Lucas Watson

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Maker focused on applications of emerging research. Interested in robotics, controls, acoustics, and applied physics.

Education

B.Sc Mechanical Engineering and B.A Physics
Boston University, Boston, MA
Expected Graduation: May 2019
GPA: 3.6 / 4.0

Relevant Coursework

- ME501 Dynamic System Theory
- ME520 Acoustics
- ME570 Robot Motion Planning
- (MIT) 6.881 - Intelligent Robot Manipulation

Honors and Awards

- Harold C. Case Scholarship
- Maneval Distinguished Research Fellowship
- Provost's Scholars Award for Academic Exploration
- Imagineering Project Competition – Best in Class, April 2017 & 2018
- Engineering and Design Portfolio – Best in Class, May 2017 & 2018
- Dean's List – All Full-Time Semesters

Skills

Programming Languages

Python, C++, JS/NodeJS, Ruby

Relevant Framework Experience

TensorFlow, Caffe, Robot Operating Sys (ROS), Arduino, Google Cartographer (SLAM)

Engineering Software

MATLAB, Simulink, Solidworks, Fusion 360, COMSOL Multi-physics, NumPy, SciPy

Fabrication and Experimentation

CNC Milling, Turning, Design for 3D Printing, Instrumentation Design, Numerical Analysis

Extracurriculars

Common Thread Podcast

Co-founder and producer of an interview-based podcast in the Howard Thurman Center.

Computer Science Community

Member of OpenWeb, MakeBU, and the Ignite Student Leadership Council.

Relevant Experience

Robotics Software Intern

PIAGGIO FAST FORWARD   JUNE 2017 - PRESENT

- Wrote production software, performed analyses, and created development tools for Gita, a cargo-carrying robot that follows you.
- Improved performance and implemented a vision processing neural network in Caffe for the Tegra TX2. Improved accuracy and reduced output comparison time in a critical algorithm by 3 orders of magnitude.
- Created simulation for our robot in Gazebo to verify motion dynamics.
- Designed and implemented code to enable our robot to evaluate it's physical state (ex: being lifted or bumped) via signal processing of IMU, LIDAR, and other data. **Currently runs on our robots.**
- Tested and improved our robot's following behavior by implementing a two degree-of-freedom PID controller based upon a Simulink model. **Currently runs on our robots.**
- Aided in creating processes to deploy workspace onto robot's distributed computer network. Created Docker emulation environment.
- Initiated development of an automated, customizable integration testing framework for ROS for testing nodes. To be open sourced.
- Analytically solved for our robot's motion dynamics, providing a basis for improving the drive and balancing algorithms.
- Became a go-to demonstrator for our robot. Responsible for pitching to various audiences. Analyzed user interactions.

Research Fellow

BU PHYSICAL ACOUSTICS LAB   DECEMBER 2017 - PRESENT

- Wrote two project proposals which received research awards through BU's UROP program and the College of Engineering.
- Instrumented experimental apparatuses to study cavitation (bubble collapse) in a fuel injector and cavitation in cylindrical resonators.
- Upcoming conference presentation and paper (November 2018).

Technology Innovation Scholars Program Mentor

COLLEGE OF ENGINEERING   SEPTEMBER 2016 - MAY 2017

- Promoted STEM to underprivileged high school students in Boston area by leading workshops in engineering design.
- Served as FIRST robotics mentor for local high school.

BostonHacks Director

BOSTONHACKS   APRIL 2017 - PRESENT

- Led BU's hackathon, hosting 480 students with a ~$40k budget.
- Grew hackathon attendance by 70%, and grew team from 14 to 30.

Physics Learning Assistant

PHYSICS DEPARTMENT   JANUARY 2017 - DECEMBER 2017

- Aided in teaching physics courses in discussion-based classrooms.

Relevant Projects — view a full portfolio at lkwatson.me/projects

Fasimov – a face recognizing table robot

Created Fasimov, a ROS-based robot to study a person's interactions with an emotive robot that can recognize their face and speak to them. Fasimov can also navigate a table by utilizing a ToF point cloud sensor integrated with Google Cartographer (a SLAM framework).

Matrix implementation of a neural network in Numpy

Built a digit-recognizing neural network from scratch in Python using NumPy. Implemented basic ML concepts to understand how they work.