Calvin Huang

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Education

- **University of Michigan** — Ann Arbor, MI
  BSE Computer Science, GPA: 3.81 — *September 2018-expected December 2021*
  - Course Highlights: Natural Language Processing, Computer Vision, Machine Learning, Programming Languages, Operating Systems, Cybersecurity, Data Structures and Algorithms, Web Systems, Databases, Computer Architecture, Fundamentals of Computer Science, Linear Algebra

Professional Experience

- **ProQuest** — Ann Arbor, MI
  Machine Learning Software Engineer — *January 2021-Present*
  - Leveraged BERT and T5 transformer neural networks to correct over a million erroneous documents scanned from optical character recognition systems.
  - Collaborated with team of students to implement large-scale text correction pipeline for ProQuest's TDM Studio application.
- **Capital One - Cloud Productivity Engineering** — Remote
  Software Engineering Intern — *June 2021-August 2021*
  - Migrated data testing tools to a serverless architecture on AWS, saving 160+ developer hours for every version upgrade and achieving over 97.2% cost-savings in the cloud.
  - Obtained official AWS Solutions Architect and Certified Secure Software Engineer Certifications while leading implementation efforts on the team.
- **Principal Financial Group** — Remote
  Full-Stack Software Intern — *June 2020-August 2020*
  - Spearheaded the transition to a new logging system, added security features to app deployment pipeline via back-end implementation and Ansible automation, and created a server check for conflicting jobs in order ensure reliable metrics on feature changes and deployments.
  - Added deployment API features by implementing cyclical redeployment functionality and reducing deployment downtime with dynamic scheduling.
  - Led intern Code Jam team in brainstorming and development of a full-stack web app hosted in AWS and mentored peers in working with web frameworks and deployment methods within the span four days.
- **Radiological Health Engineering Laboratory** — Ann Arbor, MI
  Research Assistant, Dr. Kimberlee Kearfott — *September 2019-Present*
  - Researched and trained machine learning models to correlate weather and radon data to predict indoor radiation levels for use in early detection of earthquakes.
  - Designed and deployed MySQL cloud database for weather and radiation sensor data to be displayed on a monitoring website. Wrote data processing pipeline for sanitizing and organizing sensor data before storage.
  - Developed iOS and Android apps with a heat map interface for tracking radiation data collected by student-built radiation detectors powered by Raspberry Pi's.
- **UM::Autonomy Project Team** — Ann Arbor, MI
  Deep Learning Computer Vision Engineer — *September 2020-May 2021*
  - Trained deep convolutional neural net for object detection task using boat camera footage and tested architecture configurations to tune color recognition capabilities.
  - Labeled and processed training data using video footage collected from past competitions for use in training the neural net.
- **MRover Project Team** — Ann Arbor, MI
  Computer Vision Engineer — *September 2018-May 2020*
  - Implemented AR tag detection algorithm using OpenCV for a find-and-identify task in the University Rover Challenge.
  - Presented professional design reviews to the team to interface with other sub-teams in order to decide design priorities for implementing obstacle detection.

Projects

- **Multi-label Audio Instrument Classification**
  Computer Vision Group Final Project
  - Compared waveform and spectrogram approaches to audio classification on the IRMAS instrument audio dataset using deep neural nets.
  - Optimized YAMNet and SoundNet architectures to achieve 88.42% mAP using waveforms and 91.44% mAP using spectrograms on test instrument data.
- **Robotic Arm Control Application**
  Desktop Simulation Application for Robotic Arm Automation
  - Implemented full kinematics library using state of the art inverse kinematics algorithms in Python and TypeScript.
  - Leveraged WebGL technologies to create simulation and automated control application for the robotic arm using Electron and React frameworks.
- **COVID-19 Heatmap**
  Web Application and API for Monitoring Projections of the Spread of COVID-19
  - Developed efficient REST API with Rust to collect and sanitize detailed geographical data at specified time intervals and to communicate current data on-demand to front-end applications.
  - Designed client-side web app using React and Google Maps to visualize global and local data of COVID-19 cases using configurable heat maps.
- **Video Conferencing Web Application**
  Video Chat Web Application for Virtual Hangouts
  - Incorporated WebRTC video technology into modern video-client web app designed to be provide self-hosted peer-to-peer video communications.
  - Utilized Node.js back-end socketing and custom peer-to-peer server for reliable and secure video calls across different devices.

Skills

- **Programming Languages**
  Python, C/C++, Java, Javascript/TypeScript, C#/.NET, MATLAB, Swift, Rust, Julia, MySQL, MongoDB, DynamoDB
- **Technologies and Frameworks**
  Jupyter Notebook, PyTorch, TensorFlow 2.0, OpenCV, HuggingFace React, NodeJS, Flask, JAX-RS, AWS, Google Cloud

Certifications and Honors

- **AWS Certified Solutions Architect - Associate** *August 2021*
- **Health Physics Society Annual Meeting Presenter** *July 2021*
- **University Honors** *December 2018-Present*
- **Dean's List** *December 2018-Present*
- **James B. Angell Scholar** *March 2020*
- **MTV Undergraduate Fellowship Recipient** *Fall 2020, Winter 2021*
- **Tau Beta Pi, Michigan Gamma Chapter** *September 2019-Present*
- **Eta Kappa Nu, Beta-Epsilon Chapter** *September 2020-Present*

Coursework

- **Introduction to Programming - CS 312**
  - Introduction to Computers and Programming (ENGR 101)
- **Discrete Math for Computer Science - CS 311**
  - Discrete Math (EECS 203): Passed at Jiao-Tong University for transfer credit
- **Data Structures - CS 314**
  - Programming and Introductory Data Structures (EECS 280): A
  - Data Structures and Algorithms (EECS 281): B
- **Algorithms and Complexity - CS 331**
  - Fundamentals of Computer Science (EECS 376): B+
- **Computer Organization and Architecture - CS 429**
  - Introduction to Computer Organization (EECS 370): Pass via COVID-19 policy
- **Principles of Computer Systems - CS 439**
  - Introduction to Operating Systems (EECS 482): B+
  - Special Topics Advanced Operating Systems (EECS 498): B+
- **Additional Relevant Coursework**
  - Introduction to Machine Learning (EECS 445): A-
  - Computer Vision (EECS 442): A
  - Natural Language Processing (EECS 595): In Progress
  - Programming Languages (EECS 490): In Progress