

# Minghe Zhang

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Atlanta, GA 30309

## EDUCATION

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**College of Engineering, Georgia Institute of Technology**

**Expected 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, 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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**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

- Submitted a paper on International Conference on Acoustics, Speech and Signal Processing (ICASSP)

**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 conditional independence for multivariate Hawkes Processes

## **PUBLICATION**

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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

**Minghe Zhang**, Yao Xie, “Graph Subspace Tracking for Online Community Change Detection”

- Submitted to International Conference on Acoustics, Speech and Signal Processing (ICASSP)

## **COURSE PROJECTS IN GEORGIA TECH**

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### **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**

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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 an added-value insurance is needed for a delivery

## **SKILLS**

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Programming: C/C++, java, python, Cuda, Perl, JavaScript, HTML, CSS, Matlab, Verilog HDL, 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)