Benjamin Shih

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Education

University of California, San Diego — San Diego, CA
Ph.D. Mechanical and Aerospace Engineering — August 2015 - present
MicroMBA, Rady School of Management — June 2016 - July 2016

Carnegie Mellon University — Pittsburgh, PA
M.S. Electrical and Computer Engineering — August 2013 - December 2013
B.S. Electrical and Computer Engineering — August 2009 - May 2013

Skills

Software: MATLAB, Eagle, SolidWorks, LaTeX, Git, Cadence, ProTools
Electronics: PCB design, microcontrollers, circuit simulation, soldering, oscilloscope, function generator, multimeter
Coding: C++, Python, Java, C, HTML
Languages: English (proficient), Mandarin Chinese (speaking), Spanish (basic)

Experiences

Bioinspired Robotics and Design Lab, UC San Diego — San Diego, California
Graduate Research Assistant — September 2015 - present

- Soft robotics and sensing, pneumatic actuation, computer vision, human-robot interaction, virtual reality.
- Advised by: Prof. Michael Tolley

Momentum Machines — San Francisco, California
Embedded Software Engineering Intern — May 2015 - August 2015

- Food technology startup using robotics and automation to produce gourmet food.
- Lead engineer for PCB fabrication of 6 unique boards with a design firm.
- Statecharts (finite state machine) software architecture for embedded control. Used a web-based graphical user interface to facilitate rapid prototyping and fast system bringup.
- Advised by: Jeff Jensen, Ali Rathore.

Reconfigurable Robotics Lab, EPFL — Lausanne, Switzerland
Research Assistant, École Polytechnique Fédérale de Lausanne — May 2014 - April 2015

- Built untethered, locomotive robot using soft pneumatic actuators (SPAs).
- Experimented with actuator frames to improve actuation consistency.
- Automated SPA testing using computer vision.
- Advised by: Prof. Jamie Paik, Dr. Juan Manuel Florez.

MIT Lincoln Laboratory — Lexington, MA
Graduate Intern — May 2013 - August 2013

- Worked with mechanical engineer to equip plane with visible spectrum vision capabilities.
- Created user interface using Qt for streaming video from camera and toggling individual frame recording.
- Designed software architecture using UML diagrams to describe how camera interacts with system.
- Team: Adith Subramanian. Advised by: Dr. Jon Watson, Dr. Seth Trotz, Dr. Jim Truitt.

NanoJapan, Rice University — Houston, TX
Undergraduate Researcher — May 2011 - August 2011

- Analyzed vibrational and rotational modes of C_{60} nanocars via Raman spectroscopy.
- Delivered poster presentation at International Symposium on Terahertz Nanoscience (TeraNano) at Osaka University, Japan in November 2011.
- Worked in cross-cultural research setting alongside $\sim$40 Japanese graduate students.
- Advised by: Prof. Kevin Kelly.

Publications

A. Minori, **B. Shih**, C. Christianson, M. T. Tolley. "3D Printed Shape Memory Polymer Composite for Fabric Actuation". Robot Makers Workshop at Robotics: Science and Systems (RSS), Michigan, USA. June 2016.

P. Tandon, S. Lam, **B. Shih**, T. Mehta, A. Mitev, Z. Ong. "Quantum Robotics: Primer on Current Science and Future Perspectives". Working paper, ResearchGate. May 2016.

J. M. Florez, **B. Shih**, Y. Bai, J. Paik. "Soft Pneumatic Actuators for Legged Locomotion". IEEE International Conference on Robotics and Biomimetics (ROBIO 2014), Bali, Indonesia. December 2014. Acceptance rate: 58.6% (374 of 638).

Honors

Semifinalist, Hackaday Prize 2015	August 2015
UC San Diego Irwin Jacobs School of Engineering Fellowship (154k USD)	February 2015
Winner, Intel Internet of Things Hackathon, Berlin (1.5k EUR)	April 2015
Finalist (top 25 out of 101 projects), HackZurich Hackathon	October 2014
Honorable Mention, National Science Foundation (NSF) Graduate Research Fellowship Program	April 2014
Scholarship of Excellence in Research at EPFL (20k CHF)	February 2014
Small Undergraduate Research Grant, Carnegie Mellon University (500 USD)	November 2011
NanoJapan NSF International Research Experience for Undergraduates Program	February 2011
Intel Science Talent Search, Semifinalist (1000 USD)	January 2009

Academic Mentoring

Nathan Adera. UCSD STARS. Soft, Torsional Sensor Development. June 2016 - present.
Kristen Matsuno. UCSD BS MechE. Epidermal Sensor Test Automation. Sept 2015 - June 2016.
Kazu Otani. UCSD BS MechE. Fluidic Strain Sensor. Sept 2015 - March 2016.
Basile Audergon. EPFL BS MechE. Soft Pneumatic Actuator Frame Fabrication. Dec 2014 - Apr 2015.
Nicolas Besuchet. EPFL BS MechE. Soft Pneumatic Actuator Frame Fabrication. Jan 2015 - Apr 2015.

Teaching

Graduate

Electrical and Computer Engineering Department, Carnegie Mellon University Pittsburgh, PA
18-202 Mathematical Foundations of Electrical Engineering Teaching Assistant August 2013 - December 2013

- Weekly office hours to review math topics.
- Course by: Prof. Tom Sullivan.

Undergraduate

Electrical and Computer Engineering Department, Carnegie Mellon University Pittsburgh, PA
18-320 Microelectronic Circuits Teaching Assistant August 2012 - December 2012

- Guide ∼30 students through amplifier design (analog) and transistor layouts in Cadence (digital). Lead two 3 hour/week lab sections.
- Course by: Prof. Jeyanandh Paramesh.

Electrical and Computer Engineering Department, Carnegie Mellon University Pittsburgh, PA
18-290 Signals and Systems Teaching Assistant August 2011 - December 2011

- Guided ∼30 students through various MATLAB activities related to introductory signal processing, including audio/speech processing and specgram analysis. Managed one 3 hour/week lab section.
- Course by: Prof. Bruce Krogh.

Professional Activities and Service

OpenWorm

Community Manager October 2015 - present

- Volunteer coordinator for open source neuroscience project creating virtual simulation of C. elegans. Wrote Javascript-based form to improve subproject introductions for volunteers.
- Organized online series of OpenWorm Journal Clubs. Five archived YouTube videos with ∼1300 views.
- Advised by: Dr. Stephen Larson

Ad-hoc Journal/Conference Reviewer

- Robotics and Autonomous Systems, ACM/IEEE International Conference on Human-Robot Interaction