Randolph C. Voorhies

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Education

Ph.D. in Computer Science
In Progress
University of Southern California
GPA: 3.930

M.S. in Computer Science - Intelligent Robotics
August 2009
University of Southern California
GPA: 3.910

B.S. in Computer Engineering & Computer Science
December 2006
University of Southern California
GPA: 3.497

Technical Skills

Programming Languages
C++ (11) · C · Python · MATLAB · Javascript · Perl · Spin

Software Libraries
Boost · ZeroC Ice · Eigen · OpenCV · ROS · Qt · Thrust · Arduino

Electrical Engineering Tools
Altium Designer · Cadsoft Eagle · Surface Mount Assembly

Engineering Abilities
Image Processing · Robotic Perception & Localization · Distributed Systems · Circuit Board Design

Experience

USC Computer Science Department
Fall 2007 - Present
Graduate Research Assistant in Laurent Itti's iLab
- Currently working on vision and point cloud perception systems for the DARPA Humanoid Robotics competition.
- Implemented NRT, a C++ modular programming framework for distributed image processing and robotics.
- Implemented tracking and object recognition systems for DARPA's Neovision2 project.
- Implemented a distributed attention system for DARPA's Cognitive Technologies Threat Warning System (CT2WS) project.
- Performed circuit design, assembly, and embedded programming for Beobot2.0, iLab's next generation 16-core mobile robot.

NASA / Jet Propulsion Laboratory
Summer 2012
Intern in the Computer Vision for Surface Applications Group
- Tuned and optimized a vision based monocular stabilization system for use in a quadrotor.
- Built an extensible framework for managing JPL's fleet of quadrotors in ROS.
- Ported a Rapidly Exploring Random Tree path planner for use on the quadrotors.
- Wrote an efficient Alpha/Beta filter to integrate and smooth quadrotor velocity and IMU data.

South Pasadena Educational Foundation
Summers 2007 - 2011
Teacher Trainer
- Designed a robotics curriculum to be taught to middle school students.
- Provided weekly training sessions for teachers.

USC Computer Science Department
Fall 2007 - 2009
CS445 Introduction to Robotics Lab Assistant
- Designed and taught curricula for weekly three-hour lab sessions.
- Designed and built a custom robotics controller board based on a 600Mhz Overo processor.
- Built a software architecture and library to help the students cross-compile and upload code, as well as libraries for motion control, data acquisition, image processing, and communication.

Microsoft
Summer 2004
Intern in the Security Division
- Developed security database migration tools in C#.

Publications

Neuromorphic Bayesian Surprise for Far-Range Event Detection
(Winner of the Best Student Paper Award)
R.C. Voorhies, L. Elazary, L. Itti

Proc. IEEE International Conference on Advanced Video and Signal Surveillance (AVSS) 2012

Centralized Server Environment for Educational Robotics
R.C. Voorhies, C. Siagian, L. Elazary, L. Itti
Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2009

Application of a Bottom-Up Visual Surprise Model for Event Detection in Dynamic Natural Scenes
R.C. Voorhies, L. Elazary, L. Itti
Vision Science Society Annual Meeting (VSS) 2010

Beobot 2.0: Cluster Architecture for Mobile Robotics
C. Siagian, C. Chang, R.C. Voorhies, L. Itti
Journal of Field Robotics (JFR) 2010

Honors

Member Phi Kappa Phi · Co-Chair of the "Education Robotics" session for IROS 2009