

Brian Yamauchi

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www.robotfrontier.com

Education

- **Ph.D. Computer Science (1995) — Case Western Reserve University**
- **M.S. Computer Science (1990) — University of Rochester**
- **B.S. Applied Math / Computer Science (1988) — Carnegie Mellon University**

Professional Experience

- **Technical Director — Anki (San Francisco, CA)**
March 2018 - Present
- **Principal Robotics Engineer (Software) — iRobot Corporation (Bedford, MA)**
July 2012 – February 2018: Designed and developed robust outdoor navigation and behavior-based control software for an autonomous consumer robot.
- **Lead Robotacist — iRobot Corporation (Bedford, MA)**
March 2003 – June 2012: Invented robotic concepts, conducted applied R&D, and developed software for autonomous robots. Principal Investigator for DoD-funded research projects with total value of \$3.9 million. PI for the Army-funded Wayfarer Project, which developed outdoor navigation and mapping software for the PackBot using stereo vision, LIDAR, and GPS/INS. Developed GPS/INS-based navigation and obstacle avoidance software for driving autonomous vehicles on urban streets, as part of the DARPA Urban Challenge.
- **Senior Software Engineer — iRobot Corporation (Burlington, MA)**
January 1999 – February 2003: Developed a sonar-based mapping and navigation system for the iRobot-LE commercial Internet telepresence robot. Developed a LIDAR-based mapping and navigation system for an autonomous industrial floor-cleaning robot.
- **Research Associate — Naval Research Laboratory (Washington, DC)**
August 1996 - December 1998: Developed frontier-based exploration algorithm to enable mobile robots to autonomously explore and map unknown environments. Frontier-based exploration has since been applied by researchers at many different institutions to allow robots to explore a variety of environments.
- **Postdoctoral Fellow — Institute for the Study of Learning and Expertise (ISLE) (Palo Alto, CA)**
August 1995 - July 1996: Developed robust methods for robot spatial learning and place recognition in dynamic environments using sonar-based occupancy grids.
- **Robotics Engineer — NASA Kennedy Space Center (Cape Canaveral, FL)**
January 1992 - July 1992: Developed control software for a robot manipulator arm designed to inspect radiator panels on the space shuttle using sonar and vision.

- **Member of the Technical Staff — Jet Propulsion Laboratory (Pasadena, CA)**

Summer 1991: Designed navigation software for Rocky III, a six-wheeled Mars rover prototype. Later versions of the Rocky rovers were used as prototypes for the Sojourner rover used in the Mars Pathfinder mission.

Programming Languages / Operating Systems _____

- C (20+ years), C++ (20+ years), Python (9 years)
- Linux/Unix (20+ years), ROS (2 years)

Patents _____

- 7,539,557 B2, *Autonomous Mobile Robot*
- 8,244,469 B2, *Collaborative Engagement for Target Identification and Tracking*
- 8,527,113 B2, *Remote Vehicle*
- 8,577,538 B2, *Method and System for Controlling a Remote Vehicle*
- 9,135,554, *Robot Controller Learning System*
- 9,420,741 B2, *Robot Lawnmower Mapping*
- 9,516,806 B2, *Robotic Lawn Mowing Boundary Determination*
- 9,538,702 B2, *Robotic Mowing of Separated Lawn Areas*

Selected Publications _____

- "Beyond Rosey: Consumer Robots in the 21st Century" (book chapter), in *Autonomous Technologies: Applications that Matter*, William Messner, ed., Warrendale, PA: SAE International, 2014
- "A Frontier-Based Approach for Autonomous Exploration," *Proceedings of the 1997 IEEE International Symposium on Computational Intelligence in Robotics and Automation*, July 1997
- "Mobile Robot Exploration and Map-Building with Continuous Localization," *Proceedings of the 1998 IEEE International Conference on Robotics and Automation (ICRA 98)*, May 1998
- "Frontier-Based Exploration Using Multiple Robots," *Journal of Robotics and Autonomous Systems*, Vol. 29, No. 2-3, November 1999