**Minghe Zhang**

[minghe\_zhang@gatech.edu](mailto:minghe_zhang@gatech.edu) Atlanta, GA 30339

**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 AssistantSept2015 – 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 (88th percentile) Quantitative - 170 (97th percentile) Analytical Writing - 4.0

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