Fang Han

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I have received Computer Science bachelor's degrees in December 2018. I am a quick learner and have a strong foundation on algorithm designs, operating systems, networks and web systems. Currently, I am actively seeking software engineering positions and research opportunities.

Education

- **University of Michigan** Ann Arbor, MI
  Computer Science B.S.E 3.86/4.00 *Sept. 2016 – Dec. 2018*
  - All semesters University Honors & Dean's List
  - Game Design Project:
    - Recreate Zelda NES version using Unity in C# together with a customized level individually
    - Develop a rhythm shooter game: *Ultimate Opera Fight*
  - Computer Architecture Capstone Design Project: Design and Implement a 3-way-superscalar R10k pipeline microprocessor using System Verilog. Validate and synthesize the microprocessor architecture

- **UM-SJTU Joint Institute at Shanghai Jiao Tong University** Shanghai, China
  Electrical and Computer Engineering B.S.E 3.60/4.00 *Sept. 2014 – Aug. 2018*
  - Outstanding Undergraduate Scholarship & Dean's List
  - Software Capstone Design: *Vehicle Simulation Platform On Android* provides the in-vehicle software developers with handy utilities such as dashboard display panels, mock location providers and other operational interfaces

Research Experience

- **Attack Lidar using EMI** Ann Arbor, MI
  SPQR Lab Assistant *Jan. 2019 - Present*
  - Visualize point clouds in threejs to analyze the effect of electromagnetic interference on Lidar
  - Propose adversarial machine learning attack methods against Apollo CNN segmentation model
  - Expose the vulnerability of Apollo CNN model under certain electromagnetic interference, as validated in the software level

- **Edge Computing Research** Ann Arbor, MI
  System Lab Assistant *Sept. 2018 - Present*
  - Implement a remote computation architecture for augmented windshield display and facial recognition
  - Apply the idea of edge computing to stateful applications and evaluate their network performance in terms of latency. Reduce the overhead in cross-nodes data migration using previsioning

- **Stack-structured L-Tage Branch Predictor** Ann Arbor, MI
  Computer Architecture Research Assistant *Jun. 2017 - Feb. 2018*
  - Write gem5 C++ source code of a stack-structured branch predictor inherited from L-Tage
  - Validate different implementations and evaluate the performance in terms of prediction correct rates and instructions per second. Obtain a 3% performance boost when the new structure is enabled in certain program counters
  - Tackle technical and programming problems for research lab-mates

Projects

- **Distributed Computing & Data Mining** Shanghai, China
  Million Song Dataset Analysis *Jun. 2018 – Sept. 2018*
  - Exploit open-source distributed computing (Apache™ Hadoop) to analyse the entire 280GB dataset
  - Extract the data in `.btf` by a customized storage plugin for Drill
  - Apply data analysis on the artist locations and music style. Document the findings in LaTeX

  : R Studio, Hadoop Ecosystem, Data Visualization, LaTeX

- **Web Systems** Ann Arbor, MI
  Insta485 Website Development *Jan. 2018 – Apr. 2018*
  Recreate the dynamic Instagram website passing all test cases, including:
  - Sqlite3 as user database. Flask for the server-side framework which maintains user sessions and handles different requests such as manage accounts and post photos
  - React for the client side framework to manage states for each web component. Other `npm` packages `infinite-scroll` to provider users with more seamless experience
  - A search engine for article Wiki, ranked on tf-idf. The index was calculated using parallelized mapreduce algorithm, supported by Hadoop streaming

  ⚙: JetBrain Webstorm, Python3, Flask, React, Hadoop MR Streaming, `npm`

- **Operating Systems** Ann Arbor, MI
  Thread Library, Pager, File Systems *Jan. 2018 – Apr. 2018*
  Implement operating system kernel and pass all test cases, including:
  - Multithreading library above the provided hardware interface
  - OS pager for memory management
  - Multiple-user, tree-structured and remote-accessible file system

  ⚙: GNU Thread Library, Sockets, C++

- **Embedded Systems Design** Ann Arbor, MI
  Package Sorting Robot *Sept. 2017 – Dec. 2017*
  Build a package sorting robot within a 4-member team, featured in:
  - High efficiency and accuracy of packages classification compared with traditional human sorting process
  - Automatic processing pipeline including delivering (conveyor belt), sorting (camera color detection and object classification), packing (bridge crane and controller) and monitoring (LCD display)

  ⚙: SmartFusion FPGA, Fault Tolerant Algorithm Design, UART Protocol Programming

Courses

Database Management System	Computer Networks	Computer Game Design
Methods and Tools for Big Data	Intro to Cryptography	Intro to Operating Systems
Web Systems	Intro to Machine Learning	Embedded Systems
Data Structures & Algorithms	Computer Architecture & VLSI Design	Digital Signal Processing

›_Skills

- **Generals**: Independent Research, Software Programming, Teamwork, Techical Communication
- **Languages**:
  - $\geq$ 10000 lines: Java, C/C++, Python, C#, HTML, System Verilog
  - $\geq$ 1000 lines: Javascript, R, SQL, Matlab
  - Familiar with: Bash, Mathematica
- **Technologies & Softwares**: Unix, Hadoop ecosystem (Mapreduce, Drill, Spark, Avro), React, Flask, Android Studio,Unity, FPGA Programming, LaTeX, Git, OpenCV, TensorFlow, Sklearn, gem5

Languages & Interests

- Fully proficient in English technical communication and a Madarin native speaker
- Interested in game design and looking for Unity game-dev fellows to cooperate
- Skillful in Go(Weiqi) and badminton