

ROBIN ROBERSON MURPHY

Curriculum Vitae
as of 3/08

Computer Science and Engineering
University of South Florida
4202 East Fowler Avenue, ENC 2506
Tampa, FL 33620-5399
e-mail:murphy@cse.usf.edu <http://www.cse.usf.edu/murphy>
Office: (813) 974-4756 Fax: (813) 974-5456

I am a founder of the field of rescue robotics; my personal goal is to enable emergency responders to routinely save lives through physically situated artificial intelligence (robots, sensor networks, etc.). This has led to a research career based on three principles: basic research should be informed by field experiences and working with users, meaningful solutions require teams of multi-disciplinary researchers addressing solutions within the ecology of the domain, and industry-agency-university linkages must be established in order to accelerate the diffusion of innovation. Through the Center for Robot-Assisted Search and Rescue, I have introduced ground, air, and sea robots to disaster response, participating in the World Trade Center disaster (2001), La Conchita, CA, mudslides (2005), Hurricanes Charley (2004), Dennis (2005), Katrina (2005), and Wilma (2005), the Newmont Midas (2007) and Crandall Canyon (2007) mine disasters, and the Berkman Plaza II parking garage collapse (2007) and subsequent forensic structural investigation (2008). As fieldwork made it clear to me that the lack of understanding the relationship between humans, robots, and domains was the major stumbling block in diffusing these innovations to disaster management, my basic research turned to human-robot interaction where I have produced a series of seminal papers, often in collaboration with a former graduate student from psychology, Dr. Jenny Burke. In 2002, I founded the Institute for Safety Security Rescue Technology at USF, a state of Florida Type II center, in order to facilitate multi-disciplinary teams in computer science, health systems, networks, psychology, and sensors. To enable the transfer of research to industry and the emergency response community, I established in 2003, in partnership with the University of Minnesota, the NSF Industry University Cooperative Research Center on safety, security, and rescue technology. While active in the robotics professional societies and in serving on defense and National Academies studies, I teach and advise students and have written the best-selling textbook, Introduction to AI Robotics (MIT Press, 2000), and am preparing a second edition. Dr. Burke, Prof. David Woods (Ohio State), and I have just signed a contract with MIT Press for Human-Robot Interaction, the first textbook on the subject.

EDUCATIONAL BACKGROUND

Ph.D. and Rockwell International Fellow Received September, 1992, in Computer Science. College of Computing, Georgia Institute of Technology.

- Thesis title: *An Architecture for Intelligent Robotic Sensor Fusion*, Thesis advisor: Ronald C. Arkin, area: Artificial Intelligence (mobile robotics, sensor fusion), minor: Computer Integrated Manufacturing Systems.
- Minor area: Computer Integrated Manufacturing Systems (CIMS) multidisciplinary program.

M.S. Received June, 1989, in Computer Science. School of Information and Computer Science, Georgia Institute of Technology. Funding: *Computer Integrated Manufacturing Systems Fellowship*.

B.M.E. Received August, 1980, in Mechanical Engineering. School of Mechanical Engineering, Georgia Institute of Technology.

EMPLOYMENT HISTORY (past 10 years)

• Employment: Academic

Director NSF I/UCRC Safety, Security, Rescue Research Center, and Site Director at University of South Florida, June, 2003, to Dec, 2006. Co-founded the center with University of Minnesota.

Professor, Department of *Computer Science and Engineering*, joint appointment in *Cognitive and Neural Science*, Department of Psychology, University of South Florida, August, 2003 to current. *First and only female full professor in the USF College of Engineering*.

Director, Institute for Safety Security Rescue Technology (which includes the Center for Robot-Assisted Search and Rescue), a State Type II center, January, 2002 to current. ISSRT has attracted close to \$10M of funding and has funded 14 faculty in Engineering, Arts & Sciences, and Information Technology.

Associate Professor, Department of *Computer Science and Engineering*, joint appointment in *Cognitive and Neural Science*, Department of Psychology, University of South Florida, August, 1998 to May, 2003.

Associate Director, Center for Robotics and Intelligent Systems, Colorado School of Mines, August, 1994 to May, 1998.

Assistant Professor, Department of Mathematical and Computer Sciences, Colorado School of Mines, August, 1992 to August, 1998.

• Employment: Industrial

Member, Board of Directors, Continental Divide Robotics, Inc., 2000-2004: CDR provides continuous parolee tracking and monitoring.

Co-owner, Chief Research Officer, 1997-1999: Rocky Mountain Automated Systems, Inc., a company specializing in applying artificial intelligence and sensor fusion to improve GPS tracking.

Consultant, Northrop Grumman Corporation, 1997-1999: advised on transfer of sensor failure and recovery research to unmanned aerial vehicle IRAD program.

HONORS AND AWARDS (past 10 years)

• Honors and Awards: National

Representative Research Program for CISE for the NSF Budget Rollout to Congress, Feb. 5, 2007, (One of 11 researchers selected to represent the National Science Foundation to Congress and the general public.)

US Air Force Exemplary Civilian Service Award from the US Air Force for distinguished service on the AF Scientific Advisory Board, 2005.

NSF CISE Distinguished Lecture, "Robot-Assisted Search and Rescue from 9/11 to Now: Where's the IT?" Nov. 11, 2002. *This lecture is given by scientists of the highest caliber and has been compared to the Turing Award lectures for NSF.*

Eagle Award, National Institute for Urban Search and Rescue, 2001. *(This is the highest award given and recognizes leadership in some aspect of search and rescue; in this case for role in introducing ground robots at the World Trade Center disaster.)*

IEEE Distinguished Visitor, IEEE Computer Society, 2001-2002.

Nils Nilsson Technical Achievement Award, American Association for Artificial Intelligence, 2000.
Minority Engineering Program Outstanding Faculty Award, Colorado School of Mines Minority Engineering Program, 1997-8.

Defense Science Study Group, Institute for Defense Analyses, DoD, 1998-1999.

“Colorado Institute Equity Excellence Award,” Colorado Institute for Gender Equity, 1997.

• **Honors and Awards: USF**

Honor Society of Phi Kappa Phi, USF Chapter Artist and Scholar of the Year Award, 2004.

USF Outstanding Faculty Research Achievement Award, 2003.

PUBLICATIONS (past 10 years)

• **Publications: Books**

1. **Burke, J.L., and Murphy, R.R.**, *Human-Robot Interaction*, MIT Press, in negotiation.
2. **Murphy, R.R.**, *Introduction to AI Robotics*, MIT Press, 2000. Best-selling textbook in area of AI robotics and translated into several languages, including Chinese. *Second edition in preparation.*
3. **Kortenkamp, D., Bonasso, P., and Murphy, R.R.**, co-editors, *Artificial Intelligence for Mobile Robots: Case Studies of Successful Systems*, MIT Press, publication Feb., 1998. *Michael Crichton cited this book in his bestseller, Prey, about swarm robots run amok.*

• **Publications: Chapters in Books**

1. **Murphy, R.R., and Burke, J.L.**, “The Safe Human-Robot Ratio,” *Human-Robot Interactions in Future Military Operations*, M. Barnes, F. Jensch, editors, to appear 2008.
2. **Murphy, R.R., Tadokoro, S., and Fiorini, P.**, “Rescue Robotics,” *Handbook of Robotics*, A. Zelinkski, B. Sciliano, editors, IEEE Press, to appear 2008.
3. **Riley, J., Murphy, R.R., and Endsley, M.**, “Situation Awareness in the Control of Unmanned Ground Vehicles,” *Human Factors for Remotely Operated Vehicles*, N. Cooke, H. Pringle, H. Pedersen, and O. Connor, editors, Elsevier Press, 2006.
4. **Casper, J., Micire, M., Hyams, J., and Murphy, R.**, “A Case Study of How Mobile Robot Competitions Promote Research,” *RoboCup 2001: Robot Soccer World Cup V*, Springer, A. Birk, S. Coradeschi, S. Tadokoro, editors, 2002.
5. **Murphy, R.R.** “Marsupial Robots,” *Robot Teams*, ed. T. Balch, L. Parker, editors, 2002, pp. 271-290.
6. **Blitch, J., Murphy, R., Durkin, T.**, “Mobile Semiautonomous Robots for Urban Search and Rescue,” *Encyclopedia of Microcomputers, vol. 28*, ed. Allen Kent, James G. Williams, 2002.
7. **Murphy, R.R., Casper, J., and Micire, M.**, “Potential Tasks and Research Issues of Mobile Robots in RoboCup Rescue,” *RoboCup-2000: Robot Soccer World Cup IV*, ed., Peter Stone, Tucker Balch, Gerhard Kraetschmar, Springer Verlag, Berlin, 2001., pp. 339-344.
8. **Murphy, R.R.**, “Fuzzy Logic for Fusion of Tactical Influences on Vehicle Speed Control,” *Fuzzy logic techniques for autonomous vehicle navigation*, A. Saffioti, D. Driankov, editors, 2001.

9. **Murphy, R.R., and Rosenblatt, M.**, “Robocamp: One Hands-on Week of Exploring Science through Robotics,” *Robots for Kids*, A. Druin, J. Hendler, editors, Academic Press, 2000, pp. 297-332.
10. **Murphy, R.R.**, “Coordination and Control of Sensing for Mobility using Action-Oriented Perception,” *Artificial Intelligence for Mobile Robots*, MIT Press, Feb., 1998.
11. **Murphy, R.R., and Hershberger, D.**, “Handling Sensing Failures with Partial Causal Models,” *Modelling and Planning for Sensor Based Intelligent Robot Systems*, Horst Bunke, Robert C. Bolles, and Hartmut Noltemeier, editors, World Scientific, 1997, pp. 96-110.
12. **Murphy, R.R., Lindner, J., and Taylor, B.**, “Sensor Fusion and Learning for Environmental Modeling”, *Modelling and Planning for Sensor Based Intelligent Robot Systems*, Horst Bunke, Takeo Kanade, and Hartmut Noltemeier, editors, World Scientific, 1995, pp. 191–208.
13. **Murphy, R.R.**, “Sensor Fusion”, *The Handbook of Brain Theory and Neural Networks*, Michael A. Arbib, editor, Bradford Books/The MIT Press, 1995, pp. 857–859.
14. **Murphy, R.R.**, “Visual Techniques for the Controlled Movement of Docking”, *NATO ASI Workshop on Active Perception and Robot Vision*, Arun K. Sood and Harry Wechsler, editors, Springer-Verlag, 1992, pp. 701–720.

• **Publications: In Refereed Journals**

***Invited Journal Articles**

1. **R.R. Murphy and S. Stover**, “Rescue Robots for Mudslides: A Descriptive Study of the 2005 La Conchita Mudslide Response,” *Journal of Field Robotics, special issue on Safety, Security and Rescue Robots*, Jan 2008.
2. **Murphy, R.**, “Human-Robot Interaction in Rescue Robotics,” *IEEE Systems, Man and Cybernetics Part A*, special issue on Human-Robot Interaction, vol.34, No.2, May 2004, pp. 138-153.
3. **Murphy, R.**, “Rescue Robotics for Homeland Security,” *Communications of the ACM*, special issue on Homeland Security, vol. 27, no. 3, March 2004, pp 66-69.

*** Regular Journal Articles In Review**

1. **Murphy, R.R., and Burke, J.L.**, “From Remote Tool to Shared Roles: Human-Robot Interaction in Teleoperation for Remote Presence Applications,” submitted to *IEEE Robotics and Automation Magazine, special issue on New Vistas and Challenges for Teleoperation*, 2008.
2. **Lindemuth, M., Murphy, R., Steimle, E., Armitage, W., Dreger, K., Elliot, T., Hall, M., Kalyadin, D., Kramer, J., Palankar, M., Pratt, K., and Griffin, C.**, “Sea-RAI: A Marsupial USV-UAV Team for Littoral Inspection” submitted to *IEEE Robotics and Automation Magazine*, 2008.
3. **Pratt, K., Murphy, R.R., Stover, S., and Griffin, C.**, “An Assessment of Autonomy Needs for Rotary-Wing MAVs based on Hurricane Katrina Deployments,” in review, *Autonomous Robots*, 2007.

***Accepted Regular Journal Articles**

1. **Murphy, R.R., Steimle, E., Griffin, C., Cullins, C., Hall, M., and Pratt, K.** “Cooperative Use of Unmanned Sea Surface and Micro Aerial Vehicle at Hurricane Wilma,” *Journal of Field Robotics*, to appear March 2008.

*** Journal Articles In Print (past 10 Years)**

1. **Bethel, C., and Murphy, R.R.**, “Non-facial/Non-verbal Affective Expressions for Appearance Constrained Robots,” *IEEE Transactions on Systems, Man and Cybernetics Part C*, Jan., 2008.
2. **Burke, J.L., Murphy, R.R., and Kidd, C.**, “Young Researchers in HRI Workshop 2006,” *Interaction Studies*, vol. 8, no. 2, 2007.
3. **Valavanis, K.P., Doitsidis, L., Long, M., and Murphy, R.R.**, “A Case Study of Fuzzy-Logic-Based Robot Navigation,” *IEEE Robotics and Automation Magazine*, vol. 13, no. 3, Sept 2006, pp. 93-107.
4. **Murphy, R. R.**, “Humans, robots, rubble, and research,” *interactions*, Volume 12, Number 2 (2005), Pages 37-39.
5. **Carlson, J., and Murphy R.R.**, “How UGVs Physically Fail in the Field,” *IEEE Transactions on Robotics*, Vol.21, no.3, June 2005, pp. 423 - 437.
6. **Murphy, R.R.** “NSF Summer Field Institute for Rescue Robots for Research and Response (R4),” *AI Magazine*, Vol. 25, No. 1, Spring 2004.
7. **Murphy, R. R.**, “Trial by Fire,” *IEEE Robotics and Automation Magazine*, Sept. 2004, vol. 11, issue 3, pp 50-61.
8. **Gage, A., Murphy, R., and Minten, B.**, “Shadowbowl 2003: Lessons Learned from a Reach-back Exercise with Rescue Robots,” *IEEE Robotics and Automation Magazine*, Sept. 2004, vol. 11, issue 3, pp 62-69.
9. **Burke, J., Murphy, R.R., Rogers, E., Scholtz, J., and Lumelsky, V.**, “Final Report for the DARPA/NSF Interdisciplinary Study on Human-Robot Interaction,” *IEEE Systems, Man and Cybernetics Part A*, vol.34, No.2, May 2004, pp. 103-112.
10. **Murphy, R. R., and Rogers, E.**, “Introduction to the Special Issue on Human-Robot Interaction,” *IEEE Systems, Man and Cybernetics Part A*, vol.34, No.2, May 2004, pp. 101-102.
11. **Burke, J., Murphy, R.R., Coovert, M., Riddle, D.**, “Moonlight in Miami: An Ethnographic Study of Human-Robot Interaction,” in USAR,” *Human-Computer Interaction*, special issue on Human-Robot Interaction, Volume 19, Nos. 1-2, 2004, pp. 85-116.
12. **Gage, A., and Murphy, R.R.**, “Sensor scheduling in mobile robots using incomplete information via Min-Conflict with Happiness,” *IEEE Transactions on Systems, Man and Cybernetics Part B*, Volume: 34, Issue: 1 , pp:454 - 467, Feb. 2004.
13. **Murphy, R.**, “Rescue Robots at the World Trade Center,” *Journal of the Japan Society of Mechanical Engineers*, special issue on Disaster Response Robotics, vol. 102, no. 1019, 2003, pp. 794-802.

14. **Casper, J., and Murphy, R.R.**, "Human-Robot Interaction during the Robot-Assisted Urban Search and Rescue Response at the World Trade Center," *IEEE Transactions on Systems, Man and Cybernetics*, vol. 33, no. 3, June 2003, pp. 367 -385.
15. **Murphy, R.R.**, "Rats, Robots, and Rescue," *IEEE Intelligent Systems*, Volume 17, Issue 5, Sep/Oct 2002 Page(s):7 - 9.
16. **Murphy, R.R., Osuka, M., and Schultz, A.**, "USAR Competitions for Physically Situated Agents," *IEEE Robotics and Automation Magazine*, special issue on Rescue Robotics, Sept 2002.
17. **Murphy, R.R.**, "RoboCup-Rescue Roadmap," *IEEE Robotics and Automation Magazine*, special issue on Rescue Robotics, Sept 2002.
18. **Murphy, R.R., Blich, J., and Casper, J.** "AAAI/RoboCup-2001 Urban Search and Rescue Events: Reality and Competition," *AI Magazine*, vol. 23, no.1, 2002, pp.37-42.
19. **Murphy, R., Lisetti, C., Irish, L., Tardif, R.**, "Emotion-Based Control of Cooperating Heterogeneous Mobile Robots," *IEEE Transactions on Robotics and Automation*, special issue on Multi-Robot Systems, vol. 18, no 5, Oct. 2002, pp. 744-757.
20. **Erkmen, A.M., Tsubouchi, T., and Murphy, R.**, "Mechatronics education: Guest Editorial," *IEEE Robotics and Automation Magazine*, Volume 8, Issue 2, June 2001 Page(s):4 - 4
21. **Murphy, R.R.**, "Competing for a Robotics Education," *IEEE Robotics and Automation Society Magazine*, June 2001, pp. 44-55.
22. **Minten, B., Murphy, R., Hyams, J., and Micire, M.**, "Low Order Complexity Vision-Based Docking," *IEEE Transactions on Robotics and Automation*, Volume: 17 Issue: 6 , Dec 2001 Page(s): 922 -930.
23. **Lopes, L.S.; Connell, J.H.; Dario, P.; Murphy, R.; Bonasso, P.; Nebel, B.; Nilsson, N.; Brooks, R.A.**, "Sentience in robots: applications and challenges," *IEEE Intelligent Systems*, Volume 16, Issue 5, Sep-Oct 2001 Page(s):66 - 69.
24. **Hyams, J., Powell, M., Murphy, R.R.**, "Position Estimation and Cooperative Navigation of Micro-rovers Using Color Segmentation," *Autonomous Robots*, special issue on CIRA'99, vol. 9, no. 1, August 2000, pp.7-16.
25. **Murphy, R.R.**, "Marsupial Robots for Urban Search and Rescue," *IEEE Intelligent Systems*, vol. 15, no. 2, March 2000, pp 14-19.
26. **Murphy, R.R.** "Using Robot Competitions in the Classroom to Promote Intellectual Development," *AI Magazine*, vol. 21, no.1, 2000, pp.77-90.
27. **Murphy, R., Hughes, K., Noll, E., and Marzilli, A.**, "Integrating Explicit Path Planning with Reactive Control for Mobile Robots using Trulla," *Robotics and Autonomous Systems*, no. 27, 1999, pp. 225-245.
28. **Murphy, R., and Hershberger, D.**, "Handling Sensing Failures in Autonomous Mobile Robots," *International Journal of Robotics Research*, vol. 18, no. 4, 1999, pp. 382-400.

29. **Murphy, R.R.**, “Case Studies of Gibson’s Ecological Approach to Mobile Robots,” *IEEE Transactions on Systems, Man and Cybernetics Part A: Systems and Humans*, vol 29, no. 1., Jan, 1999, pp 105-111.
30. **Murphy, R.**, “Teaching Image Computation in an Upper Level Elective on Robotics,” *International Journal of Pattern Recognition and Artificial Intelligence*, special issue on education, Vol. 12, no.8, 1998, pp 1081-1093.
31. **Murphy, R.R.**, “Sensor and Information Fusion for Improved Vision-Based Vehicle Guidance,” *IEEE Intelligent Systems and Their Applications*, special issue on Vision-Based Driving Assistance in Vehicles of the Future, Nov/Dec, 1998, pp 49-56.
32. **Murphy, R.R.**, “Dempster-Shafer Theory for Sensor Fusion in Autonomous Mobile Robots”, *IEEE Transactions on Robotics and Automation*, vol. 14, no.2, April, 1998, pp. 197–206.
33. **Hexmoor, H., Meeden, L., and Murphy, R.R.**, “Is Robot Learning A New Subfield? The Robolearn-96 Workshop,” *AI Magazine*, Winter, 1997, vol. 18, no. 4, pp. 149-152.

• **In Refereed Conference Proceedings (past 10 years)**

***In Review**

1. **Brian Day***, **Cindy Bethel**, **Robin Murphy**, **Jenny Burke**, “A Depth Sensing Display for Bomb Disposal Robots,” submitted to IROS-08.
2. **Jeff Craighead**, **Rodrigo Gutierrez**, **Jenny Burke**, **Robin Murphy**, “Validating The Search and Rescue Gaming Environment As A Robot Simulator By Performing A Simulated Anomaly Detection Task ” submitted to IROS-08.
3. **Pratt, K.**, **Murphy, R.R.**, **Burke, J.**, **Craighead, J.**, **Griffin, C.**, and **Stover, S.**, “Use of Tethered Small Unmanned Aerial System at Berkman Plaza II Collapse,” submitted to IROS-08.
4. **Gage, J.**, and **Murphy, R.R.**, “Evidential Inconsistency as an Affordance for Poor Sensing,” submitted to AAAI-08.

***Conference Papers Accepted**

1. **Murphy, R.R.**, **Pratt, K.**, and **Burke, J.L.** “Crew Roles and Operational Protocols for Rotary-Wing Micro-UAVs in Close Urban Environments,” *ACM/IEEE Human-Robot Interaction*, Amsterdam, March, 2008.

***Conference Papers In Print**

1. **Long, M.T.**, **Murphy, R.R.**, and **Hicinbothom, J.** “Social Roles for Taskability in Robot Teams,” to appear *IEEE International Conference on Intelligent Robots and Systems*, 2007.
2. **Craighead, J.**, **Murphy, R.R.**, and **Burke, J.** “A Survey of Commercial and Open Source Unmanned Vehicle Simulators,” *IEEE International Conference on Robotics and Automation*, 2007.
3. **Burke, J.**, and **Murphy, R.R.**, “RSVP: An Investigation of Remote Shared Visual Presence as Common Ground for Human-Robot Teams,” *ACM/IEEE Human-Robot Interaction*, 2007.

4. **Bethel, C., and Murphy, R.R.**, “Non-Facial/Non-Verbal Methods of Affective Expression as Applied to Robot-Assisted Victim Assessment,” *ACM/IEEE Human-Robot Interaction*, 2007. poster with paper in proceedings.
5. **Burke, J.L., Coovert, M., Murphy, R.R., Riley, J., and Rogers, E.**, “Human-robot factors: Robots in the workplace,” *Proceedings of the 50th Annual Meeting of the Human Factors and Ergonomics Society*, San Francisco, CA, October 2006.
6. **Kramer, J., and Murphy, R.R.**, “Endurance Testing for Safety, Security, and Rescue Robots,” *PERMIS 2006*, Gaithersburg, MD, Aug. 2006.
7. **Murphy, R., Vestgaarden, T., Huang, H., and Saigal, S.**, “Smart Lift/Shore Agents for Adaptive Shoring of Collapse Structures: A Feasibility Study.” *IEEE Workshop on Safety Security Rescue Robots*, Gaithersburg, MD, Aug. 2006.
8. **Craighead, J., Day, B., and Murphy, R.R.**, “Evaluation of Canesta’s range sensor technology for urban search and rescue and robot navigation,” *IEEE Workshop on Safety Security Rescue Robots*, Gaithersburg, MD, Aug. 2006.
9. **Murphy, R.R., Burke, J., and Stover, S.**, “Field Studies of Safety Security Rescue Technologies through Training and Response Activities,” *IEEE Workshop on Safety Security Rescue Robots*, Gaithersburg, MD, Aug. 2006.
10. **Murphy, R.R., Griffin, C., Stover, S., and Pratt, K.**, “Use of Micro Air Vehicles at Hurricane Katrina,” *IEEE Workshop on Safety Security Rescue Robots*, Gaithersburg, MD, Aug. 2006.
11. **R. Murphy**, “Fixed- and Rotary-Wing UAVs at Hurricane Katrina,” *2006 IEEE International Conference on Robotics and Automation*, Orlando, FL, May 15-19, 2006. (Refereed poster and video)
12. **Bethel, C., and Murphy, R.**, “Affective Expression in Appearance-Constrained Robots using Non-Facial and Non-Verbal Cues,” *ACM/IEEE Human Robot Interaction*, Salt Lake City, UT., 2006. (Refereed poster.)
13. **K. Pratt, R. R. Murphy, S. Stover, and C. Griffin**, “Requirements for Semi-Autonomous Flight in Miniature UAVs for Structural Inspection,” *AUVSI Unmanned Systems North America*, 2006.
14. **R. Murphy, E. Steimle, C. Cullins, K. Pratt, M. Hall, C. Griffin**, “Use of Unmanned Surface and Aerial Vehicles to Inspect Damage After Hurricane Wilma,” *AUVSI Unmanned Systems North America*, 2006.
15. **Murphy, R. and Stover, S.**, “Gaps Analysis for Rescue Robots,” *ANS 2006: Sharing Solutions for Emergencies and Hazardous Environments*, Salt Lake City, Utah, Jan, 2006.
16. **Murphy, R. and Stover, S.**, “Rescue Robot Performance at 2005 La Conchita Mudslides,” *ANS 2006: Sharing Solutions for Emergencies and Hazardous Environments*, Salt Lake City, Utah, Jan, 2006.
17. **Armitage, W., Labrador, M., Kalyadin, D., and Murphy, R.**, “Infrastructure Design for Monitoring of Hazardous Sites During Incidents,” *ANS 2006: Sharing Solutions for Emergencies and Hazardous Environments*, Salt Lake City, Utah, Jan, 2006.

18. **R.R. Murphy and J.L. Burke**, “Up from the Rubble: Lessons Learned about HRI from Search and Rescue,” *Proceedings of the 49th Annual Meetings of the Human Factors and Ergonomics Society*, Sept 26-30, 2005, Orlando (CD only).
19. **Riddle, D.R.; Murphy, R.R.; Burke, J.L.**; “Robot-assisted medical reachback: using shared visual information,” *ROMAN 2005. IEEE International Workshop on Robot and Human Interactive Communication*, 2005. Aug. 13 - 15 2005 Page(s):635 - 642.
20. **Doitsidis, L., Nelson, A., Valavanis, K.P.; Long, M.T.; Murphy, R.R.**; “Experimental validation of a MATLAB based control architecture for multiple robot outdoor navigation,” *Proceedings of the 2005 IEEE International Symposium on, Mediterrean Conference on Control and Automation*, 27-29 June 2005 Page(s):1499 - 1505
21. **Matt Long, Aaron Gage, Robin Murphy and Kimon Valavanis**, “Application of the Distributed Field Robot Architecture to a Simulated Demining Task”, *2005 IEEE International Conference on Robotics and Automation (ICRA)*, Barcelona, Spain, 18-22 April 2005 Page(s):3193 - 3200.
22. **Jennifer Carlson, Robin R. Murphy, Svetlana Christopher, Jennifer Casper**, “Conflict Metric as a Measure of Sensing Quality,” *2005 IEEE International Conference on Robotics and Automation (ICRA)*, Barcelona, Spain.18-22 April 2005 Page(s):2032 - 2039.
23. **Murphy, R., Stover, S., and Choset, H.**, “Lessons Learned on the Uses of Unmanned Vehicles from the 2004 Florida Hurricane Season,” *AUVSI Unmanned Systems North America*, Baltimore, MD, June 27-29, 2005.
24. **J. Carlson, R. Murphy, A. Nelson**, “Follow-up Analysis of Mobile Robot Failures,” to appear *2004 IEEE International Conference on Robotics and Automation (ICRA)*, Volume 5, 26 April-1 May 2004 Page(s):4987 - 4994 Vol.5.
25. **A. Gage, R. Murphy**, “Robust, Distributed Recruitment of Mobile Robots Using Emotions,” *2004 IEEE International Conference on Robotics and Automation (ICRA)* .
26. **Gage, A., Murphy, R.R.**, “Affective Recruitment of Distributed Heterogeneous Agents,” *Nineteenth National Conference on Artificial Intelligence (AAAI-04)*, 2004.
27. **Burke, J.L.; Murphy, R.R.**; “Human-robot interaction in USAR technical search: two heads are better than one,” *Robot and Human Interactive Communication, 2004. ROMAN 2004. 13th IEEE International Workshop on*, 20-22 Sept. 2004, Pages:307 - 312
28. **Murphy, R.R.; Riddle, D.; Rasmussen, E.**; “Robot-assisted medical reachback: a survey of how medical personnel expect to interact with rescue robots,” *Robot and Human Interactive Communication, 2004. ROMAN 2004. 13th IEEE International Workshop on*, 20-22 Sept. 2004 Pages:301 - 306.
29. **Zimmel, B.C.; Long, M.T.; Carlson, J.; Murphy, R.R.**; “Distributed error handling and HRI,” *2004 IEEE International Conference on Robotics and Automation*, Volume: 2 , April 26-May 1, 2004 Pages:1874 - 1881 Vol.2
30. **Carlson, J.; Murphy, R.R.; Nelson, A.**; “Follow-up analysis of mobile robot failures,” *proceedings, ICRA '04. 2004 IEEE International Conference on Robotics and Automation*, Volume: 5 , April 26-May 1, 2004, Pages:4987 - 4994

31. **Fincannon, T., Barnes, L., Murphy, R.R., and Riddle, D.R.**, "Evidence of the Need for Social Interaction in Rescue Robots," *IEEE International Conference on Intelligent Robots and Systems (IROS)*, Volume 1, 28 Sept.-2 Oct. 2004 Page(s):1089-1095, vol.2.
32. **Carlson, J. and Murphy, R.R.**, "An Investigation of MML Methods for Fault Diagnosis in Mobile Robots," *IEEE International Conference on Intelligent Robots and Systems (IROS)*, Volume 1, 28 Sept.-2 Oct. 2004 Page(s):180 - 186 vol.1.
33. **Burke, J.L., Murphy, R.R., Riddle, D.R. and Fincannon, T.**, "Task performance metrics in human-robot interaction: Taking a systems approach," *Performance Metrics for Intelligent Systems Workshop*, Gaithersburg, MD, 2004.
34. **Murphy, R., Shyy, W., Gonzales, N., Fitz-Coy, N., and Papila, N.**, "Remote Resupply Systems for Unmanned FCS-related Vehicles," Proc. SPIE Vol. 5083, Unmanned Ground Vehicle Technology V; Grant R. Gerhart, Charles M. Shoemaker, Douglas W. Gage; Eds., 2003, p. 285-302.
35. **Carlson, J., and Murphy, R.**, "Reliability Analysis of Mobile Robots," *ICRA 2003*, Vol1 , 2003 Pages:274-281.
36. **Casper, J., and Murphy, R.R.** "Workflow Study on Human-Robot Interaction in USAR," *ICRA 2002*, pp 1997-2003.(finalist for the Anton Phillips Best Student Paper Award)
37. **Murphy, R.R.**, "Marsupial Robots for Law Enforcement," *SPIE Law Enforcement Technologies*, Nov., 2000.
38. **Murphy, R.**, "Biomimetic Search for Urban Search and Rescue," *IROS 2000*, Takamatsu, Japan, Oct., 2000 vol. 3, pp. 2073-2078. *invited*
39. **Murphy, R., Casper, J., Hyams, J., Micire, M., and Minten, B.**, "Mobility and Sensing Demands in USAR," session on Rescue Engineering, *IECON-2K*, Oct. 25-28, Nagoya, Japan. pp. 138-142 vol.1. *invited*
40. **Minten, B., Hyams, J., and Murphy, R.** "A Communication-Free Behavior for Docking Multiple Robots," *Distributed Autonomous Robots (DARS) 2000*, Nov. 2000.
41. **Majchrzak, D., Sarkar, S., Sheppard, B., and Murphy, R.** "Motion Detection From Temporally Integrated Images," *ICPR 2000*, July, 2000.
42. **Gage, A., and Murphy, R.** "Sensor Allocation for Behavioral Sensor Fusion using Min-Conflict with Happiness," *IROS 2000*, Oct. 2000.
43. **Casper, J., and Murphy, R.R.**, "Issues in Intelligent Robots for Search and Rescue," *SPIE Ground Vehicle Technology II*, Orlando, FL, April, 2000.
44. **Hyams, J., Minten, B., Micire, M., and Murphy, R.R.**, "Vision-based docking under variable lighting conditions," *SPIE Ground Vehicle Technology II*, Orlando, FL, April, 2000.
45. **Hyams, J., Powell, M., and Murphy, R.R.**, "Position Estimation and Cooperative Navigation of Micro-rovers Using Color Segmentation," *1999 IEEE International Symposium on Computational Intelligence in Robotics and Automation (CIRA 99)*, Monterey, CA, Nov. 1999, pp. 195-201.

46. **Gage, A., and Murphy, R.R.**, “Allocating Sensor Resources to Multiple Behaviors,” *IROS 99*, Kyongju, South Korea, pp. 247–253.
47. **Spofford, J., Blicht, J., Klarquist, W., Murphy, R.**, “Vision-guided heterogeneous mobile robot docking,” *SPIE Conference on Sensor Fusion and Decentralized Control in Robotic Systems II*, Boston, MA, vol. 3839, Sept. 1999, pp 112-121.
48. **Murphy, R.**, “Summary of Panel Discussion,” proceedings *SPIE Unmanned Ground Vehicle Technology*, 7-8 April, 1999, Orlando, FL., vol. 3693, pp. 291-294.
49. **Robin R. Murphy, Michelle Ausmus, Magda Bugajska, Tanya Ellis, Tonia Johnson, Nia Kelley, Jodi Kiefer, Lisa Pollock**, “Marsupial-like Mobile Robot Societies,” *Agents 99*, Seattle, WA, May 1-5, 1999, pp. 364-365.
50. **Murphy, R.R., and Hershberger, D.**, “Classifying and Recovering from Sensing Failures in Autonomous Mobile Robots,” *Japan-USA Symposium on Flexible Automation (1998JUSFA)*, July 13-15, 1998, Ohtsu, Japan.
51. **Diaz, D., and Flowers, T., and Murphy, R. R.**, “Intelligent Exploration Strategy for the Find Life on Mars Competition,” *Robotics 98*, Albuquerque, NM.
52. **Murphy, R.R., and Rogers, E.**, “Intelligent Assistance for Human Supervisory Control of Multiple Robots,” *SPIE International Symposium on Aerospace: Robotic and Semi-Robotic Ground Vehicle Technology*, vol. 3366, April 13-17, 1998, Orlando, FL., pp. 52-60.
53. **Murphy, R. R., and Martinez, J.**, “Lessons Learned from the NSF REU Site Grant: Multiple Autonomous Mobile Robots for Search and Rescue Applications,” *Frontiers in Education 97*, Pittsburgh, PA, Nov.5-8, 1997.
54. **Rogers, E., Thompson, C., and Murphy, R. R.**, “Outbreak Agent: Intelligent Wearable Technology for Hazardous Environments,” *International Conference on Systems, Man and Cybernetics*, 1997, pp. 3198-3203. *invited*
55. **Murphy, R. R., Hawkins, D.K., and Schoppers, M.J.**, “Reactive Combination of Belief Over Time Using Direct Perception,” *IJCAI-97*, Nagoya, Japan, Aug. 23-29, 1997, pp.1353-1358.
56. **Murphy, R.R., Marzilli, A., and Hughes, K.**, “When to Explicitly Replan Paths for Autonomous Mobile Robots,” *1997 IEEE International Conference on Robotics and Automation*, April 22-24, 1997, Albuquerque, NM, vol. 4, pp.3519-3526.
57. **Rogers, E., Murphy, R.R., and Ericson, B.**, “Agent-Based Expert Assistance for Visual Problem Solving,” *Autonomous Agents 97*, Marina del Rey, CA, Feb. 5-8, 1997, pp. 156–163.

RESEARCH (past 10 years)

- **Pending Research**

NSF HCC-Medium, \$550,000, “The Social Medium is the Message, PI: R. Murphy, J. Burke, and Clifford Nass (Stanford), pending

Microsoft HRI, \$70,000, “Survivor Buddy: A Web-Enabled Robot as a Social Medium for Trapped Victims, PI: R. Murphy, J. Burke, and Clifford Nass (Stanford), pending

• **Funded Research (past 10 years)**

NSF CISE, \$100,000, 9/07-8/30/09, “CRI: IAD - A Pressing Need for Observation, Facilitation and Computer Support of Group Interactions for Advancing United States National Priorities–Homeland Security and Economic,” PIs: Feniosky Pena-Mora (University Illinois), Luis von Ahn (CMU), Noshir Contractor, Robin Murphy, David Forsyth

NSF CISE, \$26,320, 12/06-12/07, “Young HRI Researchers Workshop, PIs: R. Murphy, J. Burke

NSF SSR-RC, \$285,000 subaward, 9/06-6/30/08, “Analysis of viability and feasibility of current and emerging mining communication and mine rescue technologies for application in today’s mining environment,” **MSHA Mine Safety and Health Administration**, industry sponsor, PI, R. Murphy.

NSF SSR-RC, \$48,000 subaward, 9/1/06-8/1/07, “Micro-Imager for UAV Obstacle Avoidance,” **Tessera, Inc.**, industry sponsor, co-PIs, N. Ranganathan, R. Murphy

ARL, \$3,640,000 (\$549,662 subaward), 8/1/06-7/30/07, “Emerging Distributed Team Processes in Critical Environments,” PI: B. Goldiez (UCF), USF co-PIs: R. Murphy, J. Burke, M. Coovert, M. Brannick.

ONR, \$2,180,000 (\$350,000 subaward), 6/10/06-6/9/07, Coordinated Operation of Humans, Agents, and Unmanned Vehicles for Littoral Warfare,” PI: J. Bradshaw (IHMC), USF co-PIs: R. Murphy, E. Steimle, and D. Armitage

NSF CISE IIS, \$108,385, 6/22/06-12/30/07, “SGER: Human-MAV Team Processes for Effective Hurricane Response,” PI: R. Murphy, Co-PI: J. Burke, S. Stover.

NSF CISE IIS, \$21,600, 11/14/05-11/13/06, “Young HRI Researchers Workshop,” PI R. Murphy, Co-PI Jenny Burke.

NSF Engineering CMS, \$29,453, 9/27/05-9/26/06, “SGER: Hurricane Katrina- Documenting Damage to Multi-Story Commercial Structures along the Gulf Coast using Rotary-Wing Unmanned Aerial Vehicles,” PI: R. Murphy, Co-PIs: S. Stover.

CHI Systems/US Army SBIR Phase II, \$260,000, 8/05-2/07, “TAH-RI: Terrain Analysis for Human-Robot Interaction,” PI: Robin Murphy

Defense Threat Reduction Agency, Edgewood Chemical Biological Center, \$1,940,000, 12/05-7/08, “National Testbed for Rescue Robotics,” PI: Robin Murphy

Microsoft Research, University Relations, \$40,000, 12/04-11/05, “The Visible Robot: Curriculum Development Grant,” PI: Robin Murphy.

NSF SSR-RC and Florida High Tech Corridor, \$300,000, 10/04-9/06, “Workforce Enhancement for Safety, Security and Rescue Robotics Grant,” PI: Robin Murphy, Co-PI: Sam Stover

NSF Industry/University Cooperative Research Center, \$450,000, 8/15/2005-8/14/2010, “Safety, Security, and Rescue Robots,” PI: Robin R. Murphy, Co-PI: Richard Voyles (UMN).

ONR, \$600K, 01/2004-12/31/2005, “NAIMT,” PI: Kimon Valavanis, Co-PI: Robin R. Murphy.

ONR, \$975,686, 05/21/2003-07/31/2004, “NAIMT,” PI: Robin R. Murphy.

ONR, \$86,460, 1/02/2004-8/31-2004, “NAIMT: A Visual Environment for Design, Development, Testing and Evaluation of Aerial Vehicle Intergated Control and Diagnostics,” PI: Robin R. Murphy, Co-PI: Kimon Valavanis

NSF I/UCRC, \$10,000, 10/1/2003-9/30/2004, “Safety, Security, and Rescue Robots,” PI: Robin R. Murphy, Co-PI: Kimon Valavanis, Richard Voyles (UMN).

USF College of Engineering/Visual and Performing Arts Grant, \$20,000, “Videofish: TV Worth Watching,” PI: Robin R. Murphy, Co-PI: Hasan Elahi (VAPA), Bill Kearns (FMHI).

DARPA IPTO CSEE, \$180,000, 1/03-9/03, “Ethnographic Studies of RAP Teams Conducting Urban Search and Rescue,” PI: Robin R. Murphy.

ARO, \$10,000, 2/03-1/04, “Participation Grant for IEEE Robotics and Automation Society SSRR Workshop 2003,” PI: Robin R. Murphy.

NSF, \$1.2M, 10/02-6/08, CISE Distributed Research Resources, “R4: Robots for Rescue, Research and Response.” PI: Robin R. Murphy.

NSF, \$96,000, 9/02-8/03, CMS Small Exploratory Research Grant, “Adaptive Shoring for Rescue Robots.” (CMS-0229809) PI: Robin R. Murphy.

CDMHA, \$225,000, 11/01-12/02, “Robot-Assisted Search and Rescue.” PI: Robin R. Murphy.

Department of Energy, \$548,373, 9/01-8/04, “Distributed Cooperative Sensing for Active Diagnosis and Recovery.” (DE-FG02-01ER45904). PI: Robin R. Murphy.

ONR, \$50,000, 05/02-10/02, “Rescue Robots for Naval Research-Industry Partnerships.” PI: Robin R. Murphy.

ONR, \$246,000, 04/01/01-9/04, “Cooperation and Collaboration of Heterogeneous Agents with Sensing Uncertainty,” PI: Robin Murphy, formerly co-PI: Christine Lisetti, College of Business. (N00014-01-1-0409)

DARPA ITO Synergistic Cyber-Forces, \$42,717, 1/01/01-12/31/01, “Intelligent Systems Interaction in USAR.”

DARPA TTO FCS, \$239,922, 3/01/01-9/01/03, “Sensor Fault Detection and Recovery for the DARPA PerceptOR Program,” subcontract to SAIC.

DARPA TTO FCS, \$49,969, 1/01/01-9/01/01, “Marsupialism for the DARPA UGCV Program,” subcontract to SAIC.

DARPA ATO Tactical Mobile Robots, \$562,000, 9/99-12/02, “Robust Cooperative Navigation in Docking, Inspection and Surrogate Sensing,” PI: Robin R. Murphy.

DARPA TTO, \$200,000, 8/01/01-9/15/02, “A Study on Resupply for FCS-like Vehicles,” PI: Robin R. Murphy, co-PI: Wei Shyy (UFlorida), Noel

DARPA TTO FCS, \$49,969, 1/01/01-9/01/01, “Marsupialism for the DARPA UGCV Program,” subcontract to SAIC.

DARPA ATO Tactical Mobile Robots, \$562,000, 9/99-12/02, “Robust Cooperative Navigation in Docking, Inspection and Surrogate Sensing,” PI: Robin R. Murphy.

DARPA TTO, \$200,000, 8/01/01-9/15/02, “A Study on Resupply for FCS-like Vehicles,” PI: Robin R. Murphy, co-PI: Wei Shyy (UFlorida), Noel Gonzales (ETI).

ONR, \$7,000, “Dynamic Sensor Allocation Using Sensing Quality,” PI: Robin R. Murphy

NSF REU, \$123,748, 5/98-4/00, “Multiple Autonomous Mobile Robots for Search and Rescue Applications,” PI: Robin R. Murphy, Co-PI: Karen Tichenor.

Northrop Grumman Corporation, Military Aircraft Systems Division, 6/97-99, \$107,000, “Support of Robust UAV.”

NSF Research Experience for Undergraduates, 6/97-5/98, \$10,000, supplement to “Reactive Sensing for Autonomous Mobile Robots,” two undergraduates ATO Tactical Mobile Robots.

NSF CISE, 6/97-5/00, \$400,000, “Combined Research-Curriculum Development on Diagnostics, Health Assessment, and Predictive Maintenance of Engineered Processes and Systems,” PI: R. Shoureshi, co-Pi J. Gosink, B. Olds, R. Murphy, J. Steele.

NSF CISE Research Instrumentation, 5/1/97-4/30/98, \$119,996, “Intelligent Assistance for Multiple Robots,” PI: R. Murphy, E. Rogers (co-PI, Clark-Atlanta University).

National Park Service, Geological Resource Division, Oct1,1996-Sept.30,1998, \$35,000, “Computer Technical Assistance and Website Development for National Park Service Geological Resource Division.”

NSF REU Site Grant, AY97-98, \$134,600, “Multiple Autonomous Mobile Robots for Search and Rescue Applications,” PI: R. Murphy, co-PI: Julian Martinez, Director of Minority Engineering Program (co-PI).

NSF, co-funded with DARPA, May, 94– May, 98, \$210,000. “Reactive Sensing for Autonomous Mobile Robots.”

NASA SBIR Phase 2, AY94-98, subcontractor \$86,600. “Robotic Whole-body Dexterity and a Software Architecture for Robotic Task Performance in Uncontrolled Environments,” NASA Johnson Space Center, Houston, and Robotics Research Harvesting, Redwood City, CA.

- **Research: Patents**

- “Knowledge-Based Video Compression” Disclosure USF 006B83PR

- **Research: Student Advising**
Student Awards

- 2006 CSE Department Graduate Research Competition, 2nd Place PhD category: Matt Long.
- 2006 CSE Department Graduate Research Competition, 2nd Place MS category: Rod Gutierrez.
- 2002 IEEE RAS Anton Phillips Best Student Paper Award, Finalist: Jenn Casper.

National Science Foundation Fellows

- Cindy Bethel, current. Topic: Expression of Affect in Non-Anthropomorphic Robots. Expected: 6/08.

PhD Students (Current)

- Jeff Craighead, from University of South Florida, topic: Simulation of sensors for rapid training. Expected: 8/09.
- Brian Day, from Clarke College (Iowa), topic: space related robotics. Expected: 6/09
- Jennifer Carlson Gage, topic: Detecting sensing anomalies. Expected: 8/08.
- Rod Gutierrez, topic: affective control of robots. Undergrad: University of South Florida. *awarded 2nd place in 2006 CSE Department Graduate Research Competition, Master’s category.*
- Mayur Palankar, from New Mexico State University, topic: distributed teams. Expected: 6/09
- Kevin Pratt, from Principia College (Missouri), topic: Guarded motion for UAVs in disaster response. Expected: 6/08

PhD Students (Recent Graduates)

- Matt Long, from Colorado School of Mines, topic: Persona, roles, policies for representing capabilities of distributed robots, 5/07, thesis: “Breaking the Typecast: Revising Roles for Coordinating Mixed Teams.” Currently a researcher with Google, Trondheim, Norway.
- Jenny Burke, PhD in Industrial-Organization Psychology, co-advisor with Mike Coovert in Psychology, 5/06, thesis: “RSVP: An Investigation of the Effects of Remote Shared Visual Presence on Team Process and Performance in US&R Teams”, University of South Florida. Currently a research scientist at USF and head of the Human-Robot Interaction Laboratory.
- Aaron Gage, PhD in Computer Science and Engineering, advisor, 12/04, thesis: “Multi-Robot Task Allocation Using Affect,” University of South Florida. Currently head of software for Ocean Optics.

- Kevin Gifford, PhD in Aerospace Engineering, co-advisor with George Morganthaler in Aerospace Engineering at University of Colorado, 12/97, thesis: “Path Planning Strategies for Autonomous Ground Vehicles,” University of Colorado, Boulder (off campus co-advisor). Currently, a project manager with BioSERVE at University of Colorado.

Master’s Students (Current and Recent Graduates)

- Jeff Kramer, from University of Illinois Urbana-Champaign, topic: Reliability of robot systems. Expected: 6/10

MS Students (Recent Graduates)

- Kevin Pratt, 12/07, “Analysis of VTOL MAV Use During Rescue and Recovery Operations Following Hurricane Katrina,” topic: Guarded motion for UAVs in disaster response. Undergrad: Principia College (Missouri).
- Chris Williams, 7/06, thesis: “Self-Regulating Bandwidth Algorithm for Search and Rescue Robots,” supported by a NSF Safety Security Rescue Research industry/university cooperative research center grant. Undergrad: University of West Florida. *patent in process*.
- Burke, J. L. 7/03, thesis: “Moonlight in Miami: A field study of human-robot interaction in the context of an urban search and rescue disaster response training exercise,” Master’s thesis, University of South Florida, Tampa.
- Jenn Casper, 5/02, thesis: “Human-Robot Interactions at the World Trade Center,” supported by DARPA SCF Seedling Program. Undergrad: University of Wisconsin LaCrosse. Thesis nominated for USF Best MS Thesis.
- Jeff Hyams, 5/01, thesis: “Robust Vision-Based Perception for Docking,” supported by DARPA TMR. Undergrad: University of South Florida.
- Aaron Gage, 5/01, thesis: “Mobile Robot Sensor Allocation Using Min-Conflict with Happiness,” supported by ONR. Undergrad: Colorado School of Mines.
- Dale Hawkins, 1/98, thesis: “Persistence of Belief with Direct Perception,” supported by NSF/DARPA Grant. Undergrad: Colorado School of Mines.
- Dave Hershberger, 12/97, thesis: “Mobile Robot Sensor Fault Recovery Improvements,” supported by NSF/DARPA Grant. Undergrad: New Mexico Tech.
- John Blich, 4/96, thesis: “KNOBSAR: An Expert System Prototype for Robot Assisted Urban Search and Rescue,” supported by Army AI Center. Undergrad: West Point.

***Undergraduate Students (excluding REU site grants)**

• USF Honors College

- Rosemarie Yagoda, 2007, topic: human-robot interaction
- Michael Lindemuth, 2007, topic: marking robot state in Google Earth
- Albert Ng, 2006, topic: speech interface for robot-assisted medical intervention.

- **NSF/Computing Research Association Women Distributed Mentoring Program,**

- 2007 Jackie Schoeneker, Centre College, Kentucky
- 2004 Van Phu, New Jersey Institute of Technology, NJ.
- 1997 Pavani Reddy, Hunter College, NY.
- 1996 Alisa Marzilli, Emory University, Atlanta.
- 1995 Eva Noll, Lasalle University, Philadelphia.

- **McNair Scholars Program**

- Roberto Montane, research project: “Coaching for Autonomous Mobile Robots,”2000-2001.

TEACHING (past 10 years)

Course	Credits	Date (past 5 years)
University of South Florida, Computer Sciences and Engineering		
<i>CIS4930: Introduction to AI</i>	3	S04
<i>CIS4930: Videofish</i> †	3	F03
<i>CIS4930/6930: Robots, Agents, People</i> †	3	S03
<i>CIS6930: Advanced AI Robotics</i> †	3	S01
<i>CIS6930: Introduction to Homeland Security Technology</i> †	3	S05,S06
<i>CIS4660/6930: Intro to AI Robotics</i> †	3	F98,F99,F00,F02,F04,F05,F06
<i>CIS6930: Autonomous Agents</i> †	3	S00
<i>CIS4250: Computing Ethics</i>	3	S99,S00,S01

†created course

GOVERNMENT SERVICE (past 10 years)

- **State and National Service**

- ***State and National Program Reviews and Panels**

- 2006: Member, National Science Foundation, Blue Ribbon Panel on Science of Design program.
- 2006: presenter, National Science Board, workshop on hurricane science.

- ***State and National Boards and Study Groups**

- 2007-2009: Member, National Academies/National Research Council study on Air and Ground Vehicles.
- 2006-2008: Member, National Science Foundation CISE Advisory Board.
- 2006-2007: Chair, Research, Development, Education and Workforce Enhancement Committee,Space Florida Board of Directors. Gubernatorial appointment (Jeb Bush).
- 2005-2007: Member, National Academies/National Research Council study on Critical Information Technologies for Disaster Management.

- 2001-2002: Member, National Academies/National Research Council study on Unmanned Ground Vehicles.
- 1998-1998: Member, White House study: Structure for Laboratory for National Information Infrastructure, with G. Orsak (Southern Methodist), M. Hill (Wisconsin).
- **Defense Service**
 - ***Defense Program Reviews and Panels**
 - 2006: Member, DoD DUSD(S&T) Ground and Sea Platform Technology Area Review and Assessment.
 - 2004: Member, DoD DUSD(S&T) Air Platforms FY2004 Technology Area Review and Assessment.
 - 1998: ONR External Panel Review, Naval Research Laboratory: Integrated Autonomous Systems area.
 - ***Defense Boards and Study Groups**
 - 2004-2007: Member, DARPA Information Science and Technology Study Group.
 - 2002-current: Member, USMC Chemical Biological Incident Response Force (CBIRF) Technical Advisory Panel
 - 2001-5: member, United States Air Force Scientific Advisory Board
 - 1998 to 1999: Defense Science Study Group, Institute for Defense Analyses, DARPA.
 - 1999-2000: Member, DARPA Technical Advisory Board for MSTAR program
 - 1998-1999: Member, DARPA Technical Advisory Board for Micro Air Vehicle program.
- **Emergency Response Service**

Technical search specialist, Florida Task Force 3 regional urban search and rescue team. Team leader, CRASAR robot-assisted USAR response team which has participated in:

 - Crandall Canyon Utah mine disaster (2007)
 - Newmont Midas Utah Gold Mine incident (2007), first use of robots for vertically-directed mine rescue
 - Hurricane Wilma (2005), first use of unmanned surface vehicles for search and rescue
 - Hurricane Katrina (2005), first use of small unmanned aerial vehicles for search and rescue
 - Hurricane Dennis (2005)
 - Hurricane Charley (2004)
 - La Conchita, California, mudslide (2005)
 - World Trade Center(2001), first use of unmanned ground robots for search and rescue

PROFESSIONAL ACTIVITIES AND SERVICE (past 10 years)

• Membership in Professional Societies

American Association for Artificial Intelligence (AAAI)
Association for Computing Machinery (ACM)
Association for Unmanned Vehicle Systems International (AUVSI)
Florida Fire Chiefs' Association
Institute of Electrical and Electronics Engineers (IEEE)
Society of Photo-Optical Instrumentation Engineers (SPIE)
Society of Women Engineers (SWE)

• Editorial Service

- **Associate Editor**, *IEEE Intelligent Systems*, 2000-current.
- **Associate Editor**, *Robotics and Autonomous Systems* journal, 1997-current.
- **Guest Editor**, *IEEE Systems, Man and Cybernetics Part B*, with Erika Rogers, special issue "Human-Robot Interaction," Vol.34, No.2, May 2004. *This issue codified the newly emerging field of human-robot interaction and reproduced the DARPA/NSF study on HRI co-chaired by Rogers and Murphy.*
Co-guest edited (Erkmen, A.M.; Tsubouchi) a special issue on Mechatronics education, *Robotics and Automation Magazine*, June 2001.
Guest edited a special issue on Robots and education, Intelligent Systems and Their Applications, Nov-Dec 2000.

• IEEE Robotics and Automation Society

Elected member of Administrative Committee, 2005-current.
Society Parliamentarian, 2004-current.
Co-founder and co-chair of Safety, Security, and Rescue Robotics technical committee, 2001-2005.
Secretary, Executive Committee, 2000-2002. *First woman to serve on executive committee.*
Co-chair (Americas) of the Education Committee, 1998-1999.

• Program Committees

*Chair

NSF Young HRI Researchers Workshop, 2006 and 2007, co-chaired with Jenny Burke and Cory Kidd.

First IEEE Robotics and Automation Society Workshop on Safety, Security, and Rescue Robotics, General Chair 2003.

IEEE International Conference on Robotics and Automation, Tutorial Chair, 2004.

DARPA Workshop on Biological Inspirations for Micro Air Vehicles, Co-chaired, April 21-22, 1999.

1999 AAAI Mobile Robotics Competition and Exhibition, Chair, Madison, WI, 1999.

*Member, Program Committees

IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 2007), international program committee Jeju, Korea, August 26 to 29, 2007.

ACM/IEEE International Conference on Human-Robot Interaction, senior program committee 2007, 2008

Intelligent Autonomous Vehicles (IAV 2004), program committee Lisbon, Portugal, 5-7 July 2004.
IEEE Robotics and Automation Society Workshop on Safety, Security, and Rescue Robotics, 2004, 5, 6, 7.
IEEE International Conference on Robotics and Automation, 1997, 2000, 2004 (Tutorial Chair).
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 1994, 2003, 2004, 2007.
AAAI National Conference on AI, Orlando, FL, July, 1997-9.
International Conference on Autonomous Agents, 1998.
SPIE OE/Technology Symposium, Sensor Fusion, 1994-2000.
SPIE Robotic and Semi-Robotic Ground Vehicle Technology, now **SPIE Unmanned Vehicle Technology**, part of SPIE's International Symposium on Aerospace, 1998- current
IEEE/SICE/RSJ International Conference on Multisensor Fusion and Integration, 1994, 6.
International Dedicated Conference on Robotics, Motion and Machine Vision, 1994-5.
OE/Aerospace Science and Sensing, Intelligent Information Systems, Applications of Artificial Intelligence XI: Machine Vision and Robotics, Orlando, FL, Apr., 1993.

- **Panel Organization**

1. **2006 Human Factors and Ergonomics Society**, "Human-Robot Interaction: Robots in the Workplace."
2. **2005 Society of Industrial Organizational Psychologists**, "Robots in the Workplace."
3. **2001 SPIE Aerosense Unmanned Ground Vehicle Technologies III**, "FCS and Everything Else."
4. **2002 SPIE Aerosense Unmanned Ground Vehicle Technologies IV**, "Robots at the World Trade Center."
5. **2001 SPIE Aerosense Unmanned Ground Vehicle Technologies II**, "The View from Government on UGVs."
6. **2000 SPIE Aerosense Unmanned Ground Vehicle Technologies II**, "Advanced Technologies for Unmanned Ground Vehicles."
7. **2000 SPIE Aerosense Unmanned Ground Vehicle Technologies**, "Future UGV Applications."

- **Robot Competition Organization**

- **2002 AAI/RoboCup Rescue– Physical Agent League**, Edmondton, CA, Aug, 2001,
- **2001 RoboCup Rescue– Physical Agent League**, Seattle, WA, Aug, 2001, RoboCup organizing committee.
- **1998 AAI Mobile Robotics Competition**, Madison, WI, July, 1998, general competition Chair.
- **1998 International Conference on Autonomous Agents Robot Exhibition**, Minneapolis, MN, May, 1998, chair.
- **1997 AAI Mobile Robotics Competition**, Providence, RI, July, 1997. Chair, Fund Raising, and member, Rules Committee.

- **Referee Work for Journals, Conferences, and Agencies**

IEEE Transactions on Robotics and Automation, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Knowledge and Data Engineering, IEEE Expert, International Journal of Pattern Recognition and Artificial Intelligence, Robotics and Autonomous Systems, Autonomous Robots, Journal of Experimental and Theoretical Artificial Intelligence, IEEE Robotics and Automation Society Magazine, IEEE Control Society Magazine, Machine Vision and Applications

DEPARTMENT AND INSTITUTIONAL SERVICE (past 10 years)

- **USF**

- **Director, NSF Industry/University Cooperative Research Center**, 2003-2006. This position is the equivalent of a 0.25 administrative load which is absorbed through grant funding.

- **Dean College of Engineering Search Committee**, member, 2002.

- **Department of Computer Science and Engineering**

- **Faculty Search Committee**, member, 2003-current.

- **Long Range Planning Committee**, member, 1998-current. (*this committee goes by various names*)

- **Promotion and Tenure Committee**, member, 1998-current.

PUBLIC OUTREACH(past 10 years)

- **Invited Presentations to Scientific, Industrial, and Defense Communities**

- **Civilian Applications of Unmanned Aerial Systems**, invited presentation “Safety Security Rescue UAS in 10 Years, Boulder, CO., Oct. 2, 2007

- **Kansas UAS Symposium**, invited presentation UAS Lesson from Rescue Robots, Salinas, KS, Oct. 4, 2007

- **US Army Robotics IPT Workshop**, invited presentation, HRI Lessons from Rescue Robots, Ft. Belvoir, MD, Dec. 12, 2007.

- **IEEE Workshop on Safety Security Rescue Robotics**, keynote talk, “Preliminary Report on use of Robot at Crandall Canyon Utah Mine Disaster, Rome, Italy, Sept. 26, 2007.

- **Moffitt Cancer Center Researcher Appreciation Day**, keynote talk, They REALLY Are Coming for You: Rescue Robots, Jun 14, 2007.

- **CRA-W Mentoring Workshop**, keynote talk, The 50 Worst Things You Can Do in Your Career, San Diego, June 9, 2007.

- **ASME Tampa Bay chapter**, invited presentation, Rescue Robots at USF, May 9, 2007

- **Ohio State Cognitive Engineering Laboratory**, invited presentation, Rescue Robotics, March 6, 2007.

- **Unmanned Capabilities Conference**, invited speaker, Why Robots Arent Being Adopted, Nashville, TN, Jan 23, 2007.
- **Vanderbilt Computer Science colloquia**, invited talk, HRI and Rescue Robotics, Vanderbilt, Nashville, TN, Jan 22, 2007.
- **International Conference on Automation, Robotics and Computer Vision**, keynote speaker, “Rescue Robotics: A Grand Challenge,” Singapore, Dec. 5, 2006.
- **DARPA Integrated Learning Workshop**, keynote speaker, ”Emergency Response and Integrated Learning: Who, What, Where, When, Why, and How,” Detroit, MI, Jun 20, 2006.
- **Department of Homeland Security Critical Incident Technologies Conference**, invited presentation, “Review of Unmanned Systems and Communications,” Sep 6, 2006. *Presentations are limited to speakers from federal or state agencies; Dr. Murphy is the only university professor who presents due to her field work.*
- **RoboBusiness**, invited talk, “Safety Security Rescue Robots:ff Public Sector Needs and Wants,” Boston, MA, May 10, 2005.
- **Saxena Lecture Series, USF-Lakeland**, “Up From the Rubble: Lessons Learned with Rescue Robots,” Lakeland, Florida, Mar 29, 2005.
- **Department of Homeland Security Fellows Program**, keynote luncheon address, “Up from the Rubble,” Washington, DC, Nov, 2004.
- **Carnegie Mellon Robotics Institute 25th Anniversary: Robots and Thought**, keynote talk, “Up from the Rubble,” Oct. 13, 2004. *Dr. Murphy was one of seven researchers invited to speak on grand challenges.*
- **NSF**, CISE Distinguished Lecture, “Robot-Assisted Search and Rescue from 9/11 to Now: Where’s the IT?” Nov. 11, 2002. *This lecture is given by scientists of the highest caliber and has been compared to the Turing Award lectures for NSF.*
- **Carnegie Mellon Univeristy WomanSCS Distinguished Lecture**, “Robot-Assisted Search and Rescue,” CMU, Oct. 24, 2002. *This was the first lecture.*
- **ONR Naval Industry-Research Partnership Conference**, luncheon speaker, “Robot-Assisted Search and Rescue: Why Industry-Research Partnerships are Needed,” Washington, DC, Aug. 13, 2002. *Introduced by Adm. Jay Cohen, chief of ONR.*
- **Innovative Applications of Artificial Intelligence 2002**, invited speaker, “Robot-Assisted Search and Rescue at the WTC: Where’s the AI?,” Edmonton, CA, Aug. 2, 2002.
- **NSF**, invited speaker, “Robot-Assisted Urban Search and Rescue at the WTC,” Washington, DC, Feb. 19, 2002.
- **SGI Forum on Rescue and Crisis Management**, “Robot-Assisted Search and Rescue at the WTC: Where’s the IT?,” Tokoyo, Japan, Sept. 26, 2002. *This was a closed forum to the top managers in SGI Japan.*

- **CVPR 2001**, invited speaker, “Robot-Assisted Urban Search and Rescue at the WTC,” Kauai, Hawaii, Dec. 13, 2001.
- **ISATED Intelligent Systems and Control Conference**, keynote speaker, “Robot-Assisted Urban Search and Rescue at the WTC,” Clearwater, FL, Nov. 19, 2001.
- **Perceptual User Interfaces Workshop**, keynote speaker, “Robot-Assisted Urban Search and Rescue at the WTC,” Orlando, FL, Nov. 16, 2001.
- **International Disaster and Emergency Response Conference**, “Robot-Assisted Urban Search and Rescue at the WTC,” The Hague, Oct. 25, 2001.
- **National Institute for Urban Search and Rescue (NIUSR) Conference**, “Robot-Assisted Urban Search and Rescue at the WTC,” Huntsville, AL, Sept. 26, 2001.
- **National Institute for Urban Search and Rescue (NIUSR)**, invited speaker, “Magic Machines in these Wondrous Times,” with LTC John Blich, Jan. 22, 2001.
- **2000 DARPA Workshop on PalmPower**, invited speaker, “Issues with Power for Mobile Robots,” Ft. Lauderdale, FL, Nov, 2000.
- **1997 IEEE Computer Society Workshop on Undergraduate Education and Image-Related Computation**, invited speaker, “Image computation in an upper-level elective on robotics,” San Juan, PR, June, 1997.
- **Murphy, R.R., 1997.** “Intelligent Sensor Fusion,” *ProTem-CC/NSF Joint Workshop on Intelligent Robotic Agents*, Porto Alegre, Brazil, Mar. 17-19, 1997.
- **Murphy, R.R., 1997.** “Robotic Learning: A Shift in Paradigms,” keynote talk, *10th International Florida Artificial Intelligence Research Conference*, May 11-14, 1997.

- **Museums, General Public**

Museum of Science and Industry, Tampa, FL, loan of rescue robot equipment and assistance with the *Disasterville* permanent exhibit, beginning in 2006.

Denver Museum of Science and Nature, Denver, CO, “Robots to the Rescue,” keynote talk as part of their Engineering exhibit series. 11/20/06

The Robot Zoo, an ongoing traveling exhibition developed by the University of Minnesota under funding from NSF in 2003 and has been shown through out the US and France. Provided expert assistance and videos. 2003.

- **International and National Media Appearances (excludes local and state coverage)**

- **Crandall Canyon Mine Disaster, Aug 2007:** participated in two televised press conferences as robotic expert. Coverage by CNN (robot at mine was top story on web for 3 days), NY Times, Washington Post, St. Pete Times, and other major media.
- **Sago Mine Disaster, Jan 2006:** guest on *CNN Paula Zahn, Fox News, MSNBC Denise Crosby*
- **Hurricane Katrina, Sept-Dec 2005:** *CNN Headline News, CNN web* top article in technology section, *Popular Science, CNN* follow up covering NSF funded research, *Fox News*

- **World Trade Center:** *CNN*, Sept 15, 2001, *NPR*, Sept 16, 2001, *NBC Today Show*, Sept 18, 2001, *New York Times*, Sep 24, 2001
- **General:**
 - **History Channel**, Tactical to Practical, 2005. (still in rotation)
 - **TIME Magazine**, Innovators in Artificial Intelligence, Jul, 2004. 1/2 page photo and story
 - **Fox News** segment on triage sensor for robots, Oct 14, 2004.
 - **Discover Science Channel**, Technowledge segment on Center for Robot-Assisted Search and Rescue, March 2004 (still in rotation)
 - **BBC Techno Games**, segment on Center for Robot-Assisted Search and Rescue, first aired Mar 19, 2003.
 - **Good Morning America**, segment on rescue robot field exercise in Connecticut, 2002.
 - **BBC Wild Ideas Series**, Marsupial Robots, 2000.
 - **Washington Post**, Marsupial Robot Duty: Rescue in Pockets of Rubble, July 5, 1999.