1308 W. Main Street
Urbana, IL 61801-2307

Phone: (217) 244-5570
E-mail: seth@illinois.edu

CURRENT POSITION

Professor of Electrical and Computer Engineering
Research Professor, Beckman Institute
Research Professor, Coordinated Science Laboratory
—*University of Illinois at Urbana-Champaign*, 2003-present

EDUCATION

Ph.D. Electrical Engineering, Purdue University, Dec. 1988
Master of Science, Electrical Engineering, Purdue University, Dec. 1984
Bachelor of Science, Electrical Engineering, Purdue University, May 1983

PREVIOUS POSITIONS (Including Visiting Appointments and Sabbatical Leaves)

- Sep-Dec, 2013: Università di Roma “La Sapienza”, Rome, Italy, *Visiting Professor*
- Oct, 2011: Tecnológico de Monterrey, Campus of Guadalajara, *Visiting Professor*
- Jun, 2008: L’Institut Français Mécanique Avancée, Clermont-Ferrand, France, *Visiting Professor*
- Sep-Oct, 2007: Université de Rennes I, Rennes France, *Invited Professor*
- 2001-2007: University of Illinois at Urbana-Champaign
 - Associate Head for Undergraduate Affairs, Electrical and Computer Engineering
- Jun 2005: Tecnológico de Monterrey, Campus Estado de México (June 2005), *Visiting Professor*
- Jan, 2005: The Australian National University, *Visiting Fellow*
- 1996-2003: University of Illinois at Urbana-Champaign
 - Associate Professor of Electrical and Computer Engineering
 - Research Assc. Professor, Beckman Institute
 - Research Assc. Professor, Coordinated Science Laboratory
- 1997-1998: Ecole Nationale Supérieure des Télécommunications, Paris, France, *Visiting Professor*
- 1990-1996: University of Illinois at Urbana-Champaign
 - Assistant Professor of Electrical and Computer Engineering
 - Research Asst. Professor, Beckman Institute
 - Research Asst. Professor, Coordinated Science Laboratory
- 1989: Purdue University
 - Visiting Assistant Professor of Electrical Engineering
- 1983-1988: Purdue University
 - Teaching and Research Assistant

RESEARCH INTERESTS

Robotics: Vision-based control, motion planning, planning under uncertainty, pursuit-evasion, localization and mapping, locomotion, bio-inspired robotics

TEACHING

- **Courses Developed:**
 - ◇ ECE 550 Advanced Robotic Planning
 - ◇ ECE 470 Introduction to Robotics (with Professors Spong and Ahuja)
 - ◇ ECE 379 Robot Sensing (with Professor Ahuja)
- **Course Instructor:**
 - ◇ Introduction to Robotics (ECE 470)
 - ◇ Advanced Robotic Planning (ECE 550)
 - ◇ Control Systems (ECE 486)
 - ◇ Control System Theory and Design (ECE 515)
 - ◇ Introduction to Optimization (ECE 490)
 - ◇ Senior Design Laboratory (ECE 445)
 - ◇ Introduction to Computing Systems (ECE 190)
 - ◇ Analog Signal Processing (ECE 210)
 - ◇ Computer Engineering I (ECE 290)
 - ◇ Probability with Engineering Applications (ECE 313)
 - ◇ Logic Design (ECE 462)
 - ◇ Engineering Ethics (ECE 316)
- **Tutorials**
 - ◇ “Visual Servo Control,” 9th Summer School on Image and Robotics 2008, IFMA, Campus des Cezeaux, France
 - ◇ “Visual Servo Control,” Centro de Investigación en Matemáticas, Guanajuato, Mexico (Feb. 2008)
 - ◇ “Visual Servo Control,” IEEE Int’l Conf. on Robotics and Automation, 1996
 - ◇ “Multisensor Fusion Under Uncertainty: Bayes Methods and the Dempster-Shafer Theory,” given at the IEEE Int’l Conf. on Multisensor Fusion and Integration for Intelligent Systems, 1994
- **Short Courses:**
 - ◇ Underactuated Robots, Università di Roma “La Sapienza”, Rome, Italy, Winter, 2016.
 - ◇ Probabilistic Methods in Robotics, Università di Roma “La Sapienza”, Rome, Italy, Fall, 2013.
 - ◇ Lectures on visual servo control and path planning at the Dutch Institute of Systems and Control (DISC) Summer School on Dynamics and Control Methods for Medical Robotics, June, 2011.
 - ◇ “Visual Servo Control,” Centro de Investigación en Matemáticas, Guanajuato, Mexico (Aug. 2009)
 - ◇ “Visual Servo Control,” Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, CINVESTAV, Saltillo, Mexico, (Feb. 2009)
 - ◇ *Robot Motion Planning*, a four week graduate course given at the Tecnológico de Monterrey, Campus Estado de México, June 2005
 - ◇ *Robotics and Computer Vision*, a three day short course offered through the Office of Continuing Engineering Education at the University of Illinois, Summer 1993 (with Professor Ponce)

PROFESSIONAL ACTIVITIES

- **Editorships**
 - ◇ Editorial Board, *International Journal of Robotics Research*, 2005-present
 - ◇ Advisory Editorial Board, *Journal of Intelligent Service Robotics*, 2014-present
 - ◇ Editor-in-Chief, *IEEE Transactions on Robotics*, 2008-2013
 - ◇ Founding Editor-in-Chief, Conference Editorial Board, IEEE Robotics and Automation Society 2006-2008
 - ◇ Editorial Board, *Journal of Intelligent Service Robotics*, 2005-2014
 - ◇ Editor, *IEEE Transactions on Robotics and Automation*, 2000-2005
 - ◇ Associate Editor, *IEEE Transactions on Robotics and Automation* 1997-2000
 - ◇ Guest Editor, *International Journal of Computer Vision* and *International Journal of Robotics Research: Joint Special Issue on Vision and Robotics*, Nov., 2007

- ◇ Guest Editor, *International Journal of Robotics Research*, Jul.-Aug. 2004
- ◇ Guest Editor, *IEEE Transactions on Robotics and Automation*, Special section on visual servo control, October 1996
- **IEEE Robotics and Automation Society, Offices and Committees**
 - ◇ Member of the AdCom, 2006-2009, 2014-2016, 2017-present (at-large member)
 - ◇ Member, Conference Activities Board (CAB), 2016-present
 - ◇ Chair, CAB Technical Programs Committee, 2016-present
 - ◇ Associate Vice President for Conference Technical Programs, 2016-present
 - ◇ Chair of the Steering Committee of *IEEE Robotics and Automation Letters*, 2015-present
 - ◇ Director, IEEE RAS Young Reviewers Program, 2015-present
 - ◇ Member of the ad hoc Committee on New Publication Strategies, 2014-present
 - ◇ Member of the Electronic Publications and Services Board, 2014-2015
 - ◇ Member of the Publications Activities Board (PAB), 2008-present
 - ◇ Member of the IEEE Fellow Nomination Committee, 2012-2015
 - ◇ Chair, IEEE Fellow Nomination Committee, 2016, 2017
 - ◇ Member of the search committee: Editor-in-Chief of *IEEE Robotics and Automation Letters*, 2015
 - ◇ Co-Chair, Evaluation Panel for the George Saridis Leadership Award in Robotics and Automation, 2014, 2015
 - ◇ Co-Chair, Evaluation Panel for the George Saridis Distinguished Service Award, 2014, 2015
 - ◇ Member of the Pioneer in Robotics and Automation Award Nomination Committee, 2014, 2015
 - ◇ Co-chair of the Pioneer in Robotics and Automation Award Nomination Committee, 2013
 - ◇ Member of the Financial Activities Board (FAB), 2008-2013
 - ◇ Member of the Technical Activities Board (TAB), 2008-2013
 - ◇ Member of the Steering Committee for Technical Programs (SCTP), 2006-2009
 - ◇ Associate Vice President for Publications, 2005-2006
 - ◇ Member of the Conference Board and the Member Services Committee, 2005-2007
 - ◇ Member of the ad hoc committee to rename and redefine the scope of the *IEEE Transactions on Robotics and Automation*, 2002
 - ◇ Co-chair, Technical Committee on Computer and Robot Vision, 1992-1996
- **IEEE Boards and Committees**
 - ◇ IEEE Periodicals Review and Advisory Committee (PRAC), 2016-2018
 - ◇ Division 10 representative to the IEEE Thesaurus Editorial Board, 2014-2018
- **Conference and Workshop Organization**
 - ◇ Steering Committee, *Workshop on the Algorithmic Foundations of Robotics (WAFR)*, 2009-present
 - ◇ Program Co-Chair for the Americas, *IEEE Int'l Conf. on Robotics and Automation (ICRA)*, 2016
 - ◇ Area Chair, *Robotics: Science and Systems (RSS)*, 2012, 2013, 2017
 - ◇ Program Co-chair, *IEEE Int'l Conf. on Intelligent Robots and Systems (IROS)*, 2015, 2017
 - ◇ Program Co-chair for the Americas, *IEEE Int'l Conf. on Intelligent Robots and Systems (IROS)*, 2008, 2014
 - ◇ Program Co-chair for America, *13th International Conference on Advanced Robotics*, 2007
 - ◇ Co-chair, *Workshop on the Algorithmic Foundations of Robotics*, 2002
 - ◇ Program Vice-chair, *9TH IEEE International Conference on Tools with Artificial Intelligence (IC-TAI97)*, November 1997
 - ◇ Co-chair, IEEE Workshop on Visual Servoing: Achievements, Applications and Open Problems, San Diego, May 1994
- **Program Committees**
 - ◇ IEEE Conference on Control Technology and Applications, 2017
 - ◇ Workshop on the Algorithmic Foundations of Robotics (WAFR): 1994, 2002, 2006, 2008, 2010, 2014, 2016
 - ◇ IEEE Conf. on Decision and Control (CDC): 2012
 - ◇ IEEE Int'l Conf. on Intelligent Robots and Systems (IROS): 1992, 1994, 1996, 1998, 2001-2006, 2008-2011

- ◇ IEEE Int'l Conf. on Robotics and Automation (ICRA): 1994, 1996, 1997 1999-2003, 2005-2006, 2017 (Senior Program Committee)
- ◇ American Control Conference (ACC): 2011
- ◇ Robotics: Science and Systems (RSS): 2005, 2009, 2014
- ◇ Robotics Challenges and Vision Workshop (held in conjunction with RSS): 2013
- ◇ Int'l Conf. on Pattern Recognition (ICPR): 2002, 2010, 2012
- ◇ IEEE Workshop on Visual Control of Mobile Robots (ViCoMoR): 2011, 2012
- ◇ International Conference on Informatics in Control, Automation and Robotics (ICINCO): 2007
- ◇ International Conference on Control, Automation and Systems (ICCAS): 2007
- ◇ IASTED International Conference on Robotics and Applications: 2007
- ◇ 13th International Conference on Advanced Robotics: 2007
- ◇ SICE-ICASE International Joint Conference: 2006
- ◇ SPIE Conf. on Optomechatronic Systems Control: 2006
- ◇ Int'l Conf. on Computer Vision Theory and Applications (VISAPP): 2006
- ◇ IEEE Int'l Conf. on Multisensor Fusion and Integration for Intelligent Systems (MFI): 1994, 1996, 1999, 2001, 2003, 2006, 2008, 2009
- ◇ IEEE Int'l Conf. on Comp. Vision and Pattern Recognition (CVPR): 1996, 1997, 2000, 2001
- ◇ IEEE Int'l Conf. on Industrial Electronics, Technology & Automation (IETA): 2001
- ◇ Thirty-First International Symposium on Robotics (ISR): 2000
- ◇ SPIE Conf. on Sensor Fusion and Decentralized Control in Autonomous Robotic Sys.: 1997, 1999
- ◇ IEEE Workshop on Perceptual Organization in Computer Vision (held with CVPR): 1998
- ◇ Nat'l Conf. on Artificial Intelligence (AAAI): 1994, 1996
- ◇ Sixth Int'l Symposium on Robotics and Manufacturing (ISRAM): 1996
- ◇ IROS Workshop on Vision for Robots: 1995
- ◇ SPIE Conf. on Neural and Stochastic Methods in Image and Signal Processing: 1992, 1993, 1994
- ◇ The Twelfth Int'l Conf. on Pattern Recognition — Comp. Vision and Applications: 1994
- ◇ SPIE Conf. on Applications of Artificial Intelligence XI: Machine Vision and Robotics: 1993
- ◇ SPIE Conf. on Stochastic Methods in Signal Proc., Image Proc., and Comp. Vision: 1991
- **Reviewer**
 - ◇ **National Science Foundation** Spring 1994, Fall 1995, Spring 1997, Spring 2002, Winter 2008, Fall 2012, Spring 2014, Spring 2015
 - ◇ **National Institute of Justice**, Standing Scientific Review Panel on Technology, 2013
 - ◇ **NASA**: Spring 1999, Winter 2005, Winter 2006, Fall 2007
 - ◇ **INRIA**: evaluation of the *control and complex systems* program, Fall 2004
 - ◇ **EU Framework Programme for research and technology development**:
 - Evaluation Panel for Information and Communication Technologies (ICT-2009.2.1 Cognitive Systems and Robotics), 2009, 2010, 2011, 2012, 2013, 2014
 - Site Review Committee: 2012 (TOMSY), 2013 (TOMSY), 2014 (TOMSY, PACMAN), 2015 (PACMAN)
 - ◇ **Ben Dasher Award Selection Committee**, Frontiers in Education Conference, 1993
 - ◇ **Journals**: IEEE Trans. on Robotics and Automation, Robotics and Autonomous Systems, International Journal of Robotics Research, IEEE Trans. on Image Processing, IEEE Trans. on Pattern Analysis and Machine Intelligence, IEEE Trans. on Computers, IEEE Trans. on Systems, Man, and Cybernetics, IEEE Computer Magazine, IEEE Control Magazine, Journal of Robotic Systems, ASME Trans. Journal of Engineering for Industry, Computer Vision, Graphics, and Image Processing: Image Understanding, Robotics and Computer-Integrated Manufacturing
 - ◇ **Conferences and Workshops**: dozens of technical conferences and workshops
- **Professional Memberships**: IEEE (Fellow), Robotics Society of India, 2013-present.

INVITED LECTURES, SEMINARS, AND COLLOQUIA

- University of Texas at Dallas (Mar. 2017)
- Robotics Big Bang for Humanity Workshop, Tohoku University, Sendai, Japan (Jan. 2017)
- Istituto Italiano di Tecnologia (IIT), Genoa (Dec. 2016)
- IEEE/RSJ IEEE Int'l Conf. on Intelligent Robots and Systems (*Keynote*, Oct. 2016)
- The 19th International Conference on Climbing and Walking Robots (*Keynote*, Sep. 2016)
- ARL Workshop on Heterogeneity, Diversity and Resilience in Multi-Robot Systems (Aug. 2016)
- IEEE Int'l. Conf. on Robotics and Automation (*Keynote*, May 2016)
- MIT (Apr. 2016)
- Université de Rennes, France (Dec., 2015)
- University of Washington (Dec. 2015)
- Georgia Institute of Technology (Nov. 2015)
- NSF National Robotics Initiative PI meeting (*Keynote*, Nov. 2015)
- Pontificia Universidad Católica de Chile, Santiago, Chile (Nov. 2014)
- Universidad Técnica Federico Santa Maria, Valparaiso, Chile (Nov. 2014)
- Aviation Innovation Conference: Spanning Manned and Unmanned Aviation, U. Illinois (*Plenary*, Nov. 2014)
- Advances in Robotics, Pune, India (*Plenary*, July 2013)
- International Workshop on Recent Developments in Robotics and Control, U. Texas at Dallas (Nov. 2012)
- Georgia Institute of Technology (Nov. 2011)
- Tecnológico de Monterrey, Campus Guadalajara (Oct. 2011)
- Università degli Studi di Pisa, Italy (July, 2011)
- University of Birmingham, England (June 2011)
- Boston University (Feb. 2011)
- 3do Taller en Robótica y Planificación de Movimientos, Guanajuato, Mexico (Nov. 2010)
- Maryland Robotics Center, University of Maryland (Oct. 2010)
- Festschrift for Dick Volz, Texas A&M (Apr. 2010)
- Workshop on Search and Pursuit/Evasion in the Physical World: Efficiency, Scalability, and Guarantees (held with ICRA 2010, May 2010)
- LAAS, Toulouse, France (Sep. 2009)
- FIRA, Incheon, South Korea (*Plenary*, Aug. 2009)
- Centro de Investigación en Matemáticas, Guanajuato, Mexico (Aug. 2009)
- Technical University of Munich, Germany (March 2009)
- Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, CINVESTAV, Saltillo, Mexico, (Feb. 2009)
- Int'l. Congress of Mechatronics, Sinergia, Guadalajara, Mexico (*Plenary*, Oct. 2008)
- University of Tennessee (September 2008)
- l'Institut Français de Mécanique Avancée, Clermont-Ferrand, France (June 2008)
- 2do Taller en Robótica y Planificación de Movimientos, Guanajuato, Mexico (Feb. 2008)
- University of Southern California (Nov. 2007)
- Mexican Int'l. Conf. on Artificial Intelligence, Aguascalientes, Mexico (*Plenary*, Nov. 2007)
- GRASP Lab, University of Pennsylvania (May 2007)
- Colloquium on Robotics and Automation, Università Degli Studi di Napoli Federico II, Naples Italy (Dec. 2006)
- LAAS, Toulouse, France (June 2006)
- Dagstuhl Seminar on Form and Content in Sensor Networks, Wadern, Germany (Sep. 2005)
- Tecnológico de Monterrey, Campus Estado de México (June 2005)
- University of Florida (April, 2005)
- The Australian National University (January, 2005)
- Johns Hopkins University (April, 2003)

- Carnegie Mellon University (April, 2002)
- University of Louisville (May, 2001)
- Dagstuhl Seminar on Modelling of Sensor-Based Intel. Robot Sys., Wadern, Germany (Oct. 2000)
- Simon Fraser University, Vancouver, Canada (Sept. 2000)
- Joint EU-US Workshop on Key Research Issues and Opportunities in Motion Planning (July 2000)
- Technical University of Vienna, Austria (November 1999)
- Technical University of Munich, Germany (November 1999)
- Iowa State University (November 1998)
- IRISA/INRIA, Rennes, France (June 1998)
- Technical University of Munich, Germany (June 1998)
- LAAS, Toulouse, France (May 1998)
- Blaise Pascal University, France (June 1996)
- University of Texas at Austin (June 1995)
- Oak Ridge National Laboratory (Jan. 1995)
- Texas A & M University (May 1994)
- Michigan State University — Pattern Recognition and Image Processing Laboratory (Nov. 1993)
- Michigan State University — Dept. of Computer Science (Nov. 1993)
- Carnegie Mellon University — Robotics Institute (Oct. 1993)
- Carnegie Mellon University — Vision and Autonomous Systems Center (Oct. 1993)
- Rensselaer Polytechnic Institute (March 1993)
- Illinois State University (March 1992)
- University of Chicago (Jan. 1992)
- University of Notre Dame (Jan. 1992)
- University of South Florida (April 1991)
- Illinois Institute of Technology (April 1991)

AWARDS AND HONORARIES

- Finalist (one of four), Best Interactive Paper Award, *Proc. IEEE-RAS Int'l. Conf. on Humanoid Robots*, 2015, L. Lanari, S. Hutchinson, “Planning Desired Center of Mass and Zero Moment Point Trajectories for Bipedal Locomotion.”
- Recipient of the Academic Leaders Program’s visiting professorship, Tecnológico de Monterrey, Campus of Guadalajara (2011)
- The Romulo Garza Award (third place in Science and Technology) from the Tec de Monterrey (2011), for the paper “Planning Exploration Strategies for Simultaneous Localization and Mapping,” by B. Tovar, L. Munoz-Gomez, R. Murrieta-Cid, M. Alencastre-Miranda, R. Monroy, and S. Hutchinson, *Robotics and Autonomous Systems*, Elsevier, Vol. 54, No. 4, April 2006, pp. 314-331.
- Finalist (one of five), Best Student Paper Award (Stephen Kloder), *IEEE Int'l. Conf. on Robotics and Automation*, 2008, S. Kloder and S. Hutchinson, “Partial Barrier Coverage: Using Game Theory to Optimize Probability of Undetected Intrusion in Polygonal Environments.”
- Finalist, (one of six) Best Student Paper Award (Sourabh Battacharya), *Robotics: Science and Systems IV*, 2008, S. Bhattacharya and S. Hutchinson, “Approximation Schemes for Two-Player Pursuit Evasion Games with Visibility Constraints.”
- Best Paper Award, *Fourth Mexican Int'l Conf. on Artificial Intelligence*, R. Murrieta-Cid, A. Sarmiento, T. Muppirala, S. Hutchinson, R. Monroy, M. Alencastre-Miranda, L. Munoz-Gomez and R. Swain, “A Framework for Reactive Motion and Sensing Planning: A Critical Events-based Approach,” in *Advances in Artificial Intelligence — MICAI*, A. Gelbukh, A. Albornoz, H. Terashima-Marn Eds., Springer-Verlag LCNS 3789, 2005, pp. 990-1000.
- José Negrete Best Paper Award, *IX Ibero-American Conference on Artificial Intelligence (IBERAMIA)*, A. Sarmiento, R. Murrieta-Cid and S. Hutchinson, “A Multi-robot Strategy for Rapidly Searching a Polygonal Environment,” in *Advances in Artificial Intelligence – IBERAMIA*, C. Lemaître, C. A.

Reyes, J. A. González Eds., Springer-Verlag, Heidelberg, LCNS 3315, 2004, pp. 484-493.

- Finalist (one of five) for the 1998 King-Sun Fu Memorial Best Transactions Paper Award, S. LaValle and S. Hutchinson, “Multiple-Robot Motion Planning Under Independent Objectives,” *IEEE Trans. on Robotics and Automation*, Vol. 14, No. 6, Dec. 1998, pp. 912-925.
- Finalist (one of five) for the 1996 King-Sun Fu Memorial Best Transactions Paper Award, S. Hutchinson, G. Hager, and P. Corke, “A Tutorial on Visual Servo Control,” *IEEE Trans. on Robotics and Automation*, Vol. 12, No. 5, Oct. 1996, pp. 651-670.
- Distinguished Student Paper Award (Steve LaValle), *Ninth Conference on Uncertainty in Artificial Intelligence*, 1993, S. LaValle and S. Hutchinson, “On Considering Uncertainty and Alternatives in Low-Level Vision.”
- Fellow of the IEEE, 2007
- Arnold O. Beckman Research Award, 1994
- NSF Research Initiation Award, 1991
- Magoon Teaching Award, 1985
- Eta Kappa Nu

THESIS SUPERVISION

Ph.D. Thesis Supervision

- 1 Hyongju Park, *Fault-Tolerant Control Policies for Multi-robot Systems*, Ph.D., Jul. 2016
- 2 Junho Yang, *Vision-Based Estimation, Localization, and Mapping for Autonomous Vehicles*, Ph.D., Dec. 2015 (jointly supervised with Prof. Soon-Jo Chung).
- 3 Han Ul Yoon, *Assistive HRI Interface with Perceptual Feedback Control: An Approach to Customizing Assistance Based on User Dexterity*, Ph.D., Aug. 2014.
- 4 James Davidson, *Exploiting Insensitivity in Stochastic Systems to Learn Approximately Optimal Policies*, Ph.D., Aug. 2012.
- 5 Salvatore Candido, *Optimization of Stochastic, Partially Observed Systems using Switched Policies and a Sampling-based Approach*, Ph.D., Aug. 2011.
- 6 Sourabh Bhattacharya, *Pursuit-Evasion Games in Mobile Networks*, Ph.D., May. 2010.
- 7 Stephen Kloder, *Barrier Coverage: Deploying Robot Guards to Prevent Intrusion*, Ph.D., Dec. 2008.
- 8 Nicholas Gans, *Hybrid Switched System Visual Servo Control*, Ph.D., Dec. 2005.
- 9 Alejandro Sarmiento, *Generating Expected-Time Efficient Trajectories for Rapidly Finding an Object in Known Environments*, Ph.D., Dec. 2004.
- 10 Peter Leven, *A Framework for Real-Time Path Planning in Changing Environments*, Ph.D., May 2001.
- 11 Kevin Nickels, *Model Based Tracking of Articulated Objects*, Ph.D., Aug. 1998.
- 12 Rebecca Castano, *Yield Estimation for Multichip Module Ceramic Substrates*, Ph.D., Dec. 1997.
- 13 Herry Sutanto, *Robot Motion Planning with Visual Constraints*, Ph.D., May 1997 (jointly supervised with Dr. Rajeev Sharma).
- 14 Michael Barbehenn, *Toward Incremental Geometric Robot Motion Planning*, Ph.D., Dec. 1995.
- 15 Steven LaValle, *A Game-Theoretic Framework for Robot Motion Planning*, Ph.D., Aug. 1995.

M.S. Thesis Supervision

- 16 Jifei Xu, *Biped Walking Trajectory Design and Stabilization*, M.S.E.C.E., May 2017.
- 17 Jon Hoff, *Optimizing the Structure and Movement of a Robotic Bat with Biological Kinematic Synergies*, M.S.M.S.E., May. 2017.
- 18 Mingyo Seo, *Application of a Model-Based Nonlinear Attitude Control for Quadrotor UAVs*, M.S.M.E., Aug. 2016.

- 19 Maria de Lourdes Labastida Valdes *Uso de la Medida de Perceptibilidad de Movimiento para Guiar Visualmente a un Vehículo Submarino*, M.S., Cinvestav, Saltillo, Mexico, (co-advisor) Dec., 2015.
- 20 Alexander von Alt, *From Interest Points to Map Transformation: A Discussion of RGB-D SLAM and Its Applications*, M.S.E.C.E., May 2013.
- 21 Dushyant Rao, *CurveSLAM: Utilizing Higher Level Structure in Stereo Vision-based Navigation*, M.S.A.E., Aug., 2012 (jointly supervised with Prof. Soon-Jo Chung).
- 22 Devin Bonnie, *Probabilistic Search: A bayesian Approach in a Continuous Workspace*, M.S.E.C.E., Dec. 2011.
- 23 Wenzhuo Ma, *Visual Servoing for Avoiding Environment Constraints*, M.S.E.C.E., May 2009.
- 24 Salvatore Candido, *Motion Planning for Bipedal Walking Robots*, M.S.E.E., May 2007.
- 25 James Davidson, *Hyperfiltering for Stochastic systems*, M.S.E.E., May 2007.
- 26 Sourabh Bhattacharya, *Optimal Paths for Landmark-Based Navigation by Nonholonomic Vehicles with Field-of-View Constraints*, M.S.E.E., May 2005.
- 27 Stephen Kloder, *Permutation-Invariant Multi-Robot Formations: A Complex Polynomial-Based Foundation*, M.S.C.S., Dec. 2004.
- 28 Bradley Chambers, *Point- and Window-Based Matching in Images Using Critical Point Filters*, M.S.E.E., May 2004.
- 29 Jerome Durand, *Real-Time Object Tracking Using Multiresolution Critical Points Filters*, M.S.E.E., Dec. 2002.
- 30 Nicholas Gans, *Performance Tests of Partitioned Approaches to Visual Servo Control*, M.S.E.E., May 2002.
- 31 Peter Kim, *Interactive Image Segmentation Using Level Set Methods in a Virtual Reality Environment*, M.S.C.S., Aug. 2000.
- 32 Youngmin Kim, *Projective Geometry and Visual Servoing*, M.S.E.E., Dec. 1997.
- 33 Eric Gree, *Using Corresponding Points for Object Modeling*, M.S.E.E., Dec. 1996.
- 34 Peter Leven, *A Multithreaded Implementation of a Robot Control C Library*, M.S.E.E., Dec. 1996.
- 35 Salvatore M. Mazzola, *Design and Control of an Underactuated Robot*, M.S.E.E., Dec. 1995.
- 36 Kevin Nickels, *Textured Image Segmentation Using Markov Random Fields: Returning Multiple Solutions*, M.S.E.E., Dec. 1995.
- 37 Ken Moroney, *Implementation and Analysis of Lowe's Model-Based Motion Tracking System*, M.S.E.E., May 1995.
- 38 Fredrick Geiger, *Hybrid Force/Vision Control of Robotic Manipulators*, M.S.E.E., December 1994.
- 39 Rebecca Castaño, *A Probabilistic Framework for Grouping Image Features*, M.S.E.E., August 1994.
- 40 James Reed, *Subpixel Parameter Estimation for Circular Shapes Using Image Sequences*, M.S.E.E., May 1994.
- 41 Michael Barbehenn, *Efficient Search and Hierarchical Motion Planning by Dynamically Maintaining Single-Source Shortest Paths Trees*, M.S.C.S., February, 1993.
- 42 Steven M. LaValle, *A Bayesian Framework for Considering Probability Distributions of Image Segments and Segmentations*, M.S.E.E., December, 1992.
- 43 Sandeep Pandya, *A Case-Based Approach to Robot Motion Planning*, M.S.C.S., August 1992.
- 44 Andrés Castaño, *Hybrid Vision/Position Servo Control of a Robotic Manipulator*, M.S.E.E., August, 1992.
- 45 Armando Fox, *Exploiting Visual Geometric Constraints in Robot Motion Planning with Uncertainty*, M.S.E.E., May 1992.

46 Robert Spence, *Avoiding Unexpected Moving Obstacles by Integrating Potential Field Planning and Real-Time Control*, M.S.E.E., May 1992.

External Examination Committees

- ◇ Caixia Cai, *Ph.D.*, Technical University of Munich (May, 2017)
- ◇ Liu Zhichao, *Ph.D.*, Nanyang Technological University (Dec., 2015)
- ◇ Riccardo Spica, *Ph.D.*, Université de Rennes, France (Dec., 2015)
- ◇ Olivier Roussel, *Ph.D.*, l'Université Paul Sabatier, Toulouse, France (Oct., 2015)
- ◇ Akbar Assa, *Ph.D.*, Ryerson University, Toronto, Canada October, 2014.
- ◇ Rob Reilink, *Ph.D.*, University of Twente, The Netherlands April, 2013.
- ◇ Alexandre Krupa, *Habilitation à diriger des recherches*, Université de Rennes, France (Nov., 2012)
- ◇ Azad Shademan, *Ph.D.*, University of Alberta, Edmonton, Alberta, Canada (Aug., 2012)
- ◇ Viviane Cadenat, *Habilitation à diriger des recherches*, l'Université Paul Sabatier, Toulouse, France (Dec., 2011)
- ◇ Felipe Augusto Weilemann Belo, *Ph.D.*, Università degli Studi di Pisa, July, 2011.
- ◇ Paolo Salaris, *Ph.D.*, Università degli Studi di Pisa, July, 2011.
- ◇ Michel Taix, *Habilitation à diriger des recherches*, l'Université Paul Sabatier, Toulouse, France (Feb., 2011)
- ◇ Mohamed Marey, *Ph.D.*, Université de Rennes, France (Dec., 2010)
- ◇ Youcef Mezouar, *Habilitation à diriger des recherches*, l'Université Blaise Pascal de Clermont-Ferrand, France (Nov., 2009)
- ◇ Alireza Nakhaei, *Ph.D.*, l'Institut National Polytechnique de Toulouse, France (Sep., 2009)
- ◇ Romeo Tatsambon, *Ph.D.*, Université de Rennes, France (Nov., 2008)
- ◇ Christophe Collewet, *Habilitation à diriger des recherches*, Université de Rennes, France (Sep. 2008)
- ◇ Guoqiang Hu, *Ph.D.*, University of Florida (Nov., 2007)
- ◇ David Folio, *Ph.D.*, l'Institut National Polytechnique de Toulouse, France (Jul., 2007)
- ◇ Eric Royer, *Ph.D.*, l'Université Blaise Pascal de Clermont-Ferrand (Sep., 2006)
- ◇ Eric Marchand, *Habilitation à diriger des recherches*, Université de Rennes, France (Nov. 2004)
- ◇ Omar Tahri, *Ph.D.*, Université de Rennes, France (Mar., 2004)
- ◇ Yong Yu, *Ph.D.*, Simon Fraser University, Vancouver, Canada (Sept. 2000)
- ◇ Zachary Dodds, *Ph.D.*, Yale University, New Haven, Connecticut (Jan., 2000)
- ◇ Stéphanie Jonquière, *Ph.D.*, l'Institut National Polytechnique de Toulouse, France (Jan., 2000)
- ◇ Alexa Hauck, *Ph.D.*, Technical University of Munich, Germany (Nov., 1999)
- ◇ Hilmi Rifai, *Ph.D.*, Ecole Nationale Supérieure des Télécommunications, Paris, France (Nov., 1999)
- ◇ Ricardo Swain Oropeza, *Ph.D.*, l'Institut National Polytechnique de Toulouse, France (Jun., 1999)

MEDIA COVERAGE

- Domestic print and electronic popular media: NBC News, ABC News, CBS News, Fox News, The New York Times, The Wall Street Journal, The Associated Press, Market Watch, Business Insider, Voice of America, NPR, The News Hour (PBS), Yahoo News, The Christian Science Monitor
- International print and electronic popular media: The Daily Mail, The Daily Telegraph, The BBC, International Business Times, Frankfurter Allgemeine, Deutsche Wirtschafts Nachrichten, ABC Espanol, Le Scienze, Numerama, NRC Media
- Tech media: IEEE Spectrum, Smithsonian Air and Space Magazine, The Scientist, CNET, Popular Science, Popular Mechanics, Cosmos Magazine, Science News, Robotics Trends, Mashable, Hackaday, Tech Crunch, SlashGear, Boing Boing, Engadget, Digital Trends, Futura Sciences
- Appearances, television and radio: Daily Planet (Discovery Channel Canada), Danish Broadcasting Corp., National Swedish Radio

PUBLICATIONS

Books

- 1 M. Spong, S. Hutchinson, M. Vidyasagar, *Robot Modeling and Control*, John Wiley and Sons, New York, 2006.
- 2 H. Choset, K. M. Lynch, S. Hutchinson, G. Kantor, W. Burgard, L. E. Kavraki and S. Thrun, *Principles of Robot Motion: Theory, Algorithms, and Implementations*, MIT Press, Boston, 2005.
- 3 J.-D. Boissonnat, J. Burdick, K. Goldberg and S. Hutchinson, eds., *Algorithmic Foundations of Robotics V*, Springer-Verlag, Heidelberg, Germany, 2003.

Articles

- 4 H. Park, S. A. Hutchinson, “Fault-tolerant Rendezvous of Multi-robot Systems,” *IEEE Trans. on Robotics*, to appear.
- 5 A. Ramezani, S.-J. Chung, S. A. Hutchinson, “A biomimetic robotic platform to study flight specializations of bats,” *Science Robotics* (Cover Article), February 2017, Volume 2, Issue 3, [also featured in *Nature* 542,140 (09 February 2017) doi:10.1038/542140a].
- 6 H. U. Yoon, R. F. Wang, , S. A. Hutchinson, P. Hur, “Customizing Haptic and Visual Feedback for Assistive Human-Robot Interface and the Effects on Performance Improvement,” *Robotics and Autonomous Systems*, in press (available online Feb. 3, 2017).
- 7 I. Becerra, R. Murrieta-Cid, R. Monroy, S. Hutchinson, J-P. Laumond, “Maintaining Strong Mutual Visibility of an Evader Moving over the Reduced Visibility Graph” *Autonomous Robots*, February 2016, Volume 40, Issue 2, pp 395-423.
- 8 G. Panahandeh, S. Hutchinson, P. Handel, M. Jansson, “Visual Inertial Navigation Using Horizontal Plane Features: Observability Analysis and Motion Estimation,” *Journal of Intelligent and Robotic Systems*, May 2016, Volume 82, Issue 2, pp 277-299.
- 9 J. Yang, A. Dani, S.-J. Chung, S. Hutchinson, “Vision-Based Localization and Robot-Centric Mapping in Riverine Environments,” *Journal of Field Robotics*, (available online Sep. 23, 2015).
- 10 A. Paranjape, K. Meier, X. Shi, S.-J. Chung, and S. Hutchinson, “Motion Primitives and 3-D Path Planning for Fast Flight through a Forest,” *Int’l Journal of Robotics Research*, Volume 34, Number 3, March 2015, pp. 357-377.
- 11 A. Dani, S.-J. Chung, S. Hutchinson, “Observer Design for Stochastic Nonlinear Systems via Contraction-Based Incremental Stability,” *IEEE Trans. on Automatic Control*, Volume 60, Number 3, 2015, pp. 700-714.
- 12 J. Espinoza, A. Sarmiento, R. Murrieta-Cid, S. Hutchinson, “Motion Planning Strategy for Finding an Object with a Mobile Manipulator in Three-Dimensional Environments,” *Advanced Robotics*, Volume 25, Numbers 13-14, 2011, pp. 1627-1650.
- 13 R. Murrieta-Cid, U. Ruiz, J. Marroquin, J.-P. Laumond, S. Hutchinson, “Tracking an Omnidirectional Evader with a Differential Drive Robot,” *Autonomous Robots*, Volume 31, Number 4, 2011, Pages 345-366.
- 14 S. Bhattacharya and S. Hutchinson, “A Cell Decomposition Approach to Visibility-Based Pursuit Evasion among Obstacles,” *Int’l Journal of Robotics Research*, Volume 30, Issue 14, 2011, pp. 1709-1727.
- 15 G. Lopez-Nicolas, N. Gans, S. Bhattacharya, C. Sagues, J. J. Guerrero, S. Hutchinson, “Homography-Based Control Scheme for Mobile Robots With Nonholonomic and Field-of-View Constraints,” *IEEE Trans. on Systems, Man, and Cybernetics, Part B: Cybernetics*, Volume: 40 , Issue: 4, 2010, Page(s):

1115 - 1127.

- 16 S. Bhattacharya and S. Hutchinson, "On the Existence of Nash Equilibrium for a Two Player Pursuit-Evasion Game with Visibility Constraints," *Int'l Journal of Robotics Research*, Volume 29, Number 7, 2010, pp. 831-839.
- 17 A. Sarmiento, R. Murrieta-Cid, S. Hutchinson, "An Efficient Motion Strategy to Compute Expected-Time Locally Optimal Continuous Search Paths in Known Environments," *Advanced Robotics*, Volume 23, Numbers 12-13, 2009, pp. 1533-1560.
- 18 N. Gans and S. Hutchinson, "Multi-Attribute Utility Analysis in the Choice of a Vision-Based Robot Controller," *The International Journal of Optomechatronics*, Volume 2, Number 3, 2008, pp. 326-360.
- 19 F. Chaumette and S. Hutchinson, "Visual Servo Control, Part II: Advanced Approaches," *IEEE Robotics and Automation Magazine*, Volume 14, Issue 1, March 2007 pp. 109 - 118.
- 20 N. Gans and S. Hutchinson, "Stable Visual Servoing through Hybrid Switched-System Control," *IEEE Trans. on Robotics*, Vol. 23, No. 3, June, 2007, pp. 530-540.
- 21 R. Murrieta-Cid, T. Muppirala, A. Sarmiento, S. Bhattacharya, and S. Hutchinson, "Surveillance Strategies for a Pursuer with Finite Sensor Range," *Int'l Journal of Robotics Research*, Vol. 26, No. 3, 2007, pp. 233-253.
- 22 S. Bhattacharya, R. Murrieta-Cid, and S. Hutchinson, "Optimal Paths for Landmark-based Navigation by Differential Drive Vehicles with Field-of-View Constraints," *IEEE Trans. on Robotics*, Vol. 23, No. 1, Feb., 2007, pp. 47-59.
- 23 B. Tovar, L. Munoz-Gomez, R. Murrieta-Cid, M. Alencastre-Miranda, R. Monroy and S. Hutchinson, "Planning Exploration Strategies for Simultaneous Localization and Mapping," *Journal of Robotics and Autonomous Systems*, Vol. 54, No. 4, Apr., 2006, pp. 314-331.
- 24 F. Chaumette and S. Hutchinson, "Visual Servo Control, Part I: Basic Approaches," *IEEE Robotics and Automation Magazine*, Vol. 13, No. 4, Dec., 2006, pp. 82-90.
- 25 S. Kloder and S. Hutchinson, "Path Planning for Permutation-Invariant MultiRobot Formations," *IEEE Trans. on Robotics*, Vol. 22, No. 4, 2006, pp. 650-665.
- 26 R. Murrieta, B. Tovar and S. Hutchinson, "A Sampling-Based Motion Planning Approach to Maintain Visibility of Unpredictable Targets," *Autonomous Robots*, Vol. 19, No. 3, 2005, pp. 285-300.
- 27 N. Gans, S. Hutchinson and P. Corke, "Performance Tests for Visual Servo Control Systems, with Application to Partitioned Approaches to Visual Servo Control," *Int'l Journal of Robotics Research*, Vol. 22, No. 10-11, Oct.-Nov. 2003, pp. 955-981.
- 28 P. Leven and S. Hutchinson, "Using Manipulability to Bias Sampling During the Construction of Probabilistic Roadmaps," *IEEE Trans. on Robotics and Automation*, Vol. 19, No. 6, Dec. 2003, pp. 1020-1026.
- 29 P. Leven and S. Hutchinson, "Realtime Path Planning in Changing Environments," *Int'l Journal of Robotics Research*, vol. 21, No. 12, Dec. 2002, pp. 999-1030.
- 30 P. Ranganathan, J.B. Hayet, M. Devy, S. Hutchinson and F. Lerasle, "Topological Navigation and Qualitative Localization for Indoor Environment Using Multisensory Perception," *Robotics and Autonomous Systems*, Vol. 41, Nos. 2-3, Nov. 2002, pp. 137-144.
- 31 K. Nickels and S. Hutchinson, "Estimating Uncertainty in SSD-Based Feature Tracking," *Image and Vision Computing*, vol. 20, no. ER1, 2002 pp. 47-58
- 32 P. I. Corke and S. A. Hutchinson, "A New Partitioned Approach to Image-Based Visual Servo Control,"

- IEEE Trans. on Robotics and Automation*, Vol. 17, No. 4, Aug. 2001, pp. 507-515.
- 33 K. Nickels and S. Hutchinson, "Model-Based Tracking of Complex Articulated Objects," *IEEE Trans. on Robotics and Automation*, Vol. 17, No. 1, Feb. 2001, pp. 28-36.
 - 34 H. Rifai, I. Bloch, S. Hutchinson, J. Wiart and L. Garnero, "Segmentation of the Skull Using Deformable Model and Taking Partial Volume Effect into Account," *Medical Image Analysis*, Vol. 4, Iss. 3, Sept. 2000, pp. 219-233.
 - 35 H. Rifai, I. Bloch, S. Hutchinson, J. Wiart and L. Garnero, "Segmentation par modèle déformable des régions osseuses de la tête dans les volume IRM," *Traitement du Signal*, Vol. 16, No. 4, 1999, pp. 319-330.
 - 36 S. LaValle and S. A. Hutchinson, "Optimal Motion Planning for Multiple Robots Having Independent Goals," *IEEE Trans. on Robotics and Automation*, Vol. 14, No. 6, Dec. 1998, pp. 912-925.
 - 37 S. LaValle and S. A. Hutchinson, "An Objective-Based Framework for Motion Planning Under Sensing and Control Uncertainties," *Int'l Journal of Robotics Research*, Vol. 17, No. 1, Jan. 1998, pp. 19-42.
 - 38 S. LaValle, K. Moroney and S. A. Hutchinson, "Methods for Numerical Integration of High-Dimensional Posterior Densities with Application to Statistical Image Models," *IEEE Trans. on Image Processing*, Vol. 6, No. 12, Dec. 1997, pp. 1659-1672.
 - 39 K. Nickels and S. Hutchinson, "Textured Image Segmentation: Returning Multiple Solutions," *Image and Vision Computing*, Vol. 15, 1997, pp. 781-795.
 - 40 R. Sharma and S. Hutchinson, "Motion Perceptibility and Its Application to Active Vision-Based Servo Control," *IEEE Trans. on Robotics and Automation*, Vol. 13, No. 4, 1997, pp. 607-617.
 - 41 R. L. Castaño and S. A. Hutchinson, "A Probabilistic Approach to Perceptual Grouping," *Computer Vision and Image Understanding*, Vol.64, No. 3, Nov. 1996, pp. 399-419.
 - 42 B. Bishop, S. A. Hutchinson and M. W. Spong, "Camera Modelling for Visual Servo Control Applications," *Mathematical and Computer Modelling*, Special issue on Modelling Issues in Visual Sensing, Vol. 24, No. 5/6, 1996, pp. 79-102.
 - 43 S. Hutchinson, G. Hager and P. Corke, "A Tutorial on Visual Servo Control," *IEEE Trans. on Robotics and Automation*, Vol. 12, No. 5, Oct. 1996, pp. 651-670.
 - 44 J. Reed and S. Hutchinson, "Image Fusion and Subpixel Parameter Estimation for Automated Optical Inspection of Electronic Components," *IEEE Trans. on Industrial Electronics*, Vol. 43, No. 3, June 1996, pp. 346-354.
 - 45 R. Sharma, S. LaValle and S. A. Hutchinson, "Optimizing Robot Motion Strategies for Assembly with Stochastic Models of the Assembly Process," *IEEE Trans. on Robotics and Automation*, Vol. 12, No. 2, Apr. 1996, pp. 160-174.
 - 46 M. Barbehenn and S. Hutchinson, "Efficient Search and Hierarchical Motion Planning By Dynamically Maintaining Single-Source Shortest Paths Trees," *IEEE Trans. on Robotics and Automation*, Vol. 11, No. 2, Apr. 1995, pp. 198-214.
 - 47 S. LaValle and S. A. Hutchinson, "A Bayesian Framework for Constructing Probability Distributions on the Space of Image Segmentations," *Computer Vision and Image Understanding*, Vol. 61, No. 2, March 1995, pp. 203-230.
 - 48 A. Fox and S. A. Hutchinson, "Exploiting Visual Constraints in the Synthesis of Uncertainty-Tolerant Motion Plans," *IEEE Trans. on Robotics and Automation*, Vol. 11, No. 1, Feb. 1995, pp. 56-71.
 - 49 S. LaValle and S. A. Hutchinson, " A Bayesian segmentation methodology for parametric image

models,” *IEEE Trans. on Pattern Analysis and Machine Intelligence*, Vol. 17, No. 2, Feb. 1995, pp. 211-217.

- 50 R. Spence and S. Hutchinson, “An Integrated Architecture for Robot Motion Planning and Control in the Presence of Obstacles with Unknown Trajectories,” *IEEE Trans. on Systems, Man, and Cybernetics*, Vol. 25, No. 1, Jan. 1995, pp. 100-110.
- 51 A. Castano and S. A. Hutchinson, “Visual Compliance: Task-Directed Visual Servo Control,” *IEEE Trans. on Robotics and Automation*, Vol. 10, No. 3, June 1994, pp. 334-342.
- 52 N. Mahadevamurty, T-C. Tsao and S. Hutchinson, “Multi-Rate Analysis and Design of Visual Feedback Digital Servo Control Systems,” *ASME Journal of Dynamic Systems, Measurement and Control*, Vol. 116, No. 1, March 1994, pp. 45-55.
- 53 S. A. Hutchinson and A. C. Kak, “SPAR: A Planner that Satisfies Operational and Geometric Goals in Uncertain Environments,” *AI Magazine*, Vol. 11, No. 1, Spring 1990, pp. 30-61.
- 54 S. A. Hutchinson and A. C. Kak, “Planning Sensing Strategies in a Robot Work Cell with Multi-Sensor Capabilities,” *IEEE Trans. on Robotics and Automation*, Vol. 5, No. 6, Dec. 1989, pp. 765-783.

Book Chapters

- 55 F. Chaumette, S. Hutchinson, and P. Corke, “Visual Servoing,” in *Springer Handbook of Robotics*, 2nd Edition, B. Siciliano and O. Khatib Eds., 2016.
- 56 W. Ma and S. Hutchinson, “Gradient Projection Methods for Constrained Image-Based Visual Servo,” in *Visual Servoing via Advanced Numerical Methods*, G. Chesi and K. Hashimoto, Eds. Springer-Verlag, Heidelberg, Germany, LNCIS 401, 2010, pp. 253-274.
- 57 S. Bhattacharya and S. Hutchinson, “On the Existence of Nash Equilibrium for a Visibility Based Pursuit Evasion Game,” in *Algorithmic Foundations of Robotics VIII*, G. Chirikjian, H. Choset, M. Morales and T. Murphey, Eds. Springer-Verlag, Heidelberg, Germany, 2010, pp. 251-266.
- 58 J. Davidson and S. Hutchinson, “A Sampling Hyperbelief Optimization Technique for Stochastic Systems,” in *Algorithmic Foundations of Robotics VIII*, G. Chirikjian, H. Choset, M. Morales and T. Murphey, Eds. Springer-Verlag, Heidelberg, Germany, 2010, pp. 217-231.
- 59 A. Sarmiento, J. Espinoza, R. Murrieta-Cid, S. Hutchinson, “A Motion Planning Strategy for Rapidly Finding an Object with a Mobile Manipulator in 3-D Environments,” in *Proc. of the 7th Mexican Int’l. Conf. on Artificial Intelligence: Advances in Artificial Intelligence*, Alexander Gelbukh and Eduardo F. Morales, Eds., Springer-Verlag LNCS 5317, 2008, pp. 562-572.
- 60 F. Chaumette and S. Hutchinson, “Visual Servoing and Visual Tracking,” in *Springer Handbook of Robotics*, B. Siciliano and O. Khatib Eds., 2008.
- 61 R. Murrieta-Cid, A. Sarmiento, T. Muppirala, S. Hutchinson, R. Monroy, M. Alencastre-Miranda, L. Muoz-Gmez and R. Swain, “A Framework for Reactive Motion and Sensing Planning: A Critical Events-Based Approach,” in *Proc. of the 5th Mexican Int’l. Conf. on Artificial Intelligence: Advances in Artificial Intelligence*, A. Gelbukh, A. Albornoz, H. Terashima-Marn Eds., Springer-Verlag LNCS 3789, 2005, pp. 990-1000.
- 62 S. Hutchinson and P. Leven, “Planning Collision-Free Paths Using Probabilistic Roadmaps,” in *Handbook of Geometric Computing: Applications in Pattern Recognition, Computer Vision, Neuralcomputing, and Robotics*, Eduardo Bayro Corrochano, Ed., Springer Verlag, Heidelberg, 2005, pp. 717-748.
- 63 A. Sarmiento, R. Murrieta-Cid and S. Hutchinson, “A Multi-robot Strategy for Rapidly Searching a Polygonal Environment,” in *Advances in Artificial Intelligence – IBERAMIA*, C. Lemaître, C. A. Reyes, J. A. González Eds., Springer-Verlag, Heidelberg, LNCS 3315, 2004, pp. 484-493.

- 64 P. I. Corke, S. A. Hutchinson and N. R. Gans, "Partitioned Image-Based Visual Servo Control: Some New Results," in *Sensor Based Intelligent Robots*, G. D. Hager, H. I. Christensen, H. Bunke, R. Klein Eds., Springer LNCS 2238, 2002, pp. 122-140.
- 65 P. Leven and S. Hutchinson, "Toward Real-Time Motion Planning in Dynamic Environments," in *Algorithmic and Computational Robotics: New Directions*, B. R. Donald, K. M. Lynch and D. Rus Eds., A. K. Peters, Natick, MA, 2001, pp. 363-376.
- 66 J. Reed and S. A. Hutchinson, "Data Fusion for Inspection of Electronic Components," in *Applications of NDT Data Fusion*, X. Gros Ed., Kluwer Academic Publishers, Norwell, MA, 2001, pp. 105-128.
- 67 K. Nickels and S. A. Hutchinson, "Integrated Object Models for Robust Visual Tracking," in *Robust Vision for Vision-Based Control of Motion*, M. Vincze and G.D. Hager Eds., IEEE Press, 2000, pp. 30-51.
- 68 S. M. LaValle and S. A. Hutchinson, "Considering Multiple-Surface Hypotheses in a Bayesian Hierarchy," in *Selected SPIE Papers on CD-ROM, Vol 8: Mathematical Imaging and Vision*, Gerhard Ritter Ed., SPIE Press, 1999.
- 69 M. J. Shaw, N. Ahuja, S. A. Hutchinson, "Coordination, Collaboration, and Control of Multirobot Systems," in *Handbook of Industrial Robotics*, S. Y. Nof, Ed., John Wiley & Sons Ltd., 1999, pp. 423-438.
- 70 M. Barbehenn and S. A. Hutchinson, "Toward Incremental Geometric Robot Motion Planning," in *Practical Motion Planning in Robotics: Current Approaches and Future Directions*, K. Gupta and A. del Pobil, Eds., John Wiley & Sons Ltd., 1998, pp. 133-152.
- 71 A. Fox and S. A. Hutchinson, "Exploiting Visual Constraints in the Synthesis of Uncertainty-Tolerant Motion Plans," in *The Algorithmic Foundations of Robotics*, K. Goldberg, D. Halperin, J.C. Latombe and R. Wilson, Eds., A. K. Peters, Boston, MA, 1995.
- 72 S. A. Hutchinson and A. C. Kak, "Multi-Sensor Strategies Using Dempster/Shafar Belief Accumulation," in *Data Fusion in Robotics and Machine Intelligence*, M. A. Abidi, S. C. Thomopoulos and R. C. Gonzalez, Eds., Academic Press, Cambridge, MA, 1992, pp. 165-205.
- 73 S. A. Hutchinson and A. C. Kak, "FProlog: A Language to Integrate Logic and Functional Programming for Automated Assembly," in *Control and Programming in Advanced Manufacturing*, K. Rathmill, Ed., IFS Publications Ltd, UK, 1988, pp. 361-371.

Proceedings of Technical Meetings

- 74 J. Hoff, A. Ramezani, S.-J. Chung, and S. Hutchinson, "Reducing Versatile Bat Wing Conformations to a 1-DoF Machine," in M. Cutkosky, P. Verschure, T. Prescott, M. Mangan, M. Desmulliez, A. Mura, Eds., *Biomimetic and Biohybrid Systems: The 6th Int'l. Conf. on Biomimetic and Biohybrid Systems*, Lecture Notes in Artificial Intelligence, Springer-Verlag, (to appear).
- 75 A. Ramezani, U. Syed, J. Hoff, S.-J. Chung, and S. Hutchinson, "Describing Robotic Bat Flight with Stable Periodic Orbits," in M. Cutkosky, P. Verschure, T. Prescott, M. Mangan, M. Desmulliez, A. Mura, Eds., *Biomimetic and Biohybrid Systems: The 6th Int'l. Conf. on Biomimetic and Biohybrid Systems*, Lecture Notes in Artificial Intelligence, Springer-Verlag, (to appear).
- 76 U. Syed, A. Ramezani, S.-J. Chung, S. Hutchinson, "From Rousettus aegyptiacus Landing to Robotic Landing: Regulation of CG-CP Distance Using a Nonlinear Closed-Loop Feedback," *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, May 2017 (to appear).
- 77 L. Lanari and S. Hutchinson, "Optimal Double Support Zero Moment Point Trajectories for Bipedal Locomotion," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, 2016, pp. 5162-5168.
- 78 K. Meier, S.-J. Chung, S. Hutchinson, "Visual-Inertial Curve Slam," *Proc. IEEE/RSJ Int'l Conf. on*

Intelligent Robots and Systems, 2016, pp. 1238-1245.

- 79 J. Hoff, A. Ramezani, S.-J. Chung, and S. Hutchinson, "Synergistic Design of a Bio-Inspired Micro Aerial Vehicle with Articulated Wings," *Proc. Robotics: Science and Systems (RSS)*, Ann Arbor, Michigan, June 18-22, 2016.
- 80 A. Ramezani, X. Shi, S.-J. Chung, and S. Hutchinson, "Bat Bot (B2), A Biologically Inspired Flying Machine," *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, May 16-21, 2016, pp. 3219-3226.
- 81 H. Park, S. Hutchinson, "An Efficient Algorithm for Fault-Tolerant Rendezvous of Multi-Robot Systems with Controllable Sensing Range," *Proc. IEEE International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, May 16-21, 2016, pp. 358-365.
- 82 A. Ramezani, X. Shi, S.-J. Chung, S. Hutchinson, "Modeling and Nonlinear Flight Controller Synthesis of a Bat-Inspired Micro Aerial Vehicle," *Proc. AIAA Guidance, Navigation, and Control Conference*, San Diego, CA, Jan. 2016, AIAA 2016-1376..
- 83 L. Lanari, S. Hutchinson, "Planning Desired Center of Mass and Zero Moment Point Trajectories for Bipedal Locomotion," *Proc. IEEE-RAS Int'l. Conf. on Humanoid Robots*, 2015, pp. 637-642.
- 84 A. Ramezani, X. Shi, S.-J. Chung, S. Hutchinson, "Lagrangian Modeling and Flight Control of Articulated-Winged Bat Robot," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, 2015, pp. 2867 - 2874.
- 85 L. Lanari, S. Hutchinson "Inversion-based gait generation for humanoid robots," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, 2015, pp. 1592 - 1598.
- 86 H. Park, S. Hutchinson, "A Distributed Robust Convergence Algorithm for Multi-robot System," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, 2015, pp. 2980 - 2985.
- 87 T. Yang, L. Rice, A. David, S. Hutchinson and Y.-K. Jan, "Myoelectric modeling of joystick control for an adaptive smart wheelchair," *Proc. Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) Annual Conference*, Denver, CO, June 11-14, 2015.
- 88 J. Yang, S.-J. Chung, S. Hutchinson, M. Kise, and D. Johnson, "Omnidirectional-Vision-Based Estimation for Containment Detection of a Robotic Mower," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, 2015, pp. 6344-6351.
- 89 M. Labastida-Valdes, L. A. Torres-Méndez and S. A. Hutchinson, "Using the Motion Perceptibility Measure to Classify Points of Interest for Visual-Based AUV Guidance in a Reef Ecosystem," *MTS/IEEE OCEANS 15*, Washington, USA, October 19-22, 2015, pp. 1-6.
- 90 A. Taghvaei, S. Hutchinson, P. Mehta, "A Coupled-Oscillators-based control Architecture for Locomotory Gaits," *Proc. 53rd Conf. on Decision and Control*, 2014, pp. 3487-3492.
- 91 L. Lanari, S. Hutchinson, L. Marchionni, "Boundedness Issues in Planning of Locomotion Trajectories for Biped Robots," *Proc. IEEE-RAS Int'l. Conf. on Humanoid Robots*, 2014, pp. 951-958.
- 92 H. Park, S. Hutchinson, "A Distributed Optimal Strategy for Rendezvous of Multi-Robots with Random Node Failures," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, 2014, pp. 1155-1160.
- 93 H. Park, S. Hutchinson, "Robust Optimal Deployment in Mobile Sensor Networks with Peer-to-Peer Communication," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, 2014, pp. 2144-2149.
- 94 H. Yoon, R. F. Wang, S. Hutchinson, "Modeling User's Driving-Characteristics in a Steering Task to Customize a Virtual Fixture based on Task-Performance," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, 2014, pp. 625-630.

- 95 A. Paranjape, K. Meier, S.-J. Chung, S. Hutchinson, "Optimum Spatially Constrained Turns for Agile Micro Aerial Vehicles," *Proc. AIAA Guidance, Navigation, and Control Conference*, Boston, MA, August 2013, AIAA 2013-4941.
- 96 J. Yang, A. Dani, S.-J. Chung, S. Hutchinson, "Inertial-Aided Vision-Based Localization and Mapping in a Riverine Environment with Reflection Measurements," *Proc. AIAA Guidance, Navigation, and Control Conference*, Boston, MA, August 2013, AIAA 2013-5246.
- 97 T. Bretl, S. Hutchinson, "Robust Coverage by a Mobile Robot of a Planar Workspace," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, pp. 4582-4587, 2013.
- 98 H. Park, S. Hutchinson, "Worst-Case Performance of a Mobile Sensor Network Under Individual Sensor Failure," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, pp. 895-900, 2013.
- 99 J. Yang, S.-J. Chung, S. Hutchinson, D. Johnson, M. Kise, "Vision-Based Localization and Mapping for an Autonomous Mower," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, pp. 3655-3662, 2013.
- 100 A. Paranjape, K. Meier, X. Shi, S.-J. Chung, S. Hutchinson, "Motion Primitives and 3-D Path Planning for Fast Flight Through a Forest," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, pp. 2940-2947, 2013.
- 101 H. Park, S. Hutchinson, "Worst-Case Performance of Rendezvous Networks in the Presence of Adversarial Nodes," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, pp. 5579-5585, 2013.
- 102 A. Dani, G. Panahandeh, S.-J. Chung, S. Hutchinson, "Image Moments for Higher-Level Feature Based Navigation," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, pp. 602-609, 2013.
- 103 G. Panahandeh, M. Jansson, S. Hutchinson, "IMU-Camera Data Fusion: Horizontal Plane Observation with Explicit Outlier Rejection," *Proc. IEEE Int'l. Conf. on Indoor Positioning and Indoor Navigation (IPIN)*, 2013.
- 104 Z. McCarthy, T. Bretl, S. Hutchinson, "Proving Path Non-Existence Using Sampling and Alpha Shapes," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, pp. 2563-2569, 2012.
- 105 D. Bonnie, S. Candido, T. Bretl, S. Hutchinson, "Modelling Search with a Binary Sensor Utilizing Self-Conjugacy of the Exponential Family," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, pp. 3975-3982, 2012.
- 106 T. Bretl, S. Hutchinson, "Robust Optimal Deployment of Mobile Sensor Networks," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, pp. 671-676, 2012.
- 107 Dushyant Rao, Soon-Jo Chung, Seth Hutchinson "CurveSLAM: An Approach for Vision-Based Navigation without Point Features," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, pp. 4198-4204, 2012.
- 108 A. Dani, S.-J. Chung, S. Hutchinson, "Observer Design for Stochastic Nonlinear Systems using Contraction Theory," *Proc. 51st Conf. on Decision and Control*, pp. 6028-6035, 2012.
- 109 A. Durand Petiteville, S. Hutchinson, V. Cadenat, M. Courdresses, "2D Visual Servoing for a Long Range Navigation in a Cluttered Environment," *Proc. 50th IEEE Conf. on Decision and Control and European Control Conference*, pp. 5677-5682, 2011.
- 110 P. Salaris, L. Pallottino, S. Hutchinson, and A. Bicchi, "From Optimal Planning to Visual Servoing With Limited FOV," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, pp. 2817-2824, 2011.
- 111 H. Yoon, S. Hutchinson, "The Mathematical Model and Control of Human-Machine Perceptual Feed-

- back System,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, pp. 2070-2075, 2011.
- 112 S. Candido and S. Hutchinson “Minimum Uncertainty Robot Navigation using Information-guided POMDP Planning,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, pp. 6102 - 6108, 2011.
- 113 J. Yang, D. Rao, S.-J. Chung, and S. Hutchinson, “Monocular Vision based Navigation in GPS Denied Riverine Environments,” *Proc. AIAA Infotech at Aerospace Conference*, St. Louis, MO, Mar. 2011.
- 114 S. Candido and S. Hutchinson, “Minimum Uncertainty Robot Path Planning using a POMDP Approach,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, pp. 1408-1413, 2010.
- 115 S. Candido, J. Davidson, and S. Hutchinson “Exploiting Domain Knowledge in Planning for Uncertain Robot Systems Modeled as POMDPs,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, pp. 3596 - 3603, 2010.
- 116 R. Tatsambon, H. Yoon, A. Cherubini, F. Chaumette, and S. Hutchinson, “Coarsely Calibrated Visual Servoing of a Mobile Robot Using a Catadioptric Vision System,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, pp. 5432 - 5437, 2009.
- 117 S. Bhattacharya, S. Hutchinson and T. Basar, “Game Theoretic Analysis of Pursuit-Evasion Game with Visibility Constraints,” *Proc. American Control Conference*, pp. 373-378, 2009.
- 118 S. Candido and S. Hutchinson, “Detecting Intrusion Faults in Remotely Controlled Systems,” *Proc. American Control Conference*, pp. 4968-4973, 2009.
- 119 S. Candido, Y.T. Kim and S. Hutchinson, “An Improved Hierarchical Motion Planner for Humanoid Robots,” *Proc. IEEE-RAS Int’l. Conf. on Humanoid Robots*, Daejeon, Korea, 2008, pp. 654-661.
- 120 S. Bhattacharya and S. Hutchinson, “On the Existence of Nash Equilibrium for a Visibility Based Pursuit Evasion Game,” *Proc. Workshop on the Algorithmic Foundations of Robotics*, 2008.
- 121 J. Davidson and S. Hutchinson, “A Sampling Hyperbelief Optimization Technique for Stochastic Systems,” *Proc. Workshop on the Algorithmic Foundations of Robotics*, 2008.
- 122 J. Davidson and S. Hutchinson, “Hyper-particle Filtering for Stochastic Systems,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, 2008, pp. 2770-2777.
- 123 R. Murrieta-Cid, R. Monroy, S. Hutchinson and J.-P. Laumond, “A Complexity Result for the Pursuit-Evasion Game of Maintaining Visibility of a Moving Evader,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, 2008, pp. 2657-2664.
- 124 S. Kloder and S. Hutchinson, “Partial Barrier Coverage: Using Game Theory to Optimize Probability of Undetected Intrusion in Polygonal Environments,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, 2008, pp. 2671-2676.
- 125 S. Bhattacharya and S. Hutchinson, “Approximation Schemes for Two-Player Pursuit Evasion Games with Visibility Constraints,” *Proc. Robotics: Science and Systems IV*, 2008, pp. 81-88.
- 126 S. Candido, Y.T. Kim and S. Hutchinson, “A Workspace Decomposition for Hierarchical Motion Planning with Humanoid Robots,” *Proc. Int’l. Conf. on Advanced Robotics*, Jeju island, South Korea, 2007.
- 127 S. Kloder and S. Hutchinson, “Barrier Coverage for Variable Bounded-Range Line-of-Sight Guards,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, April 2007 pp. 391 - 396.
- 128 N. Gans and S. Hutchinson, “A Stable Vision-Based Control Scheme for Nonholonomic Vehicles to Keep a Landmark in the Field of View,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, April 2007 pp. 2196 - 2201.
- 129 G. Lopez-Nicolas, S. Bhattacharya, J.J. Guerrero, C. Sagues, and S. Hutchinson, “Switched Homography-

- Based Visual Control of Differential Drive Vehicles with Field-of-View Constraints,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, April 2007 pp. 4238 - 4244.
- 130 S. Bhattacharya, S. Candido, and S. Hutchinson “Motion Strategies for Surveillance,” *Proc. Robotics: Science and Systems III*, Atlanta, GA, June, 2007, pp. 249-256.
 - 131 N.R. Gans and S. A. Hutchinson, “Visual Servo Velocity and Pose Control of a Wheeled Inverted Pendulum through Partial-Feedback Linearization,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, 2006, pp. 3823-3828.
 - 132 S. Bhattacharya and S. Hutchinson, “Controllability and Properties of Optimal Paths for a Differential Drive Robot with Field-of-View Constraints,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, Orlando, 2006 pp. 1624 - 1629.
 - 133 R. Katz and S. Hutchinson “Efficiently Biasing PRMs with Passage Potentials,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, Orlando, 2006 pp. 889 - 894.
 - 134 R. Murrieta-Cid, L. Munoz, M. Alencastre, A. Sarmiento, S. Kloder, S. Hutchinson, F. Lamiroux and J.P. Laumond, “Maintaining Visibility of a Moving Holonomic Target at a Fixed Distance with a Non-Holonomic Robot,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, Edmonton, Canada, 2005, pp. 2687 - 2693.
 - 135 T. Muppirala, R. Murrieta-Cid and S. Hutchinson “Optimal Motion Strategies Based on Critical Events to Maintain Visibility of a Moving Target,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, Barcelona, 2005, pp. 3837-3842.
 - 136 A. Sarmiento, R. Murrieta-Cid and S. Hutchinson “A Sample-based Convex Cover for Rapidly Finding an Object in a 3-D Environment,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, Barcelona, 2005, pp. 3497-350.
 - 137 S. Kloder and S. Hutchinson “Path Planning for Permutation-Invariant Multi-Robot Formations,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, Barcelona, 2005, pp. 1797-1802.
 - 138 A. Sarmiento, R. Murrieta-Cid and S. Hutchinson, “Planning Expected-Time Optimal Paths for Searching Known Environments,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, Sendai, Japan, 2004, pp. 872-878.
 - 139 N.R. Gans and S. A. Hutchinson, “Multi-Attribute Utility Analysis in the Choice of a Vision-based Robot Controller,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, Sendai, Japan, 2004, pp. 355-362.
 - 140 B. Chambers and S. Hutchinson, “Integrated Tracking and Control Using Condensation-based Critical-Point Matching,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, Sendai, Japan, 2004, pp. 949-956.
 - 141 S. Bhattacharya, R. Murrieta-Cid and S. Hutchinson, “Path Planning for a Differential Drive Robot: Minimal Length Paths - a Geometric Approach,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, Sendai, Japan, 2004, pp. 2793-2798.
 - 142 S. Kloder, S. Bhattacharya and S. Hutchinson, “A Configuration Space for Permutation-Invariant Multi-Robot Formations,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, New Orleans, 2004, pp. 2746-2751.
 - 143 R. Murrieta-Cid, A. Sarmiento, S. Bhattacharya and S. Hutchinson, “Maintaining Visibility of a Moving Target at a Fixed Distance: the Case of Observer Bounded Speed,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, New Orleans, 2004, pp. 479-484.
 - 144 A. Sarmiento, R. Murrieta-Cid and S. Hutchinson, “An Efficient Strategy for Rapidly Finding an Object in a Polygonal World,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, Las

Vegas, 2003, pp. 1153-1158.

- 145 R. Murrieta-Cid, A. Sarmiento and S. Hutchinson, "On the Existence of a Strategy to Maintain a Moving Target within the Sensing Range of an Observer Reacting with Delay," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, Las Vegas, 2003, pp. 1184-1191.
- 146 B. Chambers, J. Durand, N. Gans and S. Hutchinson, "Dynamic feature point detection for visual servoing using multiresolution critical-point filters," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, Las Vegas, Oct. 2003, pp. 504-509.
- 147 J. C. Davidson and S. A. Hutchinson, "Recognition of Traversable Areas for Mobile Robotic Navigation in Outdoor Environments," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, Las Vegas, 2003, pp. 297-304.
- 148 N.R. Gans and S. A. Hutchinson, "An asymptotically stable switched system visual controller for eye in hand robots" *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, Las Vegas, 2003, pp. 735 - 742
- 149 J. Durand and S. A. Hutchinson, "Real-Time Object Tracking using Multi-Resolution Critical Points Filters," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Taipei, Taiwan, 2003, pp. 1682-1687.
- 150 N.R. Gans and S. A. Hutchinson, "An experimental study of hybrid switched system approaches to visual servoing" *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Taipei, Taiwan, 2003, pp. 3061 - 3068
- 151 A. Sarmiento, R. Murrieta-Cid and S. A. Hutchinson "A Strategy for Searching an Object with a Mobile Robot," *Proc. Int'l. Conf. on Advanced Robotics*, Coimbra, Portugal, June, 2003 pp. 234-239.
- 152 R. Murrieta-Cid, A. Sarmiento, and S. A. Hutchinson "A Motion Planning Strategy to Maintain Visibility of a Moving Target at a Fixed Distance in a Polygon," *Proc. Int'l. Conf. on Advanced Robotics*, Coimbra, Portugal, June, 2003, pp. 228-233.
- 153 N. Gans and S. Hutchinson, "Switching Approaches to Visual Servo Control," *Proc. IEEE Workshop on Visual Servoing*, Lausanne, Switzerland, 2002 (invited).
- 154 N. Gans and S. Hutchinson, "A Switching Approach to Visual Servo Control," *Proc. 17th IEEE International Symposium on Intelligent Control*, Vancouver, Canada, 2002, pp. 770-760 (invited).
- 155 S. Akella and S. Hutchinson, "Coordinating the Motions of Multiple Robots with Specified Trajectories," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Washington D.C., 2002, pp. 624-631.
- 156 N. R. Gans, P. I. Corke and S. A. Hutchinson, "Performance Tests of Partitioned Approaches to Visual Servo Control," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Washington D.C., 2002, pp. 1616-1623.
- 157 P. Leven and S. Hutchinson, "Using Manipulability to Bias Sampling During the Construction of Probabilistic Roadmaps," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Washington D.C., 2002, pp. 2134-2140.
- 158 N. R. Gans, P. I. Corke and S. A. Hutchinson, "Comparison of Robustness and Performance of Partitioned Image Based Visual Servo Systems," *Proc. Australian Conference on Robotics and Automation*, Sydney, 2001.
- 159 P. Ranganathan, J.B. Hayet, M. Devy, S. Hutchinson and F. Lerasle, "Topological Navigation and Qualitative Localization for Indoor Environments Using Multisensory Perception," *Proc. Ninth International Symposium on Intelligent Robotic Systems*, Toulouse, July, 2001.
- 160 P. Leven and S. Hutchinson, "Robust, Compact Representations for Real-Time Path Planning in Changing Environments," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, Maui, Oct.

- 2001, pp. 1483-1490.
- 161 R. Swain-Oropeza, M. Devy and S. Hutchinson, "Sensor-Based Navigation in Cluttered Environments," *Proc. IEEE/RSJ Int'l Conf. on Intelligent Robots and Systems*, Maui, Oct. 2001, pp. 1662-1669.
 - 162 P. Leven and S. Hutchinson, "Toward Real-Time Motion Planning in Dynamic Environments," *Proc. Workshop on the Algorithmic Foundations of Robotics*, Dartmouth, March, 2000.
 - 163 P. I. Corke and S. A. Hutchinson, "Recent Results in Visual Servo Control," *Proc. IEEE Workshop on Integrating Sensors into Mobility and Manipulation*, San Francisco, April, 2000 (invited).
 - 164 P. I. Corke and S. A. Hutchinson, "Real-Time Vision, Tracking and Control," *Proc. IEEE Int'l Conf. on Robotics and Automation*, San Francisco, April 2000, pp. 622-629 (invited).
 - 165 P. I. Corke and S. A. Hutchinson, "A New Hybrid Image-Based Visual Servo Control Scheme," *Proc. 39th Conf. on Decision and Control*, Sydney, Dec., 2000, pp. 2521-2526. [Also in *Proc. 31st Int'l Symposium on Robotics*, Montreal, May 2000, pp. 30-35, and *Proc. Eighth IEEE Mediterranean Conference on Control and Automation*, Rio, Greece, July, 2000.]
 - 166 P. Leven and S. Hutchinson, "Real-Time Motion Planning in Changing Environments: Some Preliminary Results," *Proc. on 31st Int'l Symposium on Robotics*, Montreal, May 2000, pp. 12-17.
 - 167 K. Nickels and S. Hutchinson, "Measurement Error Estimation for Feature Tracking," *Proc. IEEE Int'l Conf. on Robotics and Automation*, Detroit, 1999, pp. 3230-3235.
 - 168 T. Kurpjuhn, K. Nickels, A. Hauck and S. Hutchinson, "Development of a Visual-Space Mouse," *Proc. IEEE Int'l Conf. on Robotics and Automation*, Detroit, 1999, pp. 2527-2532.
 - 169 R. Kelly, F. Reyes, J. Moreno and S. Hutchinson, "A Two Loops Direct Visual Control of Direct-Drive Planar Robots with Moving Target," *Proc. IEEE Int'l Conf. on Robotics and Automation*, Detroit, 1999, pp. 599-604.
 - 170 P. Leven, D. Burschka, S. Hutchinson, "Perception-Based Motion Planning for Indoor Exploration," *Proc. IEEE Int'l Conf. on Robotics and Automation*, Detroit, 1999, pp. 695-701.
 - 171 H. Rifai, I. Bloch, S. A. Hutchinson, J. Wiart and L. Garnero, "Segmentation of the Skull in MRI Volumes Using Deformable Model and Taking the Partial Volume Effect into Account," *Proc. SPIE Medical Imaging Symposium*, San Diego, 1999, pp. 288-299.
 - 172 K. Nickels and S. A. Hutchinson, "Weighting Observations: The use of Kinematic Models in Object Tracking" *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Leuven, Belgium, May, 1998. pp. 1677-1682.
 - 173 K. Nickels and S. A. Hutchinson, "Integrated Object Models for Robust Visual Tracking," *Proc. IEEE Workshop on Robust Vision for Vision-based Control of Motion*, Leuven, Belgium, May, 1998 (invited).
 - 174 K. Nickels and S. Hutchinson, "Characterizing the Uncertainties in Point Feature Motion for Model-Based Object Tracking," *Proc. IEEE Workshop on New Trends in Image-Based Robot Servoing*, Grenoble, France, 1997, pp. 53-63 (invited).
 - 175 M. Barbehenn and S. Hutchinson, "Toward Incremental Geometric Robot Motion Planning," *Proc. IEEE Workshop on Practical Motion Planning in Robotics*, April, 1996 (invited).
 - 176 S. Hutchinson, "Using Projective Geometry to Derive Constraints for Calibration-Free Visual Servo Control," *Proc. Sixth Int'l Symposium on Robotics and Manufacturing*, Montpellier, France, pp. 305-310, 1996.
 - 177 S. LaValle and S. A. Hutchinson, "Optimal Motion Planning for Multiple Robots Having Independent

- Goals,” *Proc. IEEE Int’l Conf. on Robotics and Automation*, Minneapolis, pp. 2847-2852, 1996.
- 178 S. LaValle and S. A. Hutchinson, “Evaluating Motion Strategies under Nondeterministic or Probabilistic Uncertainties in Sensing and Control,” *Proc. IEEE Int’l Conf. on Robotics and Automation*, Minneapolis, pp. 3034-3039, 1996.
- 179 B. Bishop, A. Castano, S. Hutchinson, R. Sharma, P. Shirkey, M. W. Spong, N. Srinivasa, “Some Experiments in Vision-Based Robotics at the University of Illinois,” *Proc. IEEE Vision for Robotics Workshop*, 1995 (invited).
- 180 R. L. Castaño and S. A. Hutchinson, “A Probabilistic Framework for Grouping Image Features,” *Proc. the IEEE Int’l Symposium on Computer Vision*, pp. 611-616, 1995.
- 181 R. Sharma, S. LaValle and S. A. Hutchinson, “Optimizing Robot Motion Strategies for Assembly with Stochastic Models of the Assembly Process,” *Proc. IEEE Int’l Symposium on Assembly and Task Planning*, 1995.
- 182 M. Barbehenn and S. Hutchinson, “Toward an Exact Incremental Geometric Robot Motion Planner,” *Proc. IEEE/RSJ Int’l Conf. on Intelligent Robots and Systems*, Pittsburgh, 1995, pp. 39-44, vol. 3.
- 183 R. Sharma and S. Hutchinson, “Optimizing Hand/Eye Configuration for Visual-Servo Systems,” *Proc. IEEE Int’l Conf. on Robotics and Automation*, Nagoya, Japan, pp. 172-177, 1995.
- 184 B. Bishop, S. Hutchinson and M. Spong, “On the performance of Direct Visual Servo Systems,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, San Diego, 1994, pp. 168-173 (invited).
- 185 J. Reed and S. Hutchinson, “Parameter Estimation for Elliptical Shapes Using Image Sequences,” *Proc. IEEE Int’l Conf. on Multisensor Fusion and Integration for Intelligent Systems*, 1994, pp. 567-574.
- 186 S. LaValle and S. A. Hutchinson, “An Objective-Based Stochastic Framework for Manipulation Planning.” *Proc. IEEE Int’l Conf. on Intelligent Robots and Systems*, Munich, Germany, pp. 1772-1779, 1994.
- 187 G. D. Hager and S. Hutchinson, “Visual Servoing: Achievements, Issues, and Applications,” *Proc. IEEE Workshop on Visual Servoing: Achievements, Applications and Open Problems*, 1994.
- 188 R. Sharma and S. Hutchinson, “Evaluating a Camera Position for Vision-Guided Manipulation,” *Proc. AAAI Spring Symposium on Physical Interaction and Manipulation*, 1994.
- 189 S. LaValle and S. Hutchinson “Path Selection and Coordination for Multiple Robots via Nash Equilibria,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, San Diego, 1994, pp. 1847-1852.
- 190 R. Sharma and S. Hutchinson “On the Observability of Robot Motion Under Active Camera Control,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, San Diego, 1994, pp. 162-167.
- 191 M. Barbehenn, P. Chen and S. Hutchinson, “An Efficient Hybrid Planner in Changing Environments,” *Proc. IEEE Int’l. Conf. on Robotics and Automation*, San Diego, 1994, pp. 2755-2761.
- 192 N. Mahadevamurty, T-C. Tsao and S. Hutchinson, “Multi-Rate Analysis and Design of Visual Feedback Digital Servo Control Systems,” DSC-Vol. 50/PED-Vol. 63, Symposium on Mechatronics, *Proc. ASME Winter Annual Meeting*, 1993, pp. 7-14.
- 193 Mark Spong, Gerald DeJong and Seth Hutchinson, “Integration of Machine Learning and Sensor-Based Control in Intelligent Robotic Systems,” *Proc. American Control Conf.*, 1993, pp. 352-356 (invited).
- 194 E. Welton, S. Hutchinson and M. Spong, “A Modular, Interdisciplinary Approach to Undergraduate Robotics Education,” *Proc. Frontiers in Education*, Washington, D.C., 1993, pp. 714-719.

- 195 S. LaValle and S. Hutchinson, "Game Theory as a Unifying Structure for a Variety of Robot Tasks," *Proc. IEEE Int'l. Symposium on Intelligent Control*, 1993, pp. 429-434.
- 196 S. LaValle and S. Hutchinson, "On Considering Uncertainty and Alternatives in Low-Level Vision," *Proc. Ninth Conf. on Uncertainty in Artificial Intelligence*, 1993, pp. 55-65.
- 197 S. M. LaValle and S. A. Hutchinson, "Bayesian Region Merging Probability for Parametric Image Models," *Proc. IEEE Conf. on Computer Vision and Pattern Recognition*, New York, 1993, pp. 778-779.
- 198 S. M. LaValle, K. J. Moroney and S. A. Hutchinson, "Agglomerative Clustering on Range Data with a Unified Probabilistic Merging Function and Termination Criterion," *Proc. IEEE Conf. on Computer Vision and Pattern Recognition*, New York, 1993, pp. 798-799.
- 199 S. LaValle, K. J. Moroney and S. A. Hutchinson, "Methods for Numerical Integration of High-Dimensional Posterior Densities with Application to Statistical Image Models," *Proc. SPIE Conf. on Neural and Stochastic Methods in Image and Signal Processing*, 1993, pp. 292-303.
- 200 A. Fox and S. A. Hutchinson, "Exploiting Visual Constraints in the Synthesis of Uncertainty-Tolerant Motion Plans I: The Directional Backprojection," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Atlanta, 1993, pp. 305-310.
- 201 A. Fox and S. A. Hutchinson, "Exploiting Visual Constraints in the Synthesis of Uncertainty-Tolerant Motion Plans II: The Nondirectional Backprojection," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Atlanta, 1993, pp. 311-316.
- 202 M. Barbehenn and S. A. Hutchinson, "Efficient Search in Hierarchical Motion Planning Using Dynamic Single Source Shortest Paths Trees," *Proc. IEEE Int'l. Conf. on Robotics and Automation*, Atlanta, 1993, pp. 566-571.
- 203 R. Spence and S. A. Hutchinson, "Dealing with Unexpected Moving Obstacles by Integrating Potential Field Planning with Inverse Dynamics Control," *Proc. of the IEEE Int'l Conf. on Intelligent Robots and Systems*, Raleigh, 1992, pp. 1485-1490.
- 204 A. Castano and S. A. Hutchinson, "Hybrid Vision/Position Servo Control of a Robotic Manipulator," *Proc. of the IEEE Int'l Conf. on Robotics and Automation*, Nice, France, 1992, pp. 1264-1269.
- 205 S. Pandya and S. A. Hutchinson, "A Case-Based Approach to Robot Motion Planning," *Proc. of the IEEE Int'l Conf. on Systems Man and Cybernetics*, 1992, pp. 492-497.
- 206 S. M. LaValle and S. A. Hutchinson, "Representing Probability Distributions of Image Segments and Segmentations," *Proc. IEEE Int'l Conf. on Systems Man and Cybernetics*, 1992, pp. 1552-1557 (invited).
- 207 S. A. Hutchinson, "Planning Visually Controlled Robot Motions," *Proc. of the AAAI Fall Symposium on Sensory Aspects of Robotic Intelligence*, 1991, pp. 38-43.
- 208 A. Fox, A. Castano and S. A. Hutchinson, "Planning and Executing Visually Constrained Robot Motions" *Proc. of the SPIE Symposium on Advances in Intelligent Robotic Systems*, 1991.
- 209 S. A. Hutchinson, "Exploiting Visual Constraints in Robot Motion Planning," *Proc. of the IEEE Int'l Conf. on Robotics and Automation*, Sacramento, 1991, pp. 1722-1727.
- 210 M. Barbehenn and S. A. Hutchinson, "Learning Conditional Effects of Actions for Robot Navigation," *Proc. of the IEEE Int'l Conf. on Robotics and Automation*, Sacramento, 1991, pp. 260-265 [Also in *Proc. of the Florida Artificial Intelligence Research Symposium*, 1991, pp. 37-41].
- 211 M. Barbehenn and S. A. Hutchinson, "An Integrated Architecture for Learning and Planning in Robotic Domains," *Proc. of the AAAI Spring Symposium on Integrated Architectures*, 1991, pp. 15-19

[Reprinted in *ACM SIGART*, Vol. 2, No. 4, Aug. 1991, pp. 29-33].

- 212 S. M. LaValle and S. A. Hutchinson, "Considering Multiple Surface Hypotheses in a Bayesian Hierarchy," *Proc. of the SPIE Conf. on Stochastic Methods in Signal Processing, Image Processing, and Computer Vision*, 1991, pp. 1-15.
- 213 S. A. Hutchinson and A. C. Kak, "Extending the Classical AI Planning Paradigm to Robotic Assembly Planning," *Proc. of the IEEE Conf. on Robotics and Automation*, Cincinnati, 1990, pp. 182-189.
- 214 A. C. Kak, S. A. Hutchinson, C. H. Chen, S. N. Gottschlich, and K. D. Smith, "Coordinated Use of Multiple Sensors in a Robotic Workcell," *Proc. of the NATO Advanced Research Workshop on Multisensor Fusion for Computer Vision*, Grenoble, France, July 1989.
- 215 S. A. Hutchinson, R. L. Cromwell and A. C. Kak, "Applying Uncertainty Reasoning to Model Based Object Recognition," *Proc. of the IEEE Conf. on Computer Vision and Pattern Recognition*, 1989, pp. 541-548.
- 216 S. A. Hutchinson and A. C. Kak, "A Task Planner for Simultaneous Fulfillment of Operational, Geometric and Uncertainty-Reduction Goals," *Proc. of the Workshop on Human-Machine Symbiotic Systems*, ORAU 89/C-140, Oak Ridge National Lab., 1988.
- 217 A. C. Kak, S. A. Hutchinson and K. A. Andres, "Planning and Reasoning in Sensor Based Robotics," *Proc. of the IEEE Int'l Workshop on Intelligent Robots and Systems*, 1988, pp. 239-245.
- 218 S. A. Hutchinson and A. C. Kak, "Applying Uncertainty Reasoning to Planning Sensing Strategies in a Robot Work Cell with Multi-Sensor Capabilities," *Proc. of the IEEE Symposium on Intelligent Control*, Tokyo, Japan, 1988, pp. 129-134.
- 219 S. A. Hutchinson, R. L. Cromwell and A. C. Kak, "Planning Sensing Strategies in a Robot Work Cell with Multi-Sensor Capabilities," *Proc. of the IEEE Int'l Conf. on Robotics and Automation*, Philadelphia, 1988, pp. 1068-1075.
- 220 S. A. Hutchinson and A. C. Kak, "FProlog: A Language to Integrate Logic and Functional Programming for Automated Assembly," *Proc. of the IEEE Int'l Conf. on Robotics and Automation*, San Francisco, 1986, pp. 904-909.

Technical Reports

- 221 S. Hutchinson, G. Hager and P. Corke, "A Tutorial on Visual Servo Control," Yale University, Department of Computer Science, Research Report YALEU/DCS/RR-1068, March, 1995.
- 222 R. Sharma, S. LaValle and S. Hutchinson, "Optimizing Robot Motion Strategies for Assembly with Stochastic Models of the Assembly Process," University of Illinois at Urbana-Champaign, Technical Report UIUC-BI-AI-RCV-94-11, 1994.
- 223 S. LaValle and S. Hutchinson, "Multiple-robot Motion Planning Under Independent Objectives," University of Illinois at Urbana-Champaign, Technical Report UIUC-BI-AI-RCV-94-10, 1994.
- 224 R. Sharma and S. Hutchinson, "Motion Perceptibility and its Application to Active Vision-Based Servo Control," University of Illinois at Urbana-Champaign, Technical Report UIUC-BI-AI-RCV-94-05, 1994.
- 225 S. LaValle and S. Hutchinson, "A Bayesian Segmentation Methodology for Parametric Image Models," University of Illinois at Urbana-Champaign, Technical Report UIUC-BI-AI-RCV-93-06, 1993.
- 226 M. Barbehenn and S. Hutchinson, "Efficient Search and Hierarchical Motion Planning By Dynamically Maintaining Single-Source Shortest Paths Trees," University of Illinois at Urbana-Champaign, Technical Report UIUC-BI-AI-RCV-93-04, 1993.

- 227 S. LaValle and S. A. Hutchinson, "Image Segmentation Using a Bayesian Region Merging Probability," University of Illinois at Urbana-Champaign, Technical Report UIUC-BI-AI-RCV-93-02, 1993.
- 228 A. Castano and S. A. Hutchinson, "Visual Compliance: Task-Directed Visual Servo Control," University of Illinois at Urbana-Champaign, Technical Report UIUC-BI-AI-RCV-93-01, 1993.
- 229 A. Fox and S. A. Hutchinson, "Exploiting Visual Constraints in the Synthesis of Uncertainty-tolerant Motion Plans," University of Illinois at Urbana-Champaign, Technical Report UIUC-BI-AI-RCV-92-05, 1992.
- 230 S. A. Hutchinson and A. C. Kak, "A Task Planner for Simultaneous Fulfillment of Operational, Geometric and Uncertainty-Reduction Goals," Purdue University Technical Report TR 88-46, 1988.

Editorials and Other Articles

- 231 S. Hutchinson, "Farewell Editorial," *IEEE Trans. on Robotics*, Vol. 29, No. 5, Oct. 2013, pp. 1069-1070.
- 232 S. Hutchinson, "Surviving the Review Process," *IEEE Robotics and Automation Magazine*, Volume 17, Issue 4, Dec. 2010 pp. 101-104.
- 233 G. Hager, M. Hebert and S. Hutchinson, "Editorial: Special Issue on Vision and Robotics, Parts I and II," *Int'l. Journal of Computer Vision*, Vol. 74, No. 3, 2007, pp. 217-218; and *Int'l Journal of Robotics Research*, Vol. 26, No. 7, 2007, pp. 639-640.
- 234 S. Hutchinson, "Editorial," *IEEE Trans. on Robotics*, Vol. 24, No. 6, Dec. 2008, pg. 1261.
- 235 S. Hutchinson, "RAS Conference Editorial Board," *IEEE Robotics and Automation Magazine*, Volume 13, Issue 4, Dec. 2006 pg. 6.
- 236 K. Goldberg, S. Hutchinson, J.-D. Boissonnat and J. Burdick, *Editorial: Special Issue on WAFR 2002*, *Int'l Journal of Robotics Research*, Vol. 23, No. 7-8, 2004, pp. 671-672.
- 237 G. Hager and S. Hutchinson, "Introduction to the Special Section on Vision-Based Control of Robot Manipulators," *IEEE Trans. on Robotics and Automation*, Vol. 12, No. 5, Oct. 1996, pp. 649-650.