Minghe Zhang

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EDUCATION

College of Engineering, Georgia Institute of Technology **May 2019 - Present**

Industrial and Systems Engineering (ISYE) Ph.D. in Machine Learning

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

M.S. in Electrical and Computer Engineering (ECE)

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

Online Community Detection by Sequential Spectral CUSUM | Georgia Tech | June 2019- Present

Advisor: Dr. Yao Xie from Industrial and System Engineering department, Georgia Tech

- Designed a Spectral CUSUM procedure to detect community change in dynamic graphs
- Used a Gaussian model to represent the graph structure, and got the closed-form for the Expected Detection Delay (EDD) and Average Run Length (ARL)
- Submitted a paper to ICASSP 2020, available at arXiv: https://arxiv.org/abs/1910.09083

Change-Point Detection for Hawkes Process | Georgia Tech | April 2019- Present

Advisor: Dr. Yao Xie from ISYE department, Georgia Tech

- Currently working on non-asymptotic properties for Hawkes Process
- Designed algorithms for detecting changes in the Hawkes Processes

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

Advisor: Dr. Yao Xie from ISYE 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

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

Advisor: Dr. Ümit V. Çatalyürek from 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

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

Advisor: Dr. Peter A. Beerel from 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 the 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)

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

Advisor: Dr. Shouyi Yin from department 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

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

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 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)