Benjamin Reinhardt

Innovation, Intensity, and Tenacity for robotics, augmented reality, and reprogrammable hardware
http://benjaminreinhardt.com | reinhardt@alumni.caltech.edu | 513.703.3332

EDUCATION

CORNELL UNIVERSITY
PhD Mechanical Engineering, Computer Science Minor
Expected May 2015 | Ithaca, NY
Focus: Space Robotics
NASA Space Technology Research Fellow
Lester B. Knight Fellow

CALTECH
BS Mechanical Engineering and History
2010 | Pasadena, CA
GPA 3.7

LINKS

Github:// bzreinhardt
LinkedIn:// benjaminzreinhardt
YouTube:// SeigeEngineer
Twitter:// @ben_reinhardt
Quora:// Benjamin-Reinhardt

TECHNOLOGY XP

ATOMLAND
• Embedded hardware • Sensor Fusion • Machine Tools • 3D Printers • Motor Controllers

BITLAND
•MATLAB • Python • C • Solidworks •Point Cloud Library • C++ • HTML • ROS • Java (Rusty)

PROJECTS

•SLAM, PF, and RRT control on a Roomba
•Amphibious Robots
•Two Story Trojan Horse
•Choreographed lightsaber battles
•Restarted elevator-riding tradition
•Kinect-based robot grasp detector
•Trebuchets
Ditch Day Adventure Hunt:
• Auto-collapsing concrete wall •Reverse geocache box •12-ft ice climbing wall • Electric clue-Palantir • Light-connection maze

EXPERIENCE

NASA AMES | Guest Scientist, Intelligent Robotics Group
Summer 2014 | Mountain View, CA
- Designed and fabricated a prototype robotic inspector to demonstrate new actuators.
- Demonstrated actuator operation on a low-friction air table.
- Updated a visual tracking system to include wireless hardware-in-the-loop control.

Summer 2013 | Mountain View, CA
Controls engineer building a room-sized 6-DOF microgravity simulator
- Designed and implemented controller that translated force inputs to accurate zero-g dynamics
- Implemented a learning algorithm to run automated tests that adjusted the system model and tuned gains

NASA JPL | Technology Research Fellow, Robotics Group
Summer 2012 | Pasadena, CA
- Created and simulated new control algorithms for an induction-based spacecraft actuator.
- Designed and built experiment to characterize eddy-current forces for actuation.

AEROVIRONMENT INC. | Research Initiative Intern
Summer 2009 | Monrovia, CA
- Built a photovoltaic rig for powering aquatic robots. Tested the rig in a fish tank and the open ocean.
- Built a model of wind flow over large buildings from experimental data.
- Ran thermal tests on UAV components.

VIRTUAL LUNG PROJECT | Research Assistant
Summer 2008 | UNC Chapel Hill
- Developed simulations of cilia-driven fluid flow in the lungs.

RESEARCH

CORNELL SPACE SYSTEMS DESIGN STUDIO | Graduate Student + Lab Manager
Summer 2010 – Present | Ithaca, NY
Induction-based Locomotion for Orbital Robotics
- Built a probabilistic design/controller generation algorithm that outperformed the human baseline.
- Developed simulation framework and visualizer for electromagnetic spacecraft actuators.
- Built fast algorithms to calculate eddy-current forces for dynamic actuation.
- Mentored year-long masters projects and senior projects.
- Rebuilt lab website for modernity and mobile friendliness.

PUBLICATIONS

Please see http://benjaminreinhardt.com/pages/papers/