Shangquan Sun

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EDUCATION

University of Michigan Sept. 2019 - May. 2021 (expected)
M.S. in Data Science GPA: 4.0/4.0
Coursework: Machine Learning, Database Management Systems, Deep Learning for CV, NLP with Deep Learning, Information Retrieval, Computational Modeling in HCI, Systems for AI, Computational Machine Learning & Data Science

University of Michigan - Shanghai Jiao Tong University Joint Institute Sept. 2015 - Aug. 2019
B.S. in Electrical and Computer Engineering Major GPA: 3.6/4.0
Coursework: Data Structures, Algorithms, Operating Systems, Machine Learning, Data Mining, Computer Organization

AREAS OF INTEREST

Computer Science, Data Science, Data Mining, Computer Engineering

SELECTED PROJECTS

Detail-Preserving Image-based Virtual Try-On Network with Patch GAN Sept. 2019 - Dec. 2019
Awarded as Silver Prize in EECS 545 Machine Learning of Fall 2019 at University of Michigan

- Did thorough literature review in the area of image-based virtual try-on system and human parsing models
- Retrained CP-VTON (Toward Characteristic-Preserving Image-based Virtual Try-On Network) as our baseline
- Replaced the human parsing method of CP-VTON to a state-of-the-art method, Graphonomy, in the image preprocessing stage before geometric matching module and got a more accurate and precise pose mask and body keypoints
- Added a patch-wise local discriminator to preserve the details of cloth images, e.g. cuffs and collar.
- Obtained an optimal model by tuning hyper-parameters, which outperformed baseline significantly in well designed human evaluation among 10 participants

Performance Evaluation and Optimization of Recurrent Neural Network Inference on Mobile Devices Jan. 2020 - April. 2020

- Did literature survey about the acceleration of inferencing on (Long Short Term Memory) LSTM model
- Adopted an open-source mobile engine for the inference task of machine learning models on Android virtual device by Gradle build tool and introduced a lightweight LSTM model after the process of quantization onto the platform
- Developed an optimization method of General Matrix Multiplication (GeMM) with the help of GPU acceleration by reusing the data load from memory in the two inner *for* loops and performing element-wise addition for multiple sub-blocks simultaneously
- Experimented on Andoird studio and physical machine and achieved 1.23X acceleration when weight sizes are large

Computational Modeling of the Performance of and Human Behaviour of Apple Touch Bar Sept. 2019 - Dec. 2019

- Developed a computational model of a virtual MacBook QWERTY keyboard with touch bar, simulating human interaction with touch bar while typing based on Fitt's Law and Model Human Processor including perceptual, cognitive and motor operators.
- Designed hierarchical layouts of touch bar and simulated additional time wasted due to error touch on the hierarchical touch bar
- Experimented virtually on our model for the multiple tasks of typing on various layouts of touch bar in PowerPoint
- Validated our model by doing empirical experiments on 15 participants and confirming virtual results matched the empirical results

Citation Prediction with Novel Network Density in Graph Embedding Space Dec. 2019 - Present
Supervised by Shiyan Yan and Prof. Qiaozhu Mei in Foreseer Group

- Proposed a network density metric in geometric space of graph embedding by iteratively updating node density with the weighted average of its *k* closest neighbors in Euclidean distance with weight estimation inherited from t-SNE
- Experimented on simple networks, compared results with baselines of Kernel Density Estimation (KDE) and Adaptive-KDE (AKDE)
- Proved effectiveness of our metric by adding it as an additional feature of regression model to predict future h-index in a citation network

SELECTED ACTIVITIES

Research Assistant, *Ross School of Business, University of Michigan* Sept. 2020 - Present

- Processed Twitter Decahose dataset and detected corrupted datafiles by PySpark on Cavium provided by University of Michigan.
- Filtered Chinese and Japanese users and their tweets and selected those potentially dismissed from work.

Teaching Assistant, *Probabilistic Methods in Engineering* May. 2018 - Aug. 2018

- Compiled and delivered recitation classes weekly, resolving students relevant issues, and graded assignments and exams for 160 students

Chairman, Honor Council at University of Michigan - Shanghai Jiao Tong University Joint Institute Jul. 2018 - Jul. 2019

- Reduced academic misconduct and improved academic integrity by organizing routine investigation and hearing and investigating alleged violation of the Honor Code (HC) at the institute including plagiarisms, academic cheating, etc.

MISCELLANEOUS

Honors Undergraduate Excellent Scholarship (2018)
First Prize of China Odyssey of the Mind in China Division (2016)
Tools PyTorch, RStudio, PySpark, SQLite, LaTeX, Origin, Xilinx, Vim, PCspim, PSPICE
Languages Mandarin (Native speaker), English (TOEFL 108), Japanese (N2), German