Galen (Clark) Haynes

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Objective

Seeking a research position within the fields of robotics and computer science. Specific interests include algorithmic approaches for hybrid control, topology for robotics, dynamic systems, legged locomotion, and mobile robotics.

1 Education

May 2008	**Carnegie Mellon University**, *Pittsburgh, PA* Ph.D. in Robotics Thesis Advisor: Dr. Alfred A. Rizzi Topic: Gait Regulation Control Techniques for Robust Legged Locomotion
August 2002	**The University of Michigan**, *Ann Arbor, MI* B.S.E. in Computer Engineering (*magna cum laude*)

2 Research Experience

2002–2008 — **Carnegie Mellon University**, *Pittsburgh, PA*
Graduate Research Assistant, Microdynamic Systems Lab

Thesis research, 2004–2008: Developing an approach to control legged robots using the temporal space of gaits. Introduced methods to safely switch between, or to maintain, robot gaits in presence of task-level sensor feedback. Designed various feedback robot behaviors, using developed approach for control.

RiSE Project, 2003–2008: Team member of a multi-university DARPA-funded research project developing a dynamic legged climbing robot. Primary developer of robot climbing behaviors, including infrastructure and real-time control software. Other responsibilities have included software engineering, designing simulation infrastructure, incorporation and modeling of robot sensors, interfacing robot hardware, and robot maintenance.

RHex Project, 2002-2004: Developed a computer vision software architecture for a dynamic legged robot, as well as designed a high-speed motion capture system. Studied the use of gaits and gait transitions to enable enhanced mobility.

2000–2002 — **The University of Michigan**, *Ann Arbor, MI*
Undergraduate Research Assistant, Artificial Intelligence Lab
Assisted in robotics research projects, including work with camera calibration, visual servoing, hand-eye calibration of robot arm, and integrated camera systems for an autonomous legged robot.

3 Publications

3.1 Journals

G. C. Haynes, A. A. Rizzi, and D. E. Koditschek. Topology-Based Navigation of Phase Space: An Application to Legged Robot Gaits. (*in preparation*)

M. A. Spenko, **G. C. Haynes**, A. Saunders, A. A. Rizzi, M. Cutkosky, R. J. Full, D. E. Koditschek. Biologically Inspired Climbing with a Hexapedal Robot. *Journal of Field Robotics* (*to appear, April 2008*)

3.2 Conference Proceedings

G. C. Haynes and A. A. Rizzi. Gait Regulation and Feedback on a Robotic Climbing Hexapod. *Proceedings of Robotics: Science and Systems* (August 2006) pp. 97-104

A. A. Rizzi, **G. C. Haynes**, D. E. Koditschek, and R. J. Full. Gait Generation and Control in a Climbing Hexapod Robot. *SPIE Unmanned Systems Technology VIII* (June 2006)

G. C. Haynes and A. A. Rizzi. Gaits and Gait Transitions for Legged Robots. *Proceedings of the IEEE International Conference on Robotics and Automation* (May 2006)

4 Invited Talks (non-conference)

February 2008	Invited Talk, **Boston Dynamics, Inc.**, *Waltham, MA* (*scheduled*)
February 2008	Invited Talk, **Willow Garage, Inc.**, *Menlo Park, CA* (*scheduled*)
February 2008	GRASP Lab Special Seminar, **University of Pennsylvania**, *Philadelphia, PA*
September 2007	Autonomous Systems Robotics Seminar, **CSIRO ICT Centre**, *Brisbane, Australia*
March 2007	Foundations of Robotics Seminar, **The Robotics Institute**, *Pittsburgh, PA*
March 2006	Foundations of Robotics Seminar, **The Robotics Institute**, *Pittsburgh, PA*
March 2005	Foundations of Robotics Seminar, **The Robotics Institute**, *Pittsburgh, PA*
May 2004	Foundations of Robotics Seminar, **The Robotics Institute**, *Pittsburgh, PA*

5 Teaching Experience

Spring 2005	The Robotics Institute, **Carnegie Mellon University**, *Pittsburgh, PA* Teaching Assistant, *Kinematics, Dynamic Systems, and Control* Designed and graded problem sets, taught occasional lectures, and held offices for a class of 30 graduate-level students.
Ph.D. Research Committee Member	Hanns Tappeiner, Amir Degani
M.S. Thesis Committee Member	Vinithra Varadharajan (May 2007), Allan Luders (May 2007), Kevin Oishi (May 2006), David Silver (May 2005)

6 Coursework

Graduate **CMU**	Robot Kinematics and Dynamics, Controls (Linear, Nonlinear, and Embedded), Sensors and Sensing, Computer Vision, Artificial Intelligence for Robotics, Subterranean Robotics, Applied Mathematics for Robotics, Real Analysis
Undergraduate **U-M**	Artificial Intelligence (Theoretical and Applied), Operating Systems, Computer Graphics, Natural Language Processing, Cognitive Psychology, Psychology of Language

7   Awards and Scholarships

2002, 2003	National Science Foundation Graduate Research Fellowship, *Honorable Mention*
2002	U-M EECS Department Student Achievement Award
1998–2002	U-M College of Engineering Dean's List
1998–2002	U-M Angell Scholar
1998	U-M Regents Alumni Scholarship
1998	National Merit Finalist
	Eta Kappa Nu, Tau Beta Pi Honor Societies

8   Industrial Experience

2006, 2007, 2008	**Boston Dynamics, Inc.**, *Waltham, MA* Visiting Graduate Student Researcher Assisted with research activities and behavior prototyping for robotic research platforms.
2007	**Bossa Nova Concepts, Inc.**, *Pittsburgh, PA* Technical Consultant Adapted research code and algorithms for use on a microcontroller-based robotic toy platform, assisting with development of robot gaits and behaviors for robot prototypes.

9   Professional Activities

2007	Reviewer, *Journal of Field Robotics*
2006	Reviewer, *International Journal of Robotics Research*
2004	Reviewer, *IEEE/RSJ International Conference on Intelligent Robots and Systems*

10   Skills and Qualifications

Programming Languages	C/C++ software development (with focus on control architectures for real-time robotic applications), Python, Matlab, as primary development languages. Other experience includes C#, Perl, PHP, Lisp, Prolog.
Application Experience	Experience using GNU development tools (GCC, GDB, Make), Matlab, Mathematica, LaTeX, and Apache. Additional experience building software using SciPy (numerical computing), Matplotlib (scientific plotting library), OpenGL (3D graphics), Cairo (2D drawing), and Django (web framework).

11   General Information

Date of Birth	26 June 1979
Citizenship	United States (born in *Akron, OH*)

12 References

Available upon request.