

DARRIN C. BENTIVEGNA

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Nationality: US
Security Clearance: TS/SBI

Experience

Carnegie Mellon University, Kyoto, Pittsburgh, PA

Postdoctoral Fellow, January 2005-Present

- Developing software and control algorithms for a newly designed humanoid robot.
- Conducting testing on the robot to accurately model its performance.
- Evaluating the performance of the robot and suggesting upgrades and improvements.
- Exploring various methods for humanoid robots to learn motor skills.

ATR Computational Neuroscience Laboratories, Kyoto, Japan

Visiting Researcher, January 1998-Present

- Providing consulting services to Honda research in Wako, Japan to assist their personnel develop dynamic skills for humanoid robots.
- Performing research on methods to give robots the ability to learn tasks from observing others.
- Designed a method that uses various numerical learning techniques, such as locally weighted learning and reinforcement learning, to allow the robots to increase their performance through practice.
- Developed a three level framework that structures research in learning from observation using primitives.
- Created robotic systems as testbeds for conducting learning from observation research.
- Designed and implemented intelligent motor control algorithms for controlling a 30 degree-of-freedom humanoid robot and other specially built robots to perform dynamic tasks.
- Assisted in the creation of a fast and intelligent vision system that accurately observes the location and movements of objects in the environment.
- Developed various simulation environments using OpenGL and OpenInventor in which to test learning algorithms.

Georgia Institute of Technology, Atlanta GA

Research Assistant, November 1995-May 1998

- Assisted in the design and construction of an Unmanned Ground Vehicle (UGV) funded by DARPA.
- Installed actuators and controllers for the steering, throttle and brake pedal and created schematic, wiring and block diagrams, and operating instructions.
- Developed software in C and C++ for the control and testing of the actuators and implemented a system that allowed the UGV to be controlled via a serial line.
- Performed research in controlling mobile robots through the use of hand signals.
- Created an intelligent vision system that keeps the signaling person in the field-of-view of the robot mounted camera while the robot moves around the environment.
- Designed a system of signals and recognition algorithms to communicate the desired movement to the robot.

Harris Corporation, Palm Bay, FL

Pre-Professional Intern, June 1997-October 1997

- Created automated test scripts for a vehicle dispatching program developed with Power Builder. The scripts were produced with Visual Test and SQA Robot.

Dynetics Inc., Huntsville, AL

Systems Analyst II, June 1996-October 1996 and June 1998-October 1998

- Developed terrain representation utilities in C++ for Environmental Effects for Distributed Interactive Simulations (E2DIS) for use by the Defense Intelligence Agency - Missile and Space Intelligence Center.
- Created a graphical environment, using OpenGL and Tcl/TK, that is used as a visual presentation and evaluation tool for missile testing events.

United States Navy

Electronic Material Division Leading Chief Petty Officer, January 1991-September 1995

- Supervised and assisted personnel in the operation, testing and maintenance of electronic equipment and various inertial and non-inertial navigation systems to be used onboard fleet ballistic missile submarines.

Submarine Navigation Electronic Technician, January 1990-January 1991

- Operated and maintained the ship's electronic navigation, radar and surveillance measures equipment.

Platform/Laboratory Instructor, May 1986-December 1989

- Taught basic electricity and electronics including the areas of series/parallel circuits through transistor theory, and inertial navigation basics.

Education

Georgia Institute of Technology *September 1995-July 2004*

Degree: **Ph.D., Computer Science (Intelligent Systems)** GPA: **3.8**

Florida Institute of technology *June 1993-August 1995*

Degree: **Master of Science, Space Systems, minored in Computer Science** GPA: **3.85**

Valdosta State University *January 1983-August 1985*

Degree: **Bachelor of Science, Education** GPA: **3.81** Honors: **Magna Cum Laude**

Publications

Modulation of simple sinusoidal patterns by a coupled oscillator model for biped walking, Jun Morimoto, Gen Endo, Jun Nakanishi, Sang-Ho Hyon, Gordon Cheng, Darrin Bentivegna, and Christopher G. Atkeson, ICRA 2006

Learning to Act from Observation and Practice, Darrin C. Bentivegna, Ales Ude, Christopher G. Atkeson, and Gordon Cheng. International Journal of Humanoid Robotics, Volume 1, Number 4, December 2004.

Learning from Observation and Practice using Primitives, Darrin C. Bentivegna, Christopher G. Atkeson, and Gordon Cheng. AAAI Fall Symposium Series, Symposium on "Real-life Reinforcement Learning", October 22-24, 2004.

Learning Tasks From Observation and Practice, Darrin C. Bentivegna, Christopher G. Atkeson, and Gordon Cheng. Special issue on "Robot Learning by Demonstration" of Elsevier's Robotics and Autonomous Journal, 47 (2004), pages 163-169.

A Framework for Learning From Observation using Primitives, Darrin C. Bentivegna, Christopher G. Atkeson, and Gordon Cheng. Journal of Robotics Society of Japan, Vol. 22, No. 2, 2004, pages 28-33.

Learning from Observation and from Practice using Behavioral Primitives, Darrin C. Bentivegna, Christopher G. Gordon Cheng, and Atkeson. 11th International Symposium of Robotics Research. October 19-22, 2003.

Learning to Select Primitives and Generate Sub-goals From Practice, Darrin C. Bentivegna, Christopher G. Atkeson, and Gordon Cheng. IROS 2003, October, 2003.

Learning from Observation and Practice at the Action Generation Level, Darrin C. Bentivegna, Christopher G. Atkeson, and Gordon Cheng. Humanoids 2003, October, 2003.

Humanoid Robot Learning and Game Playing Using PC-Based Vision, Darrin C. Bentivegna, Ales Ude, Christopher G. Atkeson, and Gordon Cheng. IROS 2002, Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland, October, 2002.

Learning How to Behave from Observing Others, Darrin C. Bentivegna and Christopher G. Atkeson. SAB'02-Workshop on Motor Control in Humans and Robots: on the interplay of real brains and artificial devices, Edinburgh, UK, August, 2002.

A Framework for Learning from Observation Using Primitives, Darrin C. Bentivegna and Christopher G. Atkeson. Symposium of Robocup 2002, Fukuoka, Japan, June, 2002.

Learning From Observation Using Primitives, Darrin C. Bentivegna and Christopher G. Atkeson. ICRA 2001, Seoul, Korea, May 2001.

Using Primitives in Learning from Observation, Darrin C. Bentivegna and Christopher G. Atkeson. Humanoids 2000, Boston, Mass. September 2000.

Testbeds Used for Exploring Learning from Observation, Darrin C. Bentivegna and Christopher G. Atkeson. Published in the proceedings of the workshop for the AAAI2000 Robot Competition and Exhibition.

Using Primitives in Learning from Observation: A Preliminary Report, Darrin C. Bentivegna and Christopher G. Atkeson. Published in the proceedings of the workshop of the Eighth AAAI Mobile Robot Competition and Exhibition held at AAAI99.

Design and Implementation of a Teleautonomous Hummer, Darrin C. Bentivegna, Khaled S. Ali, Ronald C. Arkin, and Tucker Balch. Mobile Robots XII in Pittsburgh Pennsylvania, October 1997.