Hank Wu

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Experience

Royal Bank of Canada — *Banking Enterprise Applications*
Software Developer — *September 2020 - Present*

- Building a **CI/CD Jenkins pipeline** with **auto remediation** using **Java** to automate deployment to AWS **S3 buckets**
- Developing **feedback-based** recommendation **methods** in **C++** over **subsets of prefetches** for Web App
- Designed and scripted a **database transfer** from **MySQL** to **MongoDB** with **Python** for upcoming mobile app
- Utilizing **Splunk** to perform **data analytics** and create data visualization models across **hundreds of pipelines** company wide

Maple Precision — *Velocity Accelerator Startup*
Software Engineer — *January 2020 - April 2020*

- Designed **backend** features for the Equator Web App. Built **login system**, customer support **live chat**, and user profile and project portfolio. Improved existing features such as 3D view and **OAuth** tokens. Using **MERN stack** for development
- Built a **layered search engine** by implementing PageRank. Using **AWS**, **Docker**, and **Kubernetes** for hosting and deployment
- Migrated **server side map rendering process** from CPU to GPU,increased **CRI efficiency** by **176%**, decreased **runtime** by **53%**

Autonomous Vehicle Research and Intelligence Lab, University of Waterloo — *Machine Learning Lab*
Machine Learning Engineer — *May 2020 - August 2020*

- Created a **facial recognition convolutional neural network** using PyTorch. Generated **100,000 data points** by applying Stack GAN on Kaggle datasets using **GCP TPUs**. Achieved **optimized layer operations**, **backpropagation**, and **genetic learning**
- Built end-to-end **data collection**,**training**, **inference pipeline**. Researched **network pruning** and **hyperparameter search**

Projects

Responsum - Educational Web Application
HTTPS://GITHUB.COM/HANK-W/RESPON_SUM — *2019 - Present*

- Building a **web app** with **live quizzing**, **forums**, and learning resources. **Launching** in Fall in class of **135** UWaterloo **students**.
- Connecting students, professors, and classes with **statistics** and **performance metrics** for students, classes, and questions. Searchable, orderable, and pageable content for learning by category, difficulty, and format. Built **middleware** for backend.
- Designed **REST API** with **RAML**. Using **MERN stack** for development. Automated API tests with **Postman**. Hosting on GCP

Reach - Internet Access Through SMS
HTTPS://HANK-W.GITHUB.IO/REACH.HTML — *2019*

- Built an **automated** program using **Node.js** to enable internet features through SMS including directions, weather, news, web page text, unit and currency conversion, and Wikipedia articles. Used **APIs** from **Google Maps** and **News**, **XE**, Wikipedia.
- Hosted program on **Firebase** cloud servers. Used **Twilio** to automate sending and receiving SMS text messages.

QR-CNN – Quantum Computing Mask R-CNN
HTTPS://GITHUB.COM/HANK-W/QUANTUM-MASK-R-CNN — *2020*

- **Created** and **trained** MASK R-CNN model on live vehicle footage to return **instance segmentation** with object tracking
- Integrated **Qiskit** with PyTorch to speed up model training **efficiency** by **310%** and model **runtime** by **90%**
- Applied **parameter binding** and **expectation value evaluation** to optimize **tensorization** of video frames
- Utilized **GCP** for **cloud computing** power, Python for code, and open source ML libraries with **Cirq**

Hackathons & Awards

2020	**Winner**, Hack the Valley 4, awarded prize from Facebook, top 3/100 teams	*Hackathon*
2020	**Mentor**, StarterHacks, HobbyHacks, NWHacks, Brick Hack	*Hackathon*
2019	**Winner**, Hack The North, and won Deloitte coding challenge	*Hackathon*
2019	**1st place**, Waterloo Engineering Competition, Senior Division	*Engineering*
2019	**1st place**, KPU Senior Science Challenge, led team of nine students	*Science*

Skills

Backend C++ · Java · Python · JavaScript (ES6) · Express.js · Node.js · Django · Ruby on Rails · AngularJS · REST API · Bash · GraphQL

Database and Cloud AWS · GCP · Firebase · Atlas · MongoDB · PostgreSQL· MySQL · Redis · Hadoop · Git · Docker · Kubernetes

Machine Learning TensorFlow · PyTorch · Keras · R · MASK R-CNN · Matplotlib · Spark · Kaggle · Jupyter · Pandas · NumPy · OpenCV

Education

University of Waterloo — *September 2019 - April 2023*
Overloading 7 courses/term

B.Eng in Mechatronics Engineering | Minor in Software Engineering | GPA: 3.9
Relevant Coursework: Datastructures and Algorithims, C++ Programming, Systems Design