DONALD PIERCE

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EDUCATION

New York University — **New York, NY**
B.A. Physics, B.A. Mathematics | Courant Institute — *September 2014 - May 2019*

- Treasurer of the Society of Physics Students *(2016-2017)*
- **Relevant Coursework:** Linear Algebra, Ordinary and Partial Differential Equations, Multivariate Calculus, Computational Modeling and Simulation, Combinatorics with Graph Theory, Probability Theory

RESEARCH EXPERIENCE

ATLAS Experiment through NYU Physics — New York, NY
Data Scientist in Experimental Particle Physics at CERN — *May 2016 - May 2019*

- Developed a novel method to optimize algorithm efficiency by weighting results from different algorithms
- The hybrid algorithm approach using bisection optimization was approved for testing and is currently in use in three data-collection chains at the Large Hadron Collider ATLAS experiment as of April 2018, filters TBs / sec
- Gave more than 12 talks presenting on algorithm efficiency, correlation between ATLAS algorithms, and hybrid algorithm approaches to the Missing Transverse Momentum (MET) Group at CERN
- Work has contributed to both the ATLAS 2017 PUB Note and the upcoming Run 2 Performance Note
- Used C++ with the ROOT Data Analysis Framework to design new data-collection algorithms
- Became an authorized CERN cloud user; compile data into ROOT trees over globally-distributed Linux servers

Center for Quantum Phenomena at NYU Physics — New York, NY
Study in Quantum Computing — *May 2018 - March 2019*

- Developing course notes for a class on quantum computing using Rigetti's Forest SDK
- Studying the foundations of quantum machine learning
- Running optimization experiments in Labber which tune microwave frequencies for 5mK QBit measurements

WORK EXPERIENCE

Spheryx, Inc. — New York, NY
Software Developer and Scientific Research Intern — *May 2018 - August 2018*

- Designed algorithms which process large pandas data-frames and extract scientific plots for users
- Gave three talks presenting on new methods to computationally profile nano-particle flows suspended in chemical solutions from video data; using better logic and fit algorithms
- Built a user-friendly web app using Dash by Plotly for scientists at the company to more easily process videos
- Studied potential applications of TensorFlow in company software, such as for learning particle type and position

SELECTED INDEPENDENT PROJECTS

Traffic — New York, NY
Machine Learning in Python available at github.com/donjpierce/traffic — *November 2018 - February 2019*

- Designing a reinforcement learning algorithm for my own simulation of traffic flow on real road networks
- Using Q-learning and ϵ-greedy techniques to allow cars to try alternate routes until shortest time is found
- Using TensorFlow and Keras to train a three-layer learning architecture

AWARDS

- **NYU DURF Grant** — Awarded $1,000 for "compelling and significant" research — *November, 2017*

SKILLS & INTERESTS

- **Languages** Proficient in Python, Pandas, NumPy, C++, ROOT; familiar with TensorFlow, Amazon Web Services (RDS, S3, Neptune, EC2), Gremlin, SQL, Jinja2, HTML; experienced with Git, Unix/Linux, Flask, Mathematica, MATLAB, Vim, LaTeX

Python **C++** **TensorFlow**

- **Hobbies** Stargazing, playing jazz sax, writing philosophy, thinking about how to design the cities of the future