Curriculum Vitae

Garth J. Zeglin

Business Address:
Robotics Institute
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Personal information

Born: January 30, 1970 in Ivrea, Italy.

Research Interests

Legged locomotion; minimalist robotics; passively stable dynamic mechanisms.

Education

Ph.D., Robotics, 1999.
Carnegie Mellon University Robotics Institute, Pittsburgh, PA.
Dissertation: *The Bow Leg Hopping Robot*.
Advised by Professor Matthew Mason and H. Benjamin Brown.

B.S., Mechanical Engineering, 1991.
Massachusetts Institute Of Technology, Cambridge, MA.
Undergraduate thesis advised by Professor Marc Raibert titled
Uniroo: A One Legged Dynamic Hopping Robot.

Employment

January 2002–present. Robotics Institute, Carnegie Mellon University.
Project Scientist with Prof. Christopher Atkeson. Designed and developed a second highly compliant bipedal walking robot. Continued development of minimalist walking control. Developed dynamic simulation software for design evaluation and controller optimization. Supervised undergraduate students and mentored graduate students.

January 2001–January 2002. Robotics Institute, Carnegie Mellon University.
Post-doctoral fellow with Prof. Jessica Hodgins and Prof. Christopher Atkeson. Designed and developed our first bipedal walking robot motivated by passive-dynamic principles. Responsible for all aspects: locomotion controller development, mechanical design, real-time software architecture, and sensor electronics design.

January 2000–July 2000. Robotics Institute, Carnegie Mellon University.
Post-doctoral fellow with Prof. Illah Nourbakhsh and the Toy Robots Initiative. Designed the first version of the 3D Bow Leg hopping robot. Supervised student development of a prototype aerial robot suspended on strings.

January 1993–August 1993. Boston Dynamics, Inc., Cambridge, MA.
Simulation software engineer. Developed dynamic simulations of mechanical systems for commercial clients, and contributed to software infrastructure.

January 1992–December 1992. Bolton Engineering, Inc., Melrose, MA.
Electrical, mechanical, and software design engineer for commercial product development.

Summer, 1991. MIT Artificial Intelligence Laboratory.
Research staff under Prof. Chris Atkeson.

Summer, 1990. MIT Artificial Intelligence Laboratory.
Research staff under Prof. Marc Raibert.

Summer, 1989. MIT Media Lab.
Research staff under Prof. Barry Vercoe.

Summer, 1988. MIT Physics Department.
Research staff under Prof. David Pritchard.

Summer, 1986 and 1987. Pearse and Associates, Bethesda, MD.
Electrical design engineer.

Teaching Experience

Summer, 2001. Andrew's Leap.
Co-taught a robotics section for a summer program for advanced high school students with Prof. Matt Mason.

Spring, 2001. Telepresence Art and Applications.
Co-taught a new course in telepresence art with artist Peter Coppin.

Summer, 1995. Andrew's Leap.
Teaching assistant.

Spring, 1995. Laboratory Course in Robotics Manipulation.
Teaching assistant for a new course; helped define curriculum.

Publications

Papers at Refereed Conferences

Mike Stilman, Chris Atkeson, James Kuffner, and Garth Zeglin. "Dynamic programming in reduced dimensional spaces: Dynamic planning for robust biped locomotion." In Proceedings of IEEE International Conference on Robotics and Automation, 2005.

Jun Morimoto, Jun Nakanishi, Gen Endo, Gordon Cheng, Christopher G. Atkeson, and Garth Zeglin. "Poincaré-map-based reinforcement learning for biped walking." In Proceedings of IEEE International Conference on Robotics and Automation, 2005.

Roger B. Dannenberg, Ben Brown, Garth Zeglin, and Ron Lupish. "McBlare: A robotic bagpipe player." To appear in International Conference on New Interfaces for Musical Expression, Vancouver, Canada, May 26-28 2005.

Jun Morimoto, Jun Nakanishi, Gen Endo, Gordon Cheng, Christopher G. Atkeson, and Garth Zeglin. "Acquisition of a biped walking pattern using an approximate Poincaré map". In IEEE-RAS/RSJ Int. Conf. on Humanoid Robots (Humanoids 2004)/Proceeding CD, November 2004.

Jun Morimoto, Gordon Cheng, Christopher G. Atkeson, and Garth Zeglin. "A simple reinforcement learning algorithm for biped walking." In Proceedings of IEEE International Conference on Robotics and Automation, pages 3030-5, April 2004.

Jun Morimoto, Garth Zeglin, and Christopher G. Atkeson. "Minimax differential dynamic programming: Application to a biped walking robot." In IEEE/RSJ International Workshop on Intelligent Robots and Systems, 2003.

Roger B. Dannenberg, Barbara Bernstein, Garth Zeglin, and Tom Neuendorffer. "Sound synthesis from video, wearable lights, and "The Watercourse Way". In Proceedings of The Eighth Biennial Symposium on Arts and Technology, pages 38-44, New London, Connecticut College, February 2003.

Zeglin, G., H.B. Brown Jr. "First hops of the 3D Bow Leg." 5th International Conference on Climbing and Walking Robots, 2002.

Brown, H.B., Zeglin, G.J. "The Bow Leg Hopping Robot." IEEE International Conference on Robotics and Automation, 1998.

Zeglin, G.J., Brown, H.B. "Control of a Bow Leg Hopping Robot." IEEE International Conference on Robotics and Automation, 1998.

Other Publications

H. Benjamin Brown Jr., Illah R. Nourbakhsh, and Garth John Zeglin. "Energy storage device used in locomotion machine." U.S. Patent 6,558,297. Issued May 6, 2003.

H. Benjamin Brown, Garth Zeglin, and Illah Nourbakhsh. "Resilient Leg Design for Hopping, Running, and Walking Machines." U.S. Patent Application 09/569,641, filed May 12, 2000.

Zeglin, G.J. 1999. "The Bow Leg Hopping Robot." Ph.D. thesis, Carnegie Mellon University. CMU-RI-TR-99-33.

Zeglin, G.J. 1991. "Uniroo: A One Legged Dynamic Hopping Robot." B.S. thesis, MIT Dept. of Mechanical Engineering.

Other Talks

October, 1999. Department of Energy Fellows Symposium.

Fellowships

1996-1999. U.S. Department of Energy Integrated Manufacturing Predoctoral Fellowship.

1993-1996. National Science Foundation Graduate Fellowship.

Art Activities

2003-present. "PS." Collaboration with Gretchen Skogerson to create sculpture that tells secrets. Our first piece is a mirror that solicits passersby by saying "psst," and then whispers a secret when they come close. Shown at "Collision Collective #7" April 1-10, 2005. Shown at the "Boston Cyberarts Festival" April 22-May 8, 2005.

2004. "McBlare." Collaboration with Roger Dannenberg and Ben Brown to develop a computer-controlled bagpipe player.

2002-2003. "Watercourse Way." Collaboration with Roger Dannenberg, Barbara Bernstein and Tom Neuendorffer. Developed radio-controlled illuminated costumes integrated with a contemporary music performance, performed July 26, 2003 with the Pittsburgh New Music Ensemble.

2003. "Glowing Hands," FLUX 10. Solo performance at arts festival. Developed technology and street theater performance based on gestural control of light embodied within the gloves of a costume. Performed June 6, 2003.

2003. Technical advisor to artist Anat Pollack.

2000-2002. "Light Dances." Collaboration with choreographer Mary Miller, costume designer Venise St. Pierre, lighting designer Adam Koe Leong. Developed self-contained illuminated dance costumes with algorithmic light patterns that respond to the movement of the dancers. Performed Apr. 12-13, 2002 at the Kelly Strayhorn theater, and Feb. 12, 2003 at the Byham Theater.

Spring 2001. Robotics consultant for the Critical Art Ensemble "Genterra" project. Participated in first performance June 2-3, 2001, at le Magasin Centre National d'Art Contemporain, Grenoble, France.

Spring 2001. Robotics consultant to artist Beatriz da Costa for the kinetic sculpture "Cello."

September 2000. Invited participant in the "Alma De Rana" art festival in Santomera, Spain. Collaborated on the performance piece "Institute for the Study of Biological Enigmas."

July-August 2000. Technical advisor to artist Heidi Kumao for the kinetic sculpture "Lullaby."

Personal Interests

Play trumpet; studied from 1994–2001 with Anthony Pasquarelli of the Carnegie Mellon Music Department.