Minghe Zhang

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EDUCATION

College of Engineering, Georgia Institute of Technology **Expected May 2019**

Machine Learning PH.D. in Industrial and System Engineering (ISYE)

College of Engineering, Georgia Institute of Technology **Aug 2017-May 2019**

M.S. in Electrical and Computer Engineering, GPA:3.9/4.0

Department of Microelectronics, Tsinghua University (THU), Beijing, China **Aug 2015- Jul 2017**

B.E. in Electronic Engineering, Overall GPA: 89/100 (Rank 5/25)

Department of Electronic Engineering, Tsinghua University (THU), Beijing, China **Aug 2013- Jul 2015**

Overall GPA: 89/100, Major GPA: 91/100 (Rank: Top 15% out of 270+ students)

Department of Electrical Engineering, University of Southern California (USC) **Jun 2016- Sept 2016**

Full-time researcher through the THU&USC summer exchange program; only 8 students selected from Tsinghua University

RESEARCH EXPERIENCES

Data mining and machine learning in vehicle systems | Tsinghua University | Research Assistant Sept 2015 – May 2017

Advisor: Shouyi Yin, professor of Microelectronics, Tsinghua University

- Collected and monitored raw data from sensors on vehicles, and filtered irrelevant data by utilizing the Gaussian filter method
- Used Tensorflow to study different driving styles based on the filtered data, which allowed the software to distinguish whether the car is turning around, accelerating, coasting, etc
- Applied the Binary Neural Network (BNN) methods to Tensorflow to accelerate the study process and computation speed
- Developed a hardware structure of NMS algorithm in image recognition and ran it on FPGA

Retiming of Two-Phase Latch-Based Resilient Circuits | USC | Research Assistant Jun 2016-Sept 2016

Advisor: Peter A. Beerel, professor in Department of Electrical Engineering, USC

- Proposed a new network-simplex-based retiming method, which was used for two phase latch-based resilient circuits, to reduce the overhead of the combination of normal and error detecting latches
- Demonstrated an improved efficiency by using the network-simplex method instead of the traditional min-cut method, and enabled the edges with negative costs in optimal process of retiming for the first time
- Developed testing programs in C++ and Matlab to conduct experiments with ultra-large industry circuits, and demonstrated that our method can reduce an average of 20% on sequential elements costs within 15 minutes even for large industrial circuits, demonstrating the computational efficiency of the approach
- Completed a paper, which got accepted by the Design Automation Conference (DAC 2017)

Node Embedding Method for Graph Alignment | Georgia Tech | Research Assistant Dec 2017- May 2018

Advisor: Ümit V. Çatalyürek, professor in CSE department, Georgia Tech

- Applied node2vec on two similar graphs. Based on their feature representations, categorized nodes into several groups as the preprocessing for graph alignment
- Modified random walk to generate similar feature representations for similar nodes from two graphs, thus improved the accuracy of putting the correct mapping nodes into the same groups

Graph Subspace Tracking for Online Community Change Detection| Georgia Tech | MS Thesis Jul 2018- Dec 2018

Advisor: Yao Xie, professor in ISYE (Industrial and System Engineering) department, Georgia Tech

- Designed a novel subspace tracking approach for learning graphs on grassmann manifolds, which combines spectral clustering with gradient descent on manifolds for the updating process

- Implemented Slope Change Detection as well as multi-segmented change detection to explore the changes of a graph and evaluated Expected Detection Delay (EDD) and Average Run Length (ARL) of the methods

Structural Learning for Hawkes Process Network | Georgia Tech | MS Thesis Dec 2018- May 2019(Expected)

Advisor: Yao Xie, professor in ISYE (Industrial and System Engineering) department, Georgia Tech

- Currently working on deriving the second order statistics for multivariate Hawkes Processes
- Designing algorithms for detecting changes of the Hawkes Processes

PUBLICATION

Hsiao-Lun Wang, **Minghe Zhang**, Peter A. Beerel, "Retiming of Two-Phase Latch-Based Resilient Circuits"

- Published on the Design Automation Conference (DAC 2017), Mar 2017.

H Cheng, HL Wang, **Minghe Zhang**, D Hand, PA Beerel, "Automatic Retiming of Two-Phase Latch-Based Resilient Circuits"

- IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems

COURSE PROJECTS IN GEORGIA TECH

The Hourglass Effect on Evolving Call-graphs **CS 7280 (Network Science)**

- Constructed a tool using python to evaluate the hourglass effect
- Analyzed the difference between different versions of call-graphs based on data from openSSH systems
- Visualized it and analyzed various properties of this dynamic network

The Small-World Property on Several Graph Models **CSE 6010(Computational Problems Solving)**

- Implemented C code to measure the diameter and betweenness centrality of a real network model
- Randomized a network while preserving the degree distribution of the real one
- Compared the difference between the real and randomized network theoretically

A Real Time Chatroom App for Gamers **CS 6250 (Computer Networks)**

- Modified the backend part of the cloud-based chatroom application
- Designed a formula to estimate the benefit of sending partial messages in gaming situations and verified its correctness by comparing theoretical results with experimental results
- Served as the team leader of the project and made schedules and write-up reports

Career Path Recommendation and Visualization **CSE 6242(Data Analytics and Visualization)**

- Proposed and implemented the community detection and career-path recommendation algorithms
- Visualized the refined data using Sankey chart using R language
- Served as the first presenter of the team

INTERNSHIP EXPERIENCE

Machine Learning and Artificial Intelligence Engineer | @ SF Express May 2018- Jul 2018

- Built a recommendation system based on logistic networks between companies
- Implemented change point detection to find out the fluctuation of the employers' salaries
- Used machine learning method to decide whether an added-value insurance is needed for a delivery

SKILLS

Programming: C/C++, java, python, Cuda, Perl, JavaScript, HTML, CSS, Matlab, R, Pspice, LATEX

Office Applications: Microsoft Office, Visio, Photoshop, Auto CAD, Lucid Chart,

STANDARD ENGLISH TESTS

GRE: Verbal - 161 (88^{th} percentile) Quantitative - 170 (97^{th} percentile) Analytical Writing - 4.0

TOEFL: Total 104 (Reading 28, Listening 25, Speaking 22, Writing 29)