

## John R. Spletzer

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EDUCATION      **University of Pennsylvania**, Philadelphia, Pennsylvania USA

Ph.D., Computer and Information Science (CIS), August 2003

- Dissertation Topic: "Sensor Fusion Techniques for Cooperative Localization in Robot Teams"
- Advisor: Camillo J. Taylor

M.S., Computer and Information Science, August 1999

**Johns Hopkins University**, Baltimore, Maryland USA

Master of Mechanical Engineering, May, 1993

**Temple University**, Philadelphia, Pennsylvania USA

B.S., Mechanical Engineering, May, 1989

PROFESSIONAL EXPERIENCE      **Lehigh University**, Bethlehem, Pennsylvania USA

*Assistant Professor*

**Aug 2003 - present**

**University of Pennsylvania**, Philadelphia, Pennsylvania USA

*Visiting Professor*

**Fall 2007**

Co-team Leader, the Ben Franklin Racing Team. This was a collaboration between the University of Pennsylvania, Lehigh University, and Lockheed Martin ATL. Our entry into the DARPA Urban Challenge autonomous vehicle race was one of only eleven finalists chosen to compete in the final event, and one of only six teams to complete the race. We also ranked 1 out of 78 Track B (self-funded) teams, and were the only one to finish the 55 mile race.

**University of Pennsylvania**, Philadelphia, Pennsylvania USA

*Research Assistant*

**Sep 1998 - Aug 2003**

*Instructor, CSE110 Introduction to C Programming*

**May 2000 - Jul 2000**

**Hospital of the University of Pennsylvania**, Philadelphia, Pennsylvania USA

*Software Engineer*

**Oct 2001 - Feb 2002**

Implemented three-dimensional imaging algorithms using MRI data to develop virtual bone biopsy (VBB) technology, a non-invasive alternative for automatically characterizing the levels of osteoporosis in patients.

**U.S. Army Test and Evaluation Command**, Aberdeen Proving Ground, MD USA

*Project Test Engineer*

**Jun 1989 - May 1998**

Supervised test design and execution for both laboratory and field experiments of Nuclear, Biological, Chemical (NBC) defense programs and related sensor systems. Some projects of note included:

- *Integrated Air-to-Air Weapon Systems (INTAAWS) for the AH-64A Apache attack helicopter*
- *Short and Long Range Biological Standoff Detection Systems* - UV and IR based LIDARs designed to detect, map and track aerosol clouds at ranges of 5 and 30 km, respectively.
- *Driver's Vision Enhancer (DVE)* - a passive IR thermal imager for driving in conditions of darkness and degraded visibility.
- *M93A1 NBC Reconnaissance System (NBCRS)*
- *Chemically and Biologically Protected Shelter (CBPS)*

RESEARCH  
INTERESTS

Intelligent vehicle systems, assistive devices, computer vision, real-time image processing, and multi-agent systems.

PUBLICATIONS

**Book Chapters (4)**

1. R. Alur, A. Das, J. Esposito, R. Fierro, Y. Hur, G. Grudic, V. Kumar, I. Lee, J. P. Ostrowski, G. Pappas, J. Southall, J. Spletzer, and C. Taylor, "A framework and architecture for multirobot coordination," *Experimental Robotics VII*, D. Rus and S. Singh (eds.), Springer, LNCIS 271, pp. 303-312, 2001.
2. A. Das, J. Spletzer, V. Kumar and C. J. Taylor, "A Distributed Multi-Robot System for Cooperative Manipulation," *Multi-Robot Systems: From Swarms to Intelligent Automata*, Alan C. Schultz and Lynne E. Parker (eds.), Kluwer Academic Press, 2002.
3. J. Derenick, C. Thorne and J. Spletzer, "Hybrid Free-space Optics/Radio Frequency (FSO/RF) Networks for Mobile Robot Teams," *Multi-Robot Systems: From Swarms to Intelligent Automata*, Alan C. Schultz and Lynne E. Parker (eds.), Springer, March 2005
4. J. Derenick and J. Spletzer, "Second-order cone programming (SOCP) Techniques for Coordinating Large-scale Robot Teams in Polygonal Environments," accepted to *Advances in Cooperative Control and Optimization, Lecture Notes in Control and Information Science*, Springer, April 2007

**Journal Papers (7 + 1 submitted)**

1. A. K. Das, R. Fierro, V. Kumar, J. P. Ostrowski, J. Spletzer, and C. J. Taylor, "A Framework for Vision Based Formation Control," *Multi-Robot Systems: A Special Issue of IEEE Transactions on Robotics and Automation*, vol 18, num 5, pp 813-825, Oct 2002.
2. R. Fierro, A. Das, J. Spletzer, R. Alur, J. Esposito, Y. Hur, G. Grudic, V. Kumar, I. Lee, J. P. Ostrowski, G. Pappas, J. Southall and C. J. Taylor, "A framework and architecture for multirobot coordination," *International Journal of Robotics Research (IJRR)*, vol 21, num 10-11, pp 977-995, Oct-Nov 2002.

3. J. Spletzer and C. J. Taylor, "Dynamic Sensor Planning and Control for Optimally Tracking Targets," *International Journal of Robotics Research (IJRR)*, vol 22, num 1, pp 7-20, Jan 2003.
4. V. Isler, S. Khanna, J. Spletzer and C.J. Taylor, "Target Tracking with Distributed Sensors: the Focus of Attention Problem", in the *Journal of Computer Vision and Image Understanding: Special Issue on Attention and Performance in Computer Vision*, Volume 100, Issues 1-2, October-November 2005
5. J. Derenick and J. Spletzer, "Convex Optimization Strategies for Coordinating Large-scale Robot Formations," *IEEE Transactions on Robotics*, Volume 23, Issue 6, Pages 1252-1259, Dec 2007
6. C. Gao, I. Hoffman, T. Miller, T. Panzarella, and J. Spletzer, "Autonomous Docking of a Smart Wheelchair for the Automated Transport and Retrieval System (ATRS)," the *Journal of Field Robotics*, Volume 24, Issue 4-5, Pages 203-222, Apr/May 2008.
7. Jon Bohren, Tully Foote, Jim Keller, Alex Kushleyev, Daniel Lee, Alex Stewart, Paul Vernaza, Jason Derenick, John Spletzer, and Brian Satterfield, "Little Ben: The Ben Franklin Racing Team's Entry in the 2007 DARPA Urban Challenge," accepted to the *Journal of Field Robotics*, May 2008
8. J. Derenick, J. Spletzer, and Ani Hsieh, "An Optimal Approach to Collaborative Target Tracking with Performance Guarantees," submitted to the *Journal of Intelligent and Robotic Systems*, Apr 2008

#### **Refereed Conference Proceedings (19)**

1. A. Das, R. Fierro, V. Kumar, J. Southall, J. Spletzer, and C. Taylor, "Real-time vision based control of a nonholonomic mobile robot," *IEEE International Conference on Robotics and Automation (ICRA)*, Seoul, Korea, May 2001, pp. 1714-1719.
2. J. Spletzer, A.K. Das, R. Fierro, C.J. Taylor, V. Kumar, and J.P. Ostrowski, "Cooperative Localization and Control for Multi-robot Manipulation," in *Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hawaii, USA, Oct 2001.
3. J. Spletzer and C. J. Taylor, "A Framework for Sensor Planning and Control with Applications to Vision Guided Multi-Robot Systems," *IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, Hawaii, USA, Dec 2001 (8% oral)
4. J. Spletzer and C. J. Taylor, "Sensor Planning and Control in a Dynamic Environment," *IEEE International Conference on Robotics and Automation (ICRA)*, Washington DC, USA, May 2002
5. G. A. S. Pereira, V. Kumar, J. Spletzer, C. J. Taylor and M. F. M. Campos, "Cooperative Transport of Planar Objects by Multiple Mobile Robots Using Object Closure," in *Proceedings of the 8th International Symposium on Experimental Robotics (ISER)*, Jul 2002.
6. A. Das, J. Spletzer, V. Kumar and C. J. Taylor, "Ad Hoc Networks for Localization and Control of Mobile Robots," *IEEE International Conference on Decision and Control*, Dec 2002.
7. G. Kantor, S. Singh, R. Peterson, D. Rus, A. Das, V. Kumar, G. Pereira and J.

- Spletzer, "Distributed Search and Rescue with Robot and Sensor Teams," 4th International Conference on Field and Service Robotics, July 2003
8. V. Isler, J. Spletzer, S. Khanna, and C.J. Taylor, "Target Tracking with Distributed Sensors: The Focus of Attention Problem," in Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)," pp. 792-798, Las Vegas, NM, Oct 2003.
  9. J. Spletzer and C. J. Taylor, "A Bounded Uncertainty Approach to Multi-Robot Localization," in Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 1258-1265, Las Vegas, NV, Oct 2003.
  10. J. Spletzer and R. Fierro, "Optimal Positioning Strategies for Shape Changes in Robot Teams," in the Proceedings of the IEEE International Conference on Robotics and Automation, pp. 754-759, Barcelona, April 2005 (44%)
  11. Edmund F. LoPresti, Jim Osborn, Thomas Panzarella, Thomas Panzarella, Jr., and John Spletzer, "Automatic Transport and Retrieval System for Power Wheelchairs," Rehabilitative Engineering and Assistive Technology Society of North America (RESNA), June 2005
  12. J. Derenick, C. Thorne, and J. Spletzer, "On the Deployment of a Hybrid FSO/RF Mobile Ad-hoc Network," IEEE/RSJ International Conference on Intelligent Robots and Systems, Edmonton, August 2005 (54%)
  13. H. Sermeno-Villalta and J. Spletzer, "Vision-based Control of a Smart Wheelchair for the Automated Transport and Retrieval System (ATRS)," IEEE International Conference on Robotics and Automation (ICRA), May 2006 (39%)
  14. J. Derenick, C. Mansley and J. Spletzer, "Efficient Motion Planning Strategies for Large-scale Sensor Networks," the Seventh International Workshop on the Algorithmic Foundations of Robotics (WAFR), July 2006 (49%)
  15. D. Coleman, J. Spletzer and M. Arnold, "Target-Logic Circuits Built with Holonomic Field Programmable Robot Arrays," the 32nd Euromicro Conference on Software Engineering and Advanced Applications (SEAA 2006), Cavtat/Dubrovnik, Croatia, August 2006
  16. C. Gao, I. Hoffman, T. Panzarella, and J. Spletzer, "Automated Transport and Retrieval System (ATRS): A Technology Solution to Automobility for Wheelchair Users," the 6th International Conference on Field and Service Robotics (FSR2007), July 2007 (45% oral)
  17. C.J. Taylor and J. Spletzer, "A Bounded Approach to Cooperative Localization Using Relative Bearing Constraints," IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2007), San Diego, October 2007 (52%)
  18. J. Derenick, J. Spletzer and M. Ani Hsieh, "A Graph Theoretic Approach to Optimal Target Tracking for Mobile Robot Teams," IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2007), San Diego, October 2007 (52%)
  19. C. Gao, I. Hoffman, T. Miller, T. Panzarella, and J. Spletzer, "Performance Characterization of LIDAR Based Localization for Docking a Smart Wheelchair System," IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2007) Workshop on Assistive Technologies: Rehabilitation and Assistive Robotics, October 2007

### **Invited Papers (1)**

1. R. Fierro, C. Branca and J. Spletzer, "On-line Optimization-based Coordination of Multiple Unmanned Vehicles", IEEE International Conference On Networking, Sensing and Control, Tucson, AZ, March 2005.

### **Video Proceedings (1)**

1. A. Das, J. Spletzer, V. Kumar and C. J. Taylor, "Cooperative Sensing and Control for Multiple Autonomous Robot Vehicles," IEEE International Conference on Robotics and Automation, Washington DC, USA, May 2002

### **HONORS AND AWARDS**

1. Finalist, DARPA Urban Challenge, Nov 2007
2. Frost and Sullivan 2007 North American Product Innovation of the Year Award (Advanced Mobility Aids) for the ATRS
3. P. C. Rossin Assistant Professorship, 2006-2008
4. University Fellowship, University of Pennsylvania, 1998-1999
5. Commander's Award for Civilian Service, U.S. Army Test and Evaluation Command, May 1998

### **RESEARCH GRANTS**

#### **Competitively Awarded Research Grants**

1. National Science Foundation, Center for Engineering Logistics and Distribution (CELDi) Designated Project, "Merging Mobile Robotics and RFID Technologies for an Automated Asset Locating System (AALS)," Jun 08 - May 09, \$50,000
2. The Technology Collaborative PA Assistive Technology Commercialization Initiative (PATCI), Sep 07 - Aug 09, \$40,000
3. PA-Department of Community & Economic Development, PITA, "Intelligent Driving Aids for the Elderly and Disabled," Jul 2007 - Jun 2009, \$68,574
4. National Science Foundation (NSF) Partnership for Innovation (PFI), "Development, Technology Transfer, and Commercialization of the Automated Transport and Retrieval System (ATRS)", Mar 2007-Feb 2009, co-PIs T. Panzarella (Freedom Sciences) and S. Singh (CMU), \$598,076
5. PA-Department of Community & Economic Development, PITA, "An Outdoor Machine Vision System (OMVS) for the ATRS," Nov 2005 - Mar 2008, \$52,955
6. PA-Department of Community & Economic Development, PITA, "Free-space Optical (FSO) Networks for Mobile Robot Teams," Nov 2004 - Mar 2006, \$26,165
7. PA-Department of Community & Economic Development via Enterprise Systems Center, "Design and Development of a Proof of Concept ATRS," PI Emory Zimmers (Lehigh), Nov 2004 - Dec 2005, \$68,263

#### **Non-competitive Research Grants**

1. Faculty Research Grant, Lehigh University, Apr 2008, \$3,500
2. Thales Communications, Inc., and Lehigh University, "The DARPA Urban Challenge," Dec 06 - Nov 07, \$50,000
3. Lehigh Innovation Seed Grant, Lehigh University, "An Automatic Camera Calibration System for the Automated Transport and Retrieval System (ATRS),"

May 2006, \$10,000

### **Contract/Consulting Work**

1. Sponsored Research Agreement, Freedom Sciences LLC, “Developmental Support for the Automated Transport and Retrieval System (ATRS),” Aug 2006, \$40,000

### **PROFESSIONAL PRESENTATIONS**

#### **Invited Talks**

1. “Dynamic Sensor Planning and Control for Optimal Target Tracking,” Robotics Institute, Carnegie Mellon University, Nov 2002
2. “Dynamic Sensor Planning and Control for Optimal Target Tracking,” University of South Florida, February 2003
3. “Dynamic Sensor Planning and Control for Optimal Target Tracking,” Lehigh University, February 2003
4. “Automated Transport and Retrieval System (ATRS): Personal Automobility for Wheelchair Users,” University of Pennsylvania, Feb 2008
5. “Robotics for Personal Automobility,” University of New Mexico, Feb 2008
6. “Estimation Strategies for Real-World Robot Systems,” U.S. Naval Academy, Apr 2008
7. “Ubiquitous Robotics: Preparing for the Coming Invasion,” Keynote Speech, 2008 Pennsylvania Association for Computer and Information Science Educators Conference (PACISE 2008), April 2008
8. “The Ben Franklin Racing Team and the DARPA Urban Challenge,” Field Robotics Center, Carnegie Mellon University, May 2008
9. “Towards Equality in Personal Mobility for Wheelchair Users,” IEEE Spring Symposium Washington, D.C. - Northern Virginia: Technology for the Golden Years, May 2008
10. “The Ben Franklin Racing Team and the DARPA Urban Challenge,” Draper Laboratories Symposium, *Beyond the Urban Challenge*, Jun 2008

#### **Refereed Presentations**

1. “A Framework for Sensor Planning and Control with Applications to Vision Guided Multi-Robot Systems,” IEEE Computer Society Conference on Computer Vision and Pattern Recognition, Hawaii, USA, Dec 2001
2. “A Distributed Multi-Robot System for Cooperative Manipulation,” Third International Multi-Robot Systems Workshop, Washington, DC, Kluwer
3. “Sensor Planning and Control in a Dynamic Environment,” IEEE International Conference on Robotics and Automation, Washington DC, USA, May 2002
4. “A Bounded Error Approach to Multi-Robot Localization,” International Conference on Intelligent Robots and Systems (IROS), Las Vegas, NV, Oct 2003.
5. “Optimal Positioning Strategies for Shape Changes in Robot Teams,” IEEE International Conference on Robotics and Automation, Barcelona, April 2005
6. “Second-order cone programming (SOCP) Techniques for Coordinating Large-scale Robot Teams in Polygonal Environments,” in the 7th International Conference on Cooperative Control and Optimization, Jan 2007

7. "Automated Transport and Retrieval System (ATRS): A Technology Solution to Automobility for Wheelchair Users," the 6th International Conference on Field and Service Robotics (FSR2007), July 2007
8. "The Ben Franklin Racing Team and the DARPA Urban Challenge," IEEE International Conference on Robotics and Automation Workshop on the 2007 DARPA Urban Challenge: From Algorithms to Vehicles, May 2008

#### PATENTS

1. T. Panzarella, T. Panzarella Jr., M. Martin and John Spletzer, "System for Storing and Retrieving a Personal Transportation Vehicle," patent pending

#### MEDIA COVERAGE

1. "Researchers Show off Laser-guided Wheelchair that Docks with Vehicles," Engadget, 30 Apr 08
2. "Robotic Wheelchair Docks like a Spaceship," New Scientist, 30 Apr 08
3. "Driverless Little Ben Makes Big Finish in Competition," the Morning Call, 8 Nov 2007
4. "Outsiders Challenged Big Guys at Robot Car Race," Reuters, Nov 2007
5. "Underdog Nearly Victorious," Geekmo.de, Nov 2007
6. "I, Robot (Part I)," Autoline Detroit, Nov 2007
7. "BFRT in Gizmag Article," Gizmag, Nov 2007
8. "Video: Mac Minis, Cardboard and House Fans Power Urban Challenge Underdog Ben Franklin Racing," TG Daily, Nov 2007
9. "This little car can drive itself home Team of students from Lehigh, Penn modify Prius for international contest," The Morning Call, 16 Sep 07
10. "Life is a Highway: New technology allows wheelchair users to drive traditional automobiles," Advance Magazine, Pages 30-31, Jul 2007,
11. "Building a Better Wheelchair for Car Drivers," Photonics Spectra Journal, Feb 2007,
12. "Automatic Wheelchair Loading," New Mobility Magazine, Feb 2007
13. "ATRS to Make Entering/Exiting Vehicles Easier for Handicapped Individuals," Engadget/PhysOrg and Science Daily Technology Websites, Dec 2006
14. ATRS at the *World Congress and Expo on Disabilities*, Fox News Philadelphia Affiliate Channel 29, CBS News Philadelphia Affiliate Channel 3, NBC News Philadelphia Affiliate Channel 10, Nov 2006
15. "Stepping into the Future: Assistive Robotics in & out of the Lab," *Quest - Journal of the Muscular Dystrophy Association*, vol. 13, no. 5, pp. 64, Sep-Oct 2006.
16. ATRS at the *World Congress and Expo on Disabilities*, ABC News Philadelphia Affiliate Channel 6, NBC News Philadelphia Affiliate Channel 10, Dec 2005
17. "ATRS Helps Disabled Drivers, Passengers," *North Penn Register*, 29 Aug 2005
18. Pennsylvania State Senator Rob Wonderling's Newsletter featuring the ATRS, Winter 2006

TEACHING &  
ADVISING

**Courses Taught**

1. Spring 2008: CSE360/460 Introduction to Mobile Robotics (8 Undergraduate/3 Graduate)
2. Spring 2007: CREG258 Senior Design (7 Undergraduate)
3. Spring 2007: CSE398/498 Advanced Topics in Mobile Robotics - The DARPA Urban Challenge (9 Undergraduate/1 Graduate)
4. Fall 2006: CREG257 Senior Design (7 Undergraduate)
5. Fall 2006: CSE397/497 Real-time Image Processing (7 Undergraduate, 8 Graduate)
6. Spring 2006: ECE258 Senior Design (co-instructor)
7. Spring 2006: CSE398/498 Robocup (2 Graduate)
8. Fall 2005: ECE257 Senior Design (co-instructor)
9. Fall 2005 CSE397/497 Introduction to Mobile Robotics (6 Undergraduate/11 Graduate)
10. Spring 2005: CSE398/498 Robocup (21 Undergraduate/5 Graduate)
11. Fall 2004: CSE398/498 Real-time Image Processing (16 Undergraduate/7 Graduate)
12. Spring 2004: ECE201 Computer Architecture (48 Undergraduate)
13. Fall 2003 (12 Undergraduate/6 Graduate)

**Research Advising**

Current Undergraduate Students

1. Thomas Miller, B.S. Computer Engineering, May 2007-present, co-author of 1 journal and 1 conference workshop paper, with another conference paper pending, expected graduation May 2008 (Presidential Scholar)

Master Degree Students

1. Christopher Wojciechowski, M.S., CSE, Jan 2006-present, expected graduation May 2008
2. Christopher Mansley, May 2005-Aug 2005 (now a Ph.D. student at Rutgers University)
3. Christopher Spencer, M.S. CSE, Sep 2003-May 2005 (now at Lutron Electronics)
4. Christopher Thorne, M.S. MEM, May 2004-Aug 2005 (now a Ph.D. student at the University of Pennsylvania)
5. Humberto Sermeno Villalta, M.S. CSE, Jan 2004-Dec 2005 (now an Assistant Professor at the University of El Salvador)

PhD Students

1. Jason Derenick, Ph.D. CSE, Aug 2003-present, expected graduation May 2009
2. Chao Gao, Ph.D. CSE, Sep 2005-present, expected graduation May 2010

**University Service**

## Service to the College

1. College tours, VADER Laboratory, Mondays and Fridays (2006-present)
2. Computer Engineering Committee Member, 2006-present
3. Volunteer, Lehigh Life Days program, April 2006

## Service to Interdisciplinary Programs

1. Department representative for the Autonomous and Intelligent Systems (AIS) initiative, a collaborative effort between the CSE, ECE, and MEM departments
2. Helped author and implement the successful 2004-2005 “Autonomous and Intelligent Systems (AIS) Laboratory” Undergraduate Laboratory Enhancement proposal, a joint CSE, ECE, and MEM submission
3. Integrated Mechanical Engineering graduate/undergraduate students into ongoing research alongside Computer Science/Engineering students

## Service to Department

1. Admissions Committee, CSE Department, 2004-2005
2. Computer Facilities/Utilization Committee, CSE Department, 2003-2004, 2006-present
3. CSE Open House/Candidate’s Day Presentations, 2005-2007
4. Faculty Recruiting Committee, 2005-2006
5. Graduate Program PhD Qualifier, 2005-present
6. Laboratory Renovations Committee, 2005-present
7. Recruiting, 2005-2006, 2007-2008

**Professional Activities**

## Synergistic Activities for the Robotics Community

1. NSF/CCC/CRA Roadmapping for Robotics Workshop: A Research Roadmap for Medical and Healthcare Robotics, June 2008
2. “The Sick LIDAR Matlab/C++ Toolbox,” currently being used by many universities as well as private technology companies, Mar 2008

## Conference Committees

1. Video Proceedings Committee, 2010 IEEE International Conference on Robotics and Automation
2. Program Committee, 2008 IEEE International Conference on Computer Vision and Pattern Recognition
3. Program Committee, 2006 European Conference on Computer Vision
4. Program Committee, 2006 IEEE International Conference on Computer Vision and Pattern Recognition
5. Program Committee, 2005 AAI National Conference on Artificial Intelligence
6. Program Committee, 2005 IEEE International Conference on Computer Vision and Pattern Recognition
7. Program Committee, 2004 AAI National Conference on Artificial Intelligence

#### Panel Service

1. NSF Proposal Review Panel, March 2007
2. NSF Proposal Ad Hoc Review, 2006

#### Conferences/Workshops Organized

1. Co-organizer with Prof. Chuah and Phoebe Institute on Aging, *Conference on Aging Services and Technology*, Lehigh University, June 2008

#### Meeting/Symposia Sessions Chaired

1. Session Chair, IEEE/RSJ International Conference on Intelligent Robots and Systems, Edmonton, Oct 2007
2. Session Chair, IEEE International Conference on Robotics and Automation (ICRA), Orlando, May 2006
3. Session Chair, IEEE/RSJ International Conference on Intelligent Robots and Systems, Edmonton, August 2005

#### Reviewer (Journals Only)

1. IEEE Robotics and Automation Society Magazine
2. IEEE Transactions on Automation Science and Engineering
3. IEEE Transactions on Circuits and Systems
4. IEEE Transactions on Pattern Analysis and Machine Intelligence
5. IEEE Transactions on Robotics
6. IEEE Transactions on Robotics and Automation
7. IEEE Transactions on Sensor Networks
8. International Journal of Computer Vision
9. International Journal of Robotics Research
10. Journal for Field Robotics

#### Outreach Activities

1. Engineering Academy Advisory Board for the Atlantic County, New Jersey Institute of Technology High School, 2006
2. Sponsor, TechGYRLS Lehigh Field Trip, Feb 2006