

# Zehao (Zach) Guan

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## EDUCATION

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### Carnegie Mellon University

*M.S. in Artificial Intelligence and Innovation, School of Computer Science, GPA: 3.83/4.0*

Pittsburgh, PA

May 2020

### Zhejiang University

*B.E. in Information Engineering, School of Information and Electronic Engineering, GPA: 3.76/4.0*

Hangzhou, China

Jun. 2018

## SKILLS

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**Coursework:** Distributed Systems, Practical Data Science, Scalable Machine Learning, Natural Language Processing(TA), Deep Learning, Machine Learning, Text Mining, AI Engineering, Intro to Computer Systems, Database Systems.

**Languages:** Python(various data science libraries), Java, C/C++, JavaScript, SQL, Scala, Assembly.

**Tools:** Linux, Git, AWS, K8s, MySQL, MongoDB, Hive, MapReduce, HDFS, Spark, TensorFlow, PyTorch, MATLAB.

## EXPERIENCE

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### Walmart Labs

Sunnyvale, CA

*Machine Learning Engineer Intern, Personalization Team*

May 2019 – Aug. 2019

- Designed a personalized recommender for implicit data, and developed latent factor model based collaborative filtering, including pointwise/pairwise non-negative matrix factorization and factorization machine methods.
- Aggregated million-scale Walmart.com transaction data by Hive, extracted and preprocessed raw data with PySpark.
- Visualized insights from sampled data by Tableau and utilized t-SNE and K-means to analyze latent representations.
- Applied ranking information retrieval metrics such as Hit Ratio, Mean Average Precision and Normalized Discounted Cumulative Gain in Python for graded relevance evaluation based on the customers preference.

### University of Michigan

Ann Arbor, MI

*Research Assistant, Electronic Engineering and Computer Science Dept.*

Jul. 2017 – Oct. 2017

- Developed a prototype system integrated with wearable sensors and remote monitor display for U-M athletic swimmers.
- Assembled varied sensors, Bluetooth module and micro-controller on Arduino by C++ to collect real-time detected biometric data, and utilized Eagle to redesign schematics and circuit layouts to improve communication efficiency.
- Designed Android App to receive transmitted data and multi-thread programs to establish synchronous connections.

### Nokia Siemens Networks Co., Ltd.

Hangzhou, China

*Software Engineer Intern*

Aug. 2016 – Nov. 2016

- Implemented image processing, segmentation and feature extraction by OpenCV in Python, and applied CNNs based model to build a human face recognition system in TensorFlow.
- Embedded the framework in Raspberry Pi with JSON-based front-end display interface to complete a human-machine interactive demo, which is capable of pushing customized information of recognized targets.
- Created an open source platform for mobile development on IoT and succeeded in application for Utility Model Patent.

## SELECTED PROJECTS

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### Speech-to-Text Transcription System

Feb. 2019 – Apr. 2019

- Developed Attention-based deep neural networks in PyTorch, with a combination of RNNs, CNNs and Dense Nets to design an End-to-End system for speech utterance to corresponding text transcription.
- Evaluated on WSJ dataset with the Levenshtein distance and perplexity, and ranked top 5% on Kaggle leaderboard.

### Question Generation & Answering System

Sept. 2018 – Nov. 2018

- Designed a QA system to generate/answer questions from the source of Wikipedia articles based on linguistic features.
- Applied sentence segmentation, Porter stemming and tokenization by spaCy, parsed POS taggers and NER recognition by dependency tree, transformed declarative sentences to ranked binary/WH questions.
- Utilized scikit-learn to preprocess and vectorize input sentences, identified question types and coreference resolution, calculated Jaccard similarity and TF-IDF relevance to select top candidates for answering.

### Intro to Computer Systems Labs

May 2018 – Aug. 2018

- Wrote a general-purpose cache simulator, and optimized a small matrix transpose kernel to minimize number of misses.
- Realized a simple Unix shell that supports basic commands of job control and implemented I/O redirection.
- Implemented a dynamic memory allocator by designing segregated free list and manipulating bits in header/footer with LIFO and best-fit policy, to improve both space utilization and throughput.
- Built a concurrent HTTP proxy that caches recently accessed web objects to handle multiple client requests in parallel.