Fang Han

https://www.linkedin.com/in/fang-han-368b1a124/ +1-734-680-3913
https://github.com/HanFa hanfa@umich.edu

Education

- **University of Michigan** Ann Arbor, MI
  Computer Science B.S.E 3.85/4.00 *Sept. 2016 – Dec. 2018*
  Machine Learning, Web Systems, Embedding Systems, Operating Systems, Data Structure & Algorithms
- **UM-SJTU Joint Institute at Shanghai Jiao Tong University** Shanghai, China
  Electrical and Computer Engineering B.S.E 3.65/4.00 *Sept. 2014 – Aug. 2018*
  Methods and Tools for Big Data, Cryptography, Computer Programming

Research Experience

- **Security Analysis of Machine-Learning-Based Sensing in CAV Systems** Ann Arbor, MI
  Research Intern | SPQR Lab *Jan. 2019 - Present*
  - Trained and validated DNN models (Voxelnet, SECOND and PointPillars) for LiDAR-based 3D obstacle detection.
  - Exposed the vulnerabilities in these models when sensors are under electromagnetic interference. Simulated, predicted, and confirmed a decision alteration in high-level autopilot system. Deploy the simulation program using Docker containers in remote AWS servers.
  - Built a platform-independent visualizer for point cloud files with mainstream formats to convenient LiDAR signal researchers. Visualized the LiDAR traces and interference using OpenGL with the library Three.js.
- **Integrated Virtual Vehicle Simulation Platform on Android: *Just Go*** Shanghai, China
  Capstone Design Intern | Intel Shanghai *Jun. 2018 – Aug. 2018*
  - Developed and presented an Android simulation platform to simplify the debugging process for location-related Carplay applications. Populated with plugins like the fake location generator, virtual driving dashboards, and joystick control driver with the Gaode Map SDK and Android Location APIs.
- **Stack-structured L-Tage Branch Predictor** Ann Arbor, MI
  Research Assistant | CADRE Lab *Jun. 2017 - Feb. 2018*
  - Developed and validated a novel stack-based branch predictor inherited from L-Tage exploiting the computer architecture research platform (*gem5*). Achieved an average 3 % boosts with the SPEC2006 test suit in KIPS.

Selected Projects

- **Game Design: *Ultimate Opera Fight*** *Oct. 2018 – Dec. 2018*
  Developed, play-tested, and released a multiplayer, first-person, rhythm shooting game with Unity3D (C#) for the campus symposium. Managed and collaborated using Gantt charts and real-time dashboards. Polished the game iteratively with feedback from project milestones using the Agile methodology.
- **Data Analysis on Musical Styles and Artist Popularity** *Jun. 2018 Aug. 2018*
  Structured, cleaned, and performed regression analysis on the 280GB Million Song Dataset within a 4-node HDFS cluster to study correlations among musical style, artist fame and geometric locations. Wrote a customized storage plugin in Java for Apache Drill to extract data from `.btf` raw format.
- **Full-Stack Development: *Insta485*** *Jan. 2018 – Apr. 2018*
  Developed a real-time photo sharing website with ReactJS, JQuery, Bootstrap, SQLite and Flask framework. Implemented front-end with React and NodeJS packages (`infinite-scroll`). Designed the ER-diagram and persisted user data with the SQLite database. Automated system deployment with Swarm on AWS EC2 instances.
- **Deep Dive in Operating Systems** *Jan. 2018 – Apr. 2018*
  Implemented from scratch a multithreading library (`mutex` and `cv`), a paging memory management systems, and a multiuser, tree-structured, remote file system using sockets and POSIX threads. Passed 100% test cases.
- **Embedding System Design: *Wanmei Package Sorting Robot*** *Oct. 2017 – Dec. 2017*
  Built a package sorting robot with an Arm Cortex-M3 processor (SmartFusion FPGA) to increase the efficiency by automating the package delivery system. Enabled UART communications among peripherals like motors (a conveyor belt and a bridge crane), LCDs and a camera. Won best project award.

Tech Stack

Languages: Proficient in Python, C, C++, Javascript, SQL and Java. Familiar with MATLAB, R, Ruby and C#.
Frameworks: PyTorch, Caffe, ROS, Android, Flask, Jinja, ReactJS, Electron, `npm`, Bootstrap, JQuery, Rails.
DevOps: Docker, Swarm, AWS, Git and Unix Bash.