

# Haicheng Charles ZHAO

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## EDUCATION & RELEVANT COURSEWORK

**Princeton University**, 2017 – 2021, GPA: 4.0

*Concentrating in Computer Science, with a Finance Certificate*

Algorithms & Data Structures, Programming Systems, Microeconomic Theory, Statistics, Advanced Linear Algebra, Multivariable Calculus

**Thomas Jefferson High School for Science and Technology**, 2013 – 2017

SAT (NEW): 1600

Artificial Intelligence, Parallel Computing, Web & Mobile App Development, AP Micro- & Macroeconomics

## EXPERIENCE

*Computer Science Intern*, **Oak Ridge National Laboratory**

May 2018 – August 2018

- Wrote compilers using ANTLR and C++ to compile the IBM OpenQASM, Rigetti Quil, and ProjectQ quantum languages to the Eclipse XACC intermediate representation.
- Wrote a command line admin interface (CLI) in Python for Profiles, which is the lab's internal website similar to LinkedIn that allows users to create multiple "targeted" profiles. The CLI scrapes web data sources to pre-fill profile information.

*Software Engineer*, **PrepFactory**

June 2017 – January 2018

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

*Technology and Finance Lead*, **TJ Intermediate Open in Informatics**

November 2016 – June 2017

- Organized and ran TJ IOI, a seven-hour high school programming competition in which eight teams competed.
- As Technology Lead, created a restricted Linux virtual machine on which participants programmed.
- As Finance Lead, managed a team that contacted companies and acquired over \$2,000 for shirts, food, facilities, and prizes.

*Co-Captain*, **Senior Computer Team**

September 2016 – June 2017

- Wrote and gave lectures on algorithms, especially those tested in the USA Computing Olympiad (USACO), at weekly 40-minute meetings.
- Held contests and selected teams to participate in programming competitions.

## TECHNICAL PROJECTS

**Epochs: A Time Micromanagement App**

August 2017 – January 2018

- Used React and Redux to develop a progressive web app (PWA) that allows users to micromanage their time.

**AIM Robotics FIRST Robotics Competition (FRC) Team, Lead Programmer**

November 2016 – June 2017

- Persuaded team to scrap all old code, and designed a structured, modular software framework with continuous integration.
- Implemented accurate self-correcting driving using several layers of feed-forward PID controllers in Python.
- Used PID controllers and computer vision with OpenCV to implement an autonomous phase where the robot could reliably locate a rod, drive to it, and release a gear onto it.
- Won Innovation in Control Award.

**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.

**AlexaBot**

March 2016 – July 2016

- Developed Facebook Messenger bot that lets a user interact with Amazon Alexa remotely through text rather than speech.
- Wrote bot in Python using Tornado while Messenger Platform was still in beta.
- Bot has had more than 2000 users, and we ensured reliable uptime and quick bug-fixing during its increase in popularity.

## AWARDS & ACHIEVEMENTS

**2nd Place in VCU High School Programming Contest**

March 2017

Won 2nd place out of 40 teams in this algorithms contest hosted by Virginia Commonwealth University.

**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."

**Best Website at HackTJ 2016**

February 2016

Developed website that teaches Mandarin definitions and pronunciations. Best website out of 120 teams.