

# Guantao(Chris) Zhao

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## EDUCATION

**Georgia Institute of Technology, Atlanta, GA** (08/2021- Now)

- PhD of Machine learning in Industrial and Systems Engineering

**The George Washington University, Washington, D.C.** (08/2018- 05/2020)

- Master of Science in Computer Science,

**Rutgers University-New Brunswick, NJ** (09/2015 - 05/2018)

- Bachelor of Science in Mathematics & Bachelor of Arts in Computer Science,

**Drexel University, Philadelphia, PA** (09/2013 - 06/2015)

- Bachelor of Science in Mathematics,

## PUBLICATION

- **G. T. Zhao, Y. N. Sun, Z. Q. Zhu and A. Arora., Matching Algorithms in Ride Hailing Platforms.** SAI Future Technologies Conference 2020 (FTC 2020), Volume 2 pp 847-861.
- **G. T. Zhao, Z. Q. Zhu, Y. N. Sun and A. Arora., Pairwise Cosine Similarity of Emission Probability Matrix as an Indicator of Prediction Accuracy of Viterbi Algorithm.** ICAART 2021.

## RESEARCH EXPERIENCE

**Graduate Research Assistant, H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology**

Advisor: Dr. Nicoleta Serban (05/2022 – Now)

- **Opioid Utilization After Trauma Hospitalization:** Extracted complex medical data by SQL; Designed regression models and simulated the national populations to estimate opioid utilization.
- **Reinforcement Learning of Simplex Pivot Selection:** Working on a new reinforcement learning model to improve the efficiency of the Simplex Algorithm in solving Linear Programming Problems and the TSP problem.

**Graduate Research Assistant, Coulter Department of Biomedical Engineering, Georgia Institute of Technology**

Advisor: Dr. Peng Qiu (08/2021 – 12/2021)

- **Pediatric COVID-19 Data Challenge:** Implemented and optimized training model XGBoost for tasks. Proposed SHAP to improve and explain the performance of the model.
- **Single-Cell RNA Sequencing Data:** Designed new computational Doublet-Detection methods for Single-Cell RNA Sequencing Data.

**Research Assistant & Team Leader, The George Washington University**

Advisor: Dr. Amrinder Arora (08/2020 – 01/2021)

- **Correlation of Emission Probability vs. Prediction Accuracy of MLE:** Led two team members to complete this project and worked as the first author to publish a paper; Implemented the Hidden Markov model and Viterbi algorithm; Proposed accuracy can be expressed as a closed-form expression of the model (the underlying HMM) itself; Verified a novel way for the prediction accuracy of Viterbi algorithm is governed by the arithmetic mean of the cosines of the emission probabilities.

**Research Assistant & Team Leader, The George Washington University**

Advisor: Dr. Amrinder Arora (10/2019-06/2020)

- **Matching Algorithms in Ride Hailing Platforms:** Explored the complexity in defining a meaningful objective itself, and proposed a family of routing, automatic driving and ride-sharing algorithms; Approached the problem

of routing the cars to the passengers in an optimal fashion from the perspective of the ride sharing operator; Led two team members to complete this project and worked as the first author to publish a paper.

**Directed Program Undergraduate Research**, Rutgers Math Department, New Brunswick, NJ

Advisor: Dr. Jinyong Park

(09/2017 -01/2018)

*Project: Research of the Use of Graph Theory in Car-sharing Software (Uber, DiDi, Lyft)*

- **Student Researcher:** Learned the Graph Theory independently and mastered the relevant algorithm, LaTeX and Matlab; Made the presentation in the conference of Directed Program Undergraduate Research in Rutgers and won 2018 Excellent Student Research Project; successfully shortened the waiting time of passenger and increased the order receiving rates of drivers.

**TEACHING ASSISTANT EXPERIENCE - On Campus**

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**Graduate Teaching Assistant**, Georgia Institute of Technology, Atlanta, GA.

(01/2022-Now)

- Fall 2022: ISyE 6402 - Time Series Analysis
- Spring 2022: AE 2220 & AE2221 - Dynamics

**TA & Grader**, The George Washington University, Washington, D.C.

(08/2019-05/2020)

- Focused on Computer Science Course CS4455 of Master program.
- Helped over 100 students with test preparation and assignments.

**Math Tutor**, Drexel University, Philadelphia, PA

(09/2014-05/2015)

- Helped students with test preparation and homework assignments in *Algebra, Calculus, Trigonometry and Statistics*.

**Math Tutor Volunteer**, Old Pine Community Center, Philadelphia, PA

(01/2014-06/2014)

- Taught high school students at a community center focusing on Algebra, SAT test preparation, and Geometry.

**WORK EXPERIENCE**

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**BrainCo**, Boston, MA

(08/2020-06/2021)

- **Software Engineer & Researcher, Full time:** Focused on robot's gyroscope data processing work by PyQt GUI; Involving in the development of a robotic arm that combines Electromyography and Deep Learning to help disabled people use the prosthetics that we have designed; Implemented a gesture recognition system to predict disabled people gestures based on time-sequence data and focused on the problem of overlapping gestures with EMG signals.

**Blue Otter**, The Mountain View, CA

(06/2017-09/2017)

- **Software Tester, Intern:** Focused on testing the backend of a behavioral analytic data science tool; Developed Python automated test cases testing database resilience, SQL queries and targeted deletes, and frontend use cases.

**Tsinghua Tongfang Co., Ltd.**, Beijing, China

(06/2016-09/2016)

- **Web Programmer, Intern:** Designed the web of the new product based on HTML, CSS and Javascript; Completed web maintenance.

**AWARD & HONOR**

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- **2020 Graduate Merit Awards & \$4000 Tuition Fellowship**- The George Washington University
- **2019 Graduate Merit Awards & \$4000 Tuition Fellowship**- The George Washington University
- **2019 The George Washington University's Golden Key International Honour Society Member**
- **2018 Excellent Research Project**-Directed Program Undergraduate Research
- **2017 Dean's List** in Art and Science Department- Rutgers University
- **2015 Dean's List** in Art and Science Department- Drexel University
- **2013 Recipient of \$10,000 per year** academically based scholarship for two consecutive years-Drexel University

## SKILL & LANGUAGE

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- Java, WebGL, Python, C++, C, GO
- MATLAB, LaTeX, HTML5
- SQL, Assembly, CSS, Javascript