Hank Wu

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Design Portfolio

Experience

Maple Precision – Software Developer Intern
February 2020 - Present

- Developing **3D geospatial** topography maps and models through quantized meshing of databases of **lidar point clouds**, satellite imaging, and maps, using **PostgreSQL**
- Improving, Optimizing, and adding features to the Maple Precision Web App. Using **JavaScript**, **HTML**, and **React** for front end development. Using **GraphQL**, MongoDB, **Amazon Web Services**, Django, **Java**, **Python** for back end development

Reach – Internet Access Through SMS
September 2019 - January 2020

- Built an automated program using **JavaScript** with **Node.js** that allows users to access the internet features through text messaging, including: Directions, Weather, News, Wikipedia Articles, Unit and Currency Conversion. Used **Google Maps and News APIs** and **Fixer API**
- Used **Google Firebase** to host my program on **cloud servers** to process and compute user request and **Twilio** to automatically send and receive SMS

Responsum – Educational Software
December 2019 - Present

- Building a Web App with surveying, forums, and live polling services for class as academic class representative on **UWaterloo Cloud Servers**. Using React, **HTML**, and **JavaScript**

Train μ – Machine Learning Sports Trainer
February 2020

- Built, trained, and ran a **machine learning model** to analyze sports footage and help users improve athletic form, achieving **top 3** out of over **100 teams** at Hack the Valley 4
- Used **TensorFlow** and Openpos for machine learning and dataset. Used **Python** and **Google Cloud Servers**, and **Django** for backend, and **JavaScript**, HTML, and **React** for frontend

Design Teams

Waterloop - SpaceX Hyperloop Team
September 2019 - Present

Linear Induction Motor Team Lead

- **Leading** a team of **over 25 students** prototyping, designing, and building a linear induction motor creating a new method of transportation to compete in the **Hyperloop Competition**
- Coordinating and working with a variety of teams to **integrate** software and hardware **subsystems** and create a full-sized functioning **linear induction motor (LIM)**
- Programming, configuring, and wiring **embedded systems** with Magnetometer, Hall Effect sensor, Digital Temperature sensor, and Accelerometer to collect data through trial runs
- Creating computer **simulations** of the LIM using **ANSYS** to apply **Maxwell's equations**

UWAFT - General Motors EcoCAR Team
September 2019 - Present

Connected Autonomous Vehicle Team Member

- Programming autonomous software using **C++** in **ROS** (Robot Operating System) on **Linux** to perform **sensor diagnostics** and **sensor fusion** to compete in the **EcoCAR Competition**
- Using **MATLAB** and **Simulink** to create **simulations** in order to test vehicle's autonomous capabilities and performance across all possible scenarios
- Processing **CAN bus** (Controller Area Network) data using **C++** data structures and algorithms in ROS to detect and counteract failures within **microcontrollers**, devices, and communication between control units in the vehicle system

Fleetwood Park VEX Robotics
September 2015 - August 2019

Software Team Lead

- Programmed **autonomous mode** using **C** for five unique Robots to operate without human control and adapt its trajectory based on sensor data through a **closed loop design**
- Coded **embedded sensors**, motor controllers, and remote-control scheme for the Robot

Awards

1st Place
Waterloo Engineering Competition
(Senior Design 2019)

1st Place
Kwantlen Senior Science Challenge 2019

1st Place
Vancouver Math Olympiad 2018

Top 3/100 Teams
Hack the Valley 4 Hackathon 2020

B1 DELF Certificate
French Professional Working Proficiency

Toolkit

Native Speaker:
Java, Python, JavaScript, C++, C#, C, Firebase, PostgreSQL, Git, HTML, MongoDB, Django, Unix, Linux, Swift, Amazon Web Services, React, NodeJS

Conversationally Fluent:
Tensorflow, TypeScript, HTML5, Bash, ROS (Robot Operating Software), Keras, Redis, Flutter, Agile, Google Cloud Servers

Curious Tourist:
Postgres, WebGL, Potree, Chart.js, PyTorch, Agile, Entwine, AJAX, ANSYS

Education

University of Waterloo Mechatronics Engineering, Honours.
Sept. 2019 – Present

Intended Minors: Artificial Intelligence, Software Engineering
(Will be taking 7 courses per term)

Activities: Data Science Club, Model UN, Academic Class Representative, Residence Council Volunteer, Engineering Society Member

Scholarships: Loran Scholar Finalist, Waterloo President's Scholarship, BC District scholarship