HARLEY PATTON

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EDUCATION

University of California, Berkeley   Berkeley, CA
Intended B.A. Computer Science, B.A. Applied Mathematics   *August 2015 - Present*

- GPA: 3.95
- Relevant Coursework: Structure and Interpretation of Computer Programs, Data Structures, Machine Architecture, Machine Learning, Efficient Algorithms and Intractable Problems, Designing Information Devices and Systems, Quantum Computation and Information Science, Discrete Mathematics and Probability Theory, Linear Algebra and Differential Equations, Multivariable Calculus
- Fall 2017 Coursework: Special Topics in Deep Learning (graduate), Artificial Intelligence, Introduction to Database Systems
- Member of Upsilon Pi Epsilon, Nu Chapter (Computer Science Honor Society)
- Brother at Sigma Phi Epsilon, Cal Alpha Chapter

EXPERIENCE

Rigetti Computing   Berkeley, CA
Software Engineer Intern   *May 2017 - August 2017*

- Contributed to a Python library (pyquil.readthedocs.io) that allows users to construct Quil (Quantum Instruction Language) programs and run them on an in-house Quantum Processing Unit over the cloud.
- Wrote and deployed an interactive website (demo.rigetti.com) to demonstrate the ability of quantum algorithms to find approximate solutions to NP-complete problems.
- Deployed a large-scale data lake on AWS servers in order to store readout values from the calibration of the in-house control systems.

Lawrence Berkeley National Laboratory   Berkeley, CA
Research Apprentice   *August 2016 - Present*

- Works for the European Organization for Nuclear Research (CERN) through Lawrence Berkeley National Lab. Part of the LBNL Atlas Analysis Team, working with data brought in from the ATLAS experiment at the Large Hadron Collider at CERN.
- Writes data analysis modules in C++ for ROOT (an object-oriented framework for large scale data analysis) in order to resolve issues of detector performance, efficiency, and alignment.
- Currently writing a neural network to classify different particle types, using measurements of the stopping power exerted on different layers of the ATLAS pixel detectors as features.
- Previously designed and implemented a regression model that takes in existing data from the Large Hadron Collider alongside data simulated using Pythia 8 (particle simulator) in order to accurately predict the quark/gluon composition of particle jets resulting from proton-proton collisions.

UC Berkeley EECS Department   Berkeley, CA
Student Instructor   *August 2016 - Present*

- Teaches a discussion section for Computer Science 70 (Discrete Mathematics and Probability Theory). Meets twice per week with a group of fifty lower division students and lectures on the course material. Also holds office hours, holds homework parties, grades exams, and helps maintain the course website (eecs70.org).
- Previously an Academic Intern for Computer Science 61A (Structure and Interpretation of Computer Programs). Led the lab component of the course each week and held weekly office hours.

PROJECTS

Facelift: Web application that adds imperceptible noise to photos that contain faces in order to cause deep facial recognition algorithms (such as Facebook's DeepFace) to misclassify, allowing users to protect their privacy online. Uses Haar-cascade facial detection algorithms and a partial gradient descent based adverserial attack.

Enigma: Computer simulation of the German M4 Enigma Machine used to encrypt messages during World War II. Recreates the full Enigma system used by the German Navy, consisting of eight moving rotors, two fixed rotors, and two reflectors. Implements a progressive substitution cipher, allowing for 614,175,744 unique possible encryptions of any text string.

BearMaps: Backend of mapping program rendering Berkeley campus and surrounding area, using data pulled from OpenStreetMap. Finds routes using A*.