

## Experience

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### **Graduate Researcher, University of California, San Diego** **June 2018 - Present**

- Existential Robotics Lab under Professor Nikolay Atanasov
- Implementation of a model-based reinforcement learning algorithm, PILCO, in Python.
- Researching modeling uncertainty through bayesian neural networks with dropout or probabilistic backpropagation.
- Hardware development of Quadcopter for autonomous flight in ROS using a Pixhawk, Intel NUCi7, MatrixVision Cameras on a stereo rig, VectorNav IMU, and downward facing Lidar Lite.

### **Undergraduate Researcher, University of Rochester** **June 2016 - December 2016**

- Wireless Communication and Network Group under Professor Wendi Heinzelman
- Developed a mobility model in NS-3 using C++ that represented elephant movements from received data to test the performance of a delay tolerant network protocol called Epidemic.
- Started the development of a learned probabilistic mobility model to extrapolate the elephant mobility model made.

### **Graduate Teaching Assistant, University of California, San Diego** **January 2019 – Present**

- Course: **ECE276A** (Sensing & Estimation in Robotics), **ECE276B** (Planning & Learning in Robotics)
- Duties: office hours, design of theoretical homework/final problems, and project/final grading.

### **Undergraduate Teaching Assistant, University of Rochester** **January 2014 - May 2017**

- Courses: **CSC160** (Engineering Computing), **CSC172** (Data Structures & Algorithms), **ECE242** (Communications Systems)
- Duties: laboratory hours, and graded assignments.

## Projects

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### **PILCO (Probabilistic Inference for Learning Control) Python** **June 2018 - August 2018**

- A model-based reinforcement learning algorithm that uses Gaussian Processes to model continuous dynamics and a parameterized policy to perform policy searches.
- Written in Python3 using Numpy, Scikit learn, and SciPy and tested on real space OpenAI Gym Environments.

### **Autonomous Quadcopter Hardware Design C++, Python** **June 2018 - August 2018**

- Set up of hardware components: Intel NUCi7, PixHawk, VectorNav IMU, and MatrixVision Cameras individually and to be seen in ROS as ROS nodes.
- Onboard Computing and Motor Analysis for desired computing capabilities and thrust to weight ratio.

### **SLAM (Simultaneous Localization and Mapping) Python** **December 2018**

- University of California, San Diego - ECE276A : Sensing and Estimation - Course Project
- A sensing and estimation algorithm that uses a Particle filter for state estimation and 2D occupancy grid for mapping.
- Implemented in Python with Numpy using IMU measurements and Lidar scans data.

### **First Person View (FPV) Quadcopter, C, Javascript, ASP.NET** **January 2017 - May 2017**

- Designed & developed a quadcopter, with a team of five, capable of flying through a 4G connection and live video streaming to a website.
- Developed a flight controller on the TI EK-TM4C123GXL board allowing for flight with a 2.5 GHz controller or gamepad controller connected to a laptop. Functionality for altitude holding using a lidar incorporated.
- Assisted in the communication design between the gamepad and Raspberry PI 3 on the quadcopter which received and ported data through the 4G connection.

## Education

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### **University of California, San Diego** *San Diego, CA* **September 2017 – Expected June 2019**

M.S. in Electrical Engineering  
Focus: *Intelligent Systems, Robotics, & Control*

### **University of Rochester** *Rochester, NY* **September 2013 - May 2017**

B.S. in Electrical and Computer Engineering

## Leadership & Skills

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**Computer Languages:** Python, C++, Matlab, C, Java, Bash

**Computer Software Tools:** Tensorflow, ROS, PyTorch, Linux, Git, Latex

**Leadership Positions:** Jacob's Engineering Undergraduate Mentor, UR IEEE Student Branch Secretary

**Activities:** IEEE, IEEE RAS, Tutoring, Research, Urban Exploring, Hiking,

**Languages:** English, German (Native Fluency)