Curriculum Vitae

Brian P. Gerkey

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Artificial Intelligence Laboratory
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RESEARCH INTERESTS

multi-robot coordination • distributed algorithms • distributed & embedded systems • robot programming & simulation

EDUCATION

PhD, Computer Science, University of Southern California, August 2003. Dissertation advisor: Prof. Maja J Matarić. Dissertation: *On Multi-Robot Task Allocation*.

M.S., Computer Science, University of Southern California, May 2000.

B.S.E., Computer Engineering, magna cum laude, departmental honors, Tulane University, May 1998. Thesis advisor: Prof. James S. Jennings. Honors thesis: *Task Allocation for Heterogeneous Robots*. Secondary major in Mathematics. Minor in Robotics & Automation.

PROFESSIONAL

From Aug 2003 : *Postdoctoral Scholar*, Stanford University Artificial Intelligence Laboratory. Advisor: Prof. Sebastian Thrun.

Jun 2003 – Jul 2003: *Postdoctoral Research Fellow*, University of Southern California Robotics Research Laboratory. Advisor: Prof. Maja J Matarić.

Aug 1998 – May 2003: *Research Assistant*, University of Southern California Robotics Research Laboratory. Advisor: Prof. Maja J Matarić.

Feb 2002 – Feb 2003: *Consultant*, Evolution Robotics, Inc., Pasadena, California. Supervisor: Dr. Paolo Pirjanian.

Jun 2001 – Jul 2001: *Consultant*, University of Southern California Information Sciences Institute. Supervisor: Dr. Kristina Lerman.

Feb 2001 – Mar 2001: *Consultant*, Phoenix International, Fargo, North Dakota. Supervisor: Dr. Noel W. Anderson.

May 1999 – Aug 1999: *Member of Technical Staff*, Artificial Intelligence Group, Jet Propulsion Laboratory, Pasadena, California. Supervisor: Dr. Tara Estlin.

Nov 1996 – May 1998: *Research Assistant*, Tulane University Mobile Robot Laboratory. Advisor: Prof. James S. Jennings.

May 1996 – Aug 1998: *Programmer*, Computerized Processes Unlimited, Inc., Metairie, Louisiana. Supervisor: Thomas J. Accardo.

HONORS

Intel Foundation Graduate Fellowship	2001–2002
Tau Beta Pi Honor Society	1997–present
Upsilon Pi Epsilon Honor Society	1996–1998
Tulane Engineering and Computer Science Honor Society	1995–1998
Tulane University Dean's Honor Scholarship	1994–1998
Lockheed Leadership Fund Scholarship	1994–1998
Dixie Crows Scholarship	1994–1998
National Merit Scholar	1994
Georgia Scholar	1993–1994
Georgia Governor's Honor Program	1993

SERVICE

Program Committees

Intl. Conf. on Advanced Robotics (ICAR), Seattle, Washington, 2005
Natl. Conf. on Artificial Intelligence (AAAI), Pittsburgh, Pennsylvania, 2005
Robotics: Sciences and Systems, Cambridge, Massachusetts, 2005

Reviewing

Journals: Autonomous Robots • Computational Geometry – Theory and Applications • Journal of Artificial Intelligence Research • Journal of Autonomous Agents and Multi-Agent Systems • IEEE Transactions on Robotics • IEEE Transactions on Robotics and Automation • IEEE Transactions on Systems, Man, and Cybernetics - Part B

Conferences: Natl. Conf. on Artificial Intelligence (AAAI) • Intl. Conf. on Advanced Robotics (ICAR) • Intl. Conf. on Autonomous Agents • Intl. Conf. on Intelligent Autonomous Systems (IAS) • Intl. Joint Conf. on Artificial Intelligence (IJCAI) • IEEE Intl. Conf. on Robotics and Automation (ICRA) • IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)

COMMUNITY SOFTWARE

Founding and lead developer on Player, part of the Player/Stage/Gazebo project. Player is a language- and platform-independent robot device interface, which supports a wide variety of robots, peripherals, and algorithms. Stage and Gazebo are sensor-based multiple robot simulators, to which Player is also the interface. Player, Stage, and Gazebo are Free Software, released under the GNU General Public License, and they enjoy a significant and burgeoning user community. Software from this project has been downloaded over 20,000 times, is actively used in major academic, government, and industrial research labs around the world, and is also used in teaching undergraduate and graduate classes. In June 2002, we received approximately $100,000 in funding for development of Player and Stage via a supplement to DARPA grant DABT63-99-1-0015, "A Software Framework for Reliable, Adaptive, Autonomous Robots (MARS)." The software is available from:

`http://playerstage.sourceforge.net`

PUBLICATIONS

Refereed Journal Articles

Brian P. Gerkey and Maja J Matarić. A formal analysis and taxonomy of task allocation in multi-robot systems. *Intl. Journal of Robotics Research* 23(9):939–954, Sep 2004. Also Technical Report CRES-03-013.

Brian P. Gerkey and Maja J Matarić. Sold!: Auction methods for multi-robot coordination. *IEEE Transactions on Robotics and Automation*, special issue on Multi Robot Systems, 18(5):758–768, Oct 2002. Also Technical Report IRIS-01-399.

Refereed Conference Papers

Brian P. Gerkey, Sebastian Thrun, and Geoff Gordon. Visibility-based pursuit-evasion with limited field of view. In *Proc. of the Natl. Conf. on Artificial Intelligence (AAAI 2004)*, pages 20–27, San Jose, California, July 25 - 29, 2004.

Richard T. Vaughan, **Brian P. Gerkey**, and Andrew Howard, On device abstractions for portable, reusable robot code. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, pages 2121–2427, Las Vegas, Nevada, October 2003. Also Technical Report CRES-03-009.

Brian P. Gerkey and Maja J Matarić. Multi-Robot Task Allocation: Analyzing the Complexity and Optimality of Key Architectures. In *Proc. of the IEEE Intl. Conf. on Robotics and Automation (ICRA)*, pages 3862–3868, Taipei, Taiwan, September 2003. Also Technical Report CRES-02-005.

Brian P. Gerkey, Richard T. Vaughan, and Andrew Howard. The Player/Stage Project: Tools for Multi-Robot and Distributed Sensor Systems. In *Proc. of the Intl. Conf. on Advanced Robotics (ICAR)*, pages 317–323, Coimbra, Portugal, June 2003.

Brian P. Gerkey, Maja J Matarić, and Gaurav S Sukhatme. Exploiting physical dynamics for concurrent control of a mobile robot. In *Proc. of the IEEE Intl. Conf. on Robotics and Automation (ICRA)*, pages 3467–3472, Washington D.C., May 2002.

Brian P. Gerkey and Maja J Matarić. Pusher-watcher: An approach to fault-tolerant tightly-coupled robot coordination. In *Proc. of the IEEE Intl. Conf. on Robotics and Automation (ICRA)*, pages 464–469, Washington D.C., May 2002. Also Technical Report IRIS-01-403.

Brian P. Gerkey, Richard T. Vaughan, Kasper Støy, Andrew Howard, Gaurav S Sukhtame, and Maja J Matarić. Most Valuable Player: A Robot Device Server for Distributed Control. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, pages 1226–1231, Wailea, Hawaii, October 2001.

Brian P. Gerkey and Maja J Matarić. Principled communication for dynamic multi-robot task allocation. In D. Rus and S. Singh, editors, *Experimental Robotics VII, LNCIS 271*, pages 353–362. Springer-Verlag Berlin Heidelberg, 2001. Presented at the Intl. Symp. on Experimental Robotics (ISER), Waikiki, Hawaii, December 2000.

Refereed Conference Posters

Brian P. Gerkey and Maja J Matarić. Murdoch: Publish/Subscribe Task Allocation for Heterogeneous Agents. In *Proc. of Autonomous Agents*, pages 203–204, Barcelona, Spain, June 2000.

Refereed Workshop Papers

Brian P. Gerkey, Sebastian Thrun, and Geoff Gordon. Parallel stochastic hill-climbing with small teams. To appear in A.C. Schultz et al., editors, *Multi-Robot Systems: From Swarms to Intelligent Automata, Volume III* Kluwer Academic Publishers, the Netherlands, 2005.

Brian P. Gerkey and Maja J Matarić. A Framework for Studying Multi-Robot Task Allocation. In A.C. Schultz et al., editors, *Multi-Robot Systems: From Swarms to Intelligent Automata, Volume II*, pages 15–26, Kluwer Academic Publishers, the Netherlands, 2003. Presented at the Intl. Workshop on Multi-Robot Systems, Washinton, DC, May 2003.

Brian P. Gerkey, Richard T. Vaughan, Kasper Støy, Andrew Howard, Gaurav S Sukhtame, and Maja J Matarić. Most valuable player: A robot device server for distributed control. In *Proceedings of the Second Intl. Workshop on Infrastructure for Agents, MAS, and Scalable MAS at Autonomous Agents 2001*, Montreal, Canada, May 2001.

Invited Papers

Chris Jones, Dylan Shell, Maja J Matarić, and **Brian P. Gerkey**. Principled Approaches to the Design of Multi-Robot Systems. In *Proceedings of the Workshop on Networked Robotics, IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Sendai, Japan, September 2004.

Brian P. Gerkey and Maja J Matarić. On role allocation in RoboCup. In Daniel Polani, Andrea Bonarini, Brett Browning, and Kazuo Yoshida, editors, *RoboCup 2003: Robot Soccer World Cup VII, LNCS 3020*, pages 43–53, Springer-Verlag Berlin Heidelberg, 2004.

Technical Reports (not otherwise published)

Ashley Tews, Maja J Matarić, Gaurav S Sukhatme, and **Brian P. Gerkey**. "G'day Mate. Let me Introduce you to Everyone: An Infrastructure for Scalable Human-System Interaction". Technical Report CRES-02-004, Center for Robotics and Embedded Systems, School of Engineering, University of Southern California, September 2002.

Brian P. Gerkey, Kasper Støy, and Richard T. Vaughan. "Player robot server". Technical Report IRIS-00-392, Institute for Robotics and Intelligent Systems, School of Engineering, University of Southern California, November 2000.

Unrefereed Workshop/Symposia Papers

Brian P. Gerkey and Maja J Matarić. Are (explicit) multi-robot coordination and multi-agent coordination really so different? In *Proc. of the AAAI Spring Symp. on Bridging the Multi-Agent and Multi-Robotic Research Gap*, pages 1–3, Palo Alto, California, March 2004.

Brian P. Gerkey and Maja J Matarić. A market-based formulation of sensor-actuator network coordination. In *Proc. of the AAAI Spring Symp. on Intelligent Embedded and Distributed Systems*, pages 21–26, Palo Alto, California, March 2002.

Dissertation / Thesis

Brian P. Gerkey. On Multi-Robot Task Allocation. PhD dissertation, Computer Science Department, Univ. of Southern California, Los Angeles, California, August 2003. Also Technical Report CRES-03-012.

Brian P. Gerkey. Task Allocation for Heterogeneous Robots. Undergraduate honors thesis, Department of Electrical Engineering and Computer Science, Tulane Univ., New Orleans, Louisiana, May 1998.

INVITED TALKS (excluding conference paper talks)

"Sensing and acting under uncertainty: An overview of work in the Stanford Robot Learning Lab," KAIST-Stanford Technology Workshop on Intelligent Robot Systems, Korean Advanced Institute of Science and Technology, Daejeon, Republic of Korea, December 2004.

"Clear the building: Pursuit-evasion with teams of robots," Colloquium talk, Computer Science Dept., Washington University, St. Louis, Missouri, November 2004.

"The Player/Stage/Gazebo Project: Open Source tools for robotics research," Colloquium talk, Computer Science Dept., Univ. of Nevada, Reno, Nevada, October 2004.

"Pursuit-Evasion with Limited Field of View," Artificial Intelligence Center, SRI International, Menlo Park, California, May 2004.

"A Formal Analysis of Multi-Robot Task Allocation," Computer Science Dept., Univ. of California, Santa Cruz, California, November 2003.

"Player/Stage/Gazebo: Open Source tools for research in multi-robot systems," DARPA Workshop on Navigation, Locomotion, and Articulation, Washington, DC, November 2003.

"The Player/Stage Project: Making Good Free Software for Robotics Research," Guest lecture, Computer Science Dept. / Intelligent Systems Laboratory, Univ. of New Orleans, Louisiana, April 2003.

"Player & Stage: Current Status and Future Directions," DARPA Software for Distributed Robotics (SDR) Principal Investigators Meeting, Washington, DC, March 2003.

"Analyzing Multi-Robot Task Allocation," Information Sciences Laboratory, HRL Labs, Malibu, California, October 2002.

"Task Allocation in Multi-Robot Systems," Colloquium talk, Computer Science Dept., Harvey Mudd College, Claremont, California, October 2002.

"Player & Stage: Robot Device Interface & Multiple Robot Simulator," for the DARPA Information Processing Technology Office, at the DARPATech Symposium, Anaheim, California, July 2002.

"Player & Stage: Robot Device Interface & Multiple Robot Simulator," in the Robot Exhibition at Autonomous Agents, Montreal, Canada, May 2001.

PERSONAL

Citizenship: USA