# Jared Porter

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## Education

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| 2013 - 2016,<br>2018 - 2022 | **Ph.D. Mechanical Engineering**, *University of California, Berkeley*<br>Major: Control Systems<br>Minors: Optimization, Statistical Learning Theory |
| 2009 - 2013 | **B.S. Electrical Engineering and Computer Science**, *University of California, Berkeley* |
| 2009 - 2013 | **B.S. Mechanical Engineering**, *University of California, Berkeley* |

## Research

**2013 - 2015, 2018-2022**  **Ph.D. Research**, *University of California, Berkeley*

Advised by Prof. Kameshwar Poolla and Prof. Pravin Varaiya

- **Thesis Work: Empirical Study of Connected Vehicle Data and Its Application to Traffic Measurement**
  - Processed and analyzed over 250 million vehicle trace datapoints to study applications of connected vehicle datasets.
  - Analyzed how sampling rate of the dataset affected fidelity of traffic flow measurements.
  - Developed a sampling rate agnostic measurement of intersection queue lengths.
  - Utilized Virterbi Search to snap noisy measurements to most likely lane assignments.
  - Aggregated and clustered sparse data to extract macroscopic fundamental diagrams.
- **Automated Power Exchange**
  - Developed microgrid optimization algorithms to create optimal bidding strategies for agents participating in an automated power exchange market.
  - Wrote multi-agent simulation to evaluate effectiveness of a real-time power exchange market.
- **Energy Sharing Economy**
  - Developed alternative solar power strategies over net metering including shared community investment in energy storage.
  - Policies designed to create incentives for an economically optimal investment in solar.
  - Investigated potential for combining a peak shaving mobile energy storage service with rideshare programs.

**2011 - 2013**  **Undergraduate Research**, *University of California, Berkeley*

Supervised by Prof. Andy Packard

- **Modular Greenhouse Testbed**
  - Greenhouse environment controlled with servo, fan, and heater actuators.
  - Temperature and flourescence sensors monitored environment and plant state.
  - Wrote LabView software to run automated plant stress tests.

## Work Experience

**2016 - 2017**  **Design Engineer**, *PhaseSpace, Inc*

- Product Design
  - Designed and created mechanical housings. Designs were drafted using Autodesk Inventor and printed using SLA and FDM 3D printers.
- Production
  - Created mechanical drawings and coordinated outsourced production of accessory products.
- Testing and Validation
  - Validated system latency tests for motion capture systems in collaboration with NIST and contributed improvements to mechanical design and data analysis of standardized experiments.
  - Constructed testing rigs for analyzing and calibrating motion capture cameras.

**2018**  **Design Engineering Contractor**

- Rapid Hardware Prototyping
  - With fast turnaround, designed and constructed hardware prototypes for VR and AR applications.

## Additional Experience

**Fall 2018, Spring 2020**

**Graduate Student Instructor**
- **ME100/EE49:** *Internet of Things*
  - Hosted lab and discussion sections for introductory course to circuits, microcontrollers, and connecting devices to the internet.
  - Improved upon custom builds of micropython and serial communication for the ESP32 microcontroller.

**Summer 2012, Summer 2013**

**Undergraduate Student Instrcutor**
- **E7:** *Introduction to Computer Programming for Scientists and Engineers*
  - Held lab sections for introductory programming course in Matlab.
  - Aided in writing and testing course autograder.
- **EE40:** *Introduction to Microelectronic Circuits*
  - Ran the lab section of introductory course to circuits.

**2014 - 2015**

**Volunteer Instructor for Prison University Project**
Taught a math course once a week for 3 semesters at San Quentin Prison.
- **Math 50A:** *Developmental Math*
- **Math 99:** *Elementary Algebra*

**2010 - 2013**

**Volunteer for Pioneers in Engineering**
PiE is a STEM outreach program that creates a highschool robotics program with goals of encouraging students to pursue higher education in STEM.
- **PiE Mentor**
  - Twice a mentor for high school students through a seven week robotics competition.
- **Kit Development Electrical Lead**
  - Managed electrical staff to develop in-house Robotics Kit components of the 2011-2012 competititon.
  - Designed and produced custom microcontroller shields and motor controllers.
- **Kit Development Coordinator**
  - Directed Electrical, Mechanical, and Software leads to organize 70 kit development staff.
  - Managed a budget of $33,000 towards prototyping and producing year's robotics kit.
  - Worked to ensure development of reliable and intuitive kit for high school students.

## Technical Skills

**Languages** Matlab, Python

**Software** Pandas, CVX, Tensorflow, Linux, Autodesk Inventor, Simulink, Labview, Microsoft Office

**Course Work** Systems Theory, Optimization, Statistical Learning Theory, Stochastic Processes and Systems Theory, Topology and Real Analysis, Deep Reinforcement Learning, Electrical Power Systems, Energy and Environmental Markets

**Other** Through-hole Soldering, Surface-Mount Soldering

## Publications

[1] Jared Porter. *Empirical Study of Connected Vehicle Data and Its Application to Traffic Measurement*. PhD thesis, Berkeley, CA, 2022.

[2] Jared Porter, Michael Pedrasa, Andy Woo, and Kameshwar Poolla. Combining storage and generation for prepaid electricity service. pages 422–427, 11 2015.

[3] Junjie Qin, Jared Porter, Kameshwar Poolla, and Pravin Varaiya. Piggyback on tncs for electricity services: Spatial pricing and synergetic value. pages 500–507, 07 2020.

[4] Hamidreza Tavafoghi, Jared Porter, Christopher Flores, Kameshwar Poolla, and Pravin Varaiya. Queue length estimation from connected vehicles with low and unknown penetration level. pages 1217–1224, 09 2021.

[5] Chenye Wu, Jared Porter, and Kameshwar Poolla. Community storage for firming. pages 570–575, 11 2016.