Haicheng Charles Zhao

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Education & Relevant Coursework

Princeton University, **CS & Physics**, *2017 – 2021*, GPA: 4.0
Machine Learning, Computer Vision, Algorithms, Operating Systems, Compilers, Optimization, Econometrics, Probability Theory, Linear Algebra, Multivariable Calculus

Thomas Jefferson High School for Science and Tech, *2013 – 2017*
SAT (new): 1600

Languages & Technologies

General: Python • Java • C • C++ • OCaml
Stats/ML: PyTorch • scikit-learn • TensorFlow • Stata
Web: Javascript • jQuery • SCSS • React • Redux • Django • Flask • Jekyll
Other: Git • Linux • OpenCV • ROS • MPI • OpenMP • ANTLR • Messenger Platform

Experience

Quantitative Research Analyst Intern, *Stevens Capital Management* *May 2019 — August 2019*
- Researched and developed volatility models and trade execution algorithms using machine learning, econometrics, and parallel computing.

Data Science Lead, *NJ Student Climate Advocates* *March 2019 — Present*
- Lead a team of eleven students in performing data science projects to guide and verify the organization's work.
- Work closely with other team leaders to develop policy proposals and necessary research.
- Performed an analysis of the household impact per income quantile of a per-ton carbon fee with a flat dividend.

Computer Science and Mathematics Division Intern, *Oak Ridge National Laboratory* *May 2018 — August 2018*
- Implemented compilers with ANTLR and C++ to compile the IBM OpenQASM, Rigetti Quil, and ProjectQ quantum languages to the Eclipse XACC intermediate representation. Updated ANTLR grammars for OpenQASM and Quil, and wrote a grammar for ProjectQ.
- Developed a modular command line admin interface (CLI) in Python for Profiles, the lab's new internal website similar to LinkedIn that allows researchers to create multiple "targeted" profiles. The CLI scrapes web sources to pre-fill researcher information and allows an admin to perform CRUD operations with the Spring backend.

Software Engineer, *PrepFactory* *June 2017 — January 2018*
- Convinced founder to let me code after learning React and Redux and developing a feature prototype over a weekend.
- Collaborated with startup founder to design a clean and interactive UI for practice tests, and then developed a web app implementing these practice tests, now used throughout the website.
- Designed an adaptive diagnostic algorithm that quickly estimates a score range and confidence level on the ACT.
- Managed several other interns throughout this project.

Projects

Model-Based Search for Extended Emission-Line Regions *January 2020 — May 2020*
- Developed an approach to extract EELRs from multi-band images without targeted spectroscopic measurements
- Use Gaussian Process regression to generate samples of likely EELR spectra, and then compute a likelihood-weighted model average of each EELR's morphology and spectrum to produce the final estimator
- This approach especially useful for finding known or suspected physical processes in future large astronomical surveys

AIM Robotics FIRST Robotics Competition (FRC) Team, Lead Programmer *November 2016 — June 2017*
- Persuaded team to scrap all old code, and designed a modular architecture with continuous integration.
- Implemented self-correcting steering in Python and used computer vision with OpenCV to implement autonomy.
- Developed a dashboard with Electron displaying various information from the robot, including the results of my computer vision code and data from sonar sensors. The dashboard also allows remote configuration of the robot.
- Won Innovation in Control Award and made it to District Championships for first time in the team's history.

Solace: Exploratory Autonomous Vehicle Research Project *September 2016 — June 2017*
- Built a 1/8th-scale R/C car mounted with various sensors and programmed it using the Robot Operating System (ROS) and Python to drive autonomously to a specified location, through both known and unknown areas.
- Designed novel method for dynamically determining the optimal path through both known and unknown areas by coupling Adaptive Monte Carlo Localization (AMCL) with the Gmapping SLAM algorithm using image stitching.

Awards & Achievements

Shapiro Prize for Academic Excellence *September 2018, September 2019*
Awarded to top-performing Princeton freshmen and sophomores based on academic record. Won the prize in both years.

3rd Place in National Economics Challenge Adam Smith Division *May 2017*
Selected as one of top four from my school to compete in the national semi-finals and then finals in New York. First time a team from Virginia made it to the final round of this competition, in which more than 11,000 students participated.

MIT Beaver Works Summer Institute *August 2016*
Selected as one of 40 students nationwide to participate in this 4-week program concerning autonomous vehicles. At end of program, selected by faculty as most likely to be an "Inventor of Something Big."