

JIAYI GUAN

(+1) 412-759-2897 | jiyig@andrew.cmu.edu | Pittsburgh, PA 15213

EDUCATION

Carnegie Mellon University, Heinz College

Master of Information Systems Management, 3.74 / 4.0

Coursework: Cloud Computing, Distributed System, Machine Learning, Deep Learning, Computer Vision, Data Structure

Pittsburgh, PA

Sep. 2021 - Dec. 2022

East China University of Science and Technology

Bachelor of Economics, Major in Finance, 3.72 / 4.0

Coursework: Stochastic Process, Numerical Analysis, Probability & Mathematical Statistics

Shanghai, China

Sep. 2015 - Jul. 2019

RESEARCH

Fine-Grained Visual Recognition

Dec. 2021 - Feb. 2022

Research Assistant in ECE Department, CMU

- Experimented ViT, MLP-Mixer, ResMLP and ResNet models on CUB2011 Dataset and analyzed the importance of patch embeddings on fine-grained visual recognition.
- Participated in building a multiprocessing deep learning pipeline, supporting different datasets, models and keeping track of best results automatically.

Acoustic based Intent Recognition for Low Resource Languages

Sep. 2021 - Dec. 2021

Research Assistant in ECE Department, CMU

- Proposed a Spoken Dialogue System for low resource languages with universal phones. Built both Transformer and CNN+LSTM based architecture and verified the system could outperform character-based intent recognition systems by approximately 20% as the amount of data reduces, while maintaining comparable performance for large datasets.

WORK EXPERIENCE

Scishang Data Technology

Shanghai, China

Machine Learning Engineer

Jul. 2019 - May 2020

- Preprocessed the historical customer traffic data with Bayesian Online Changepoint Detection. Predicted the customer traffic using LightGBM with a 93.5% accuracy and provided rent guidance for shopping malls.
- Evaluated the effectiveness of shopping mall campaigns based on the customer traffic prediction model and SHAP method and helped 100 malls achieve an approximate 3% average increase on ROI.

PROJECT

Twitter Analytics Web Service

Feb. 2022 - Current

- Developed a high-performance web server with Jooby and deployed it with self-managed Kubernetes cluster to handle a high load.
- Implemented extracting, transforming and loading (ETL) on a large data set (~1 TB) of raw twitter data with Apache Spark and MySQL and HBase as data store. Optimized HBase by designing rowkey/schema design, region split and table/cluster configuration tuning and frontend query.

Moving Object Detection and Tracking Based on Lucas-Kanade

Feb. 2022 - Feb. 2022

- Built an object tracking model with template correction based on Lucas-Kanade and improved the computational efficiency by applying Inverse Composition.
- Used dominant motion subtraction to detect moving objects.

Real-time Augmented Reality Based on Planar Homography

Feb. 2022 - Feb. 2022

- Built a real-time augmented reality project that renders video on the moving book cover. Applied Oriented FAST and Rotated BRIEF, SIFT detector and descriptors to find key points and match corresponding point between two images. Computed planar homography with normalization and warped video into the book cover.

End-to-End Speech to Text Transcription

Nov. 2021 - Dec. 2021

- Trained a Listen, Attend, Spell (LAS) model for character-based transcription of speech data, based on pyramidal binary LSTM (pBLSTM) encoder, dot-product attention, teacher forcing and LSTM decoder.
- Applied multi-head attention mechanism, self-ensemble, locked dropout, weight tying, activation regularization and Gumbel noise to improve performance, making evaluation metric, Levenshtein mean, attain 20.

RELEVANT SKILLS

- **Programming Languages:** Python, Java, C++, SQL, NoSQL, Shell, Scala, R, MATLAB, LaTeX
- **Database & Big Data:** MySQL, HBase, Neo4j, MongoDB, Hadoop, Spark
- **Framework & Tools:** Docker, Kubernetes, Linux, Git, Node.js, Vue.js, Spring, Django, Flask, Jooby