

# Minghe Zhang

[minghe\\_zhang@gatech.edu](mailto:minghe_zhang@gatech.edu)

Atlanta, GA 30339

## EDUCATION

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**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

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**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)
- Published 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  
2017

Sept 2015 – May

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**

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**Minghe Zhang**, Liyan Xie, Yao Xie, “Online Community Detection by Spectral CUSUM”

- Published on the International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2020), Jan 2020.

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**

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**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**

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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**

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GRE: Verbal - 161 (88<sup>th</sup> percentile) Quantitative - 170 (97<sup>th</sup> percentile) Analytical Writing - 4.0

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