Tianchi "Maverick" Mo

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Education

❖ **Stony Brook University** (USA), Ph.D. in Computer Science ⟶ Aug. 2018 - Aug. 2025
- **Advisor:** Michael A. Bender.
- **Thesis:** *Theoretical and Experimental Studies on Strongly Adaptive Filters and Parallel Paging.*
- **GPA:** 4.0/4.0.
- **Coursework:** Data Science Fundamentals, Analysis of Algorithms, Machine Learning, Theory of Database Systems, and Computational Geometry.

❖ **Central South University** (China), Master in Software Engineering ⟶ Sep. 2014 - Jun. 2017
- **GPA:** 3.9/4.0.

❖ **Central South University** (China), Bachelor in Software Engineering ⟶ Sep. 2010 - Jun. 2014
- **GPA:** 91/100.

Research Experience

❖ **Ph.D. Research Assistant**, Stony Brook University ⟶ Jan. 2020 - Aug. 2025
- Collaborating with my advisor, lab colleagues, and other researchers from Rutgers University, Berkeley Lab, and the University of Padova (Italy) on research projects about adaptive data structures, caching and paging algorithms, heuristic algorithms, and machine-learning-advised algorithms.

❖ **Graduate Research Group Leader**, Central South University ⟶ Oct. 2014 - Oct. 2016
- Led a group of four master students and one undergraduate to study social network data mining.

❖ **Undergraduate Research Group Leader**, Central South University ⟶ Oct. 2011 - Jun. 2014
- Led a group of five undergraduates to study automatic resume generation.
- Led another group of four undergraduates to explore optimizing search engines with social network data.

Research Projects

❖ **Machine-learning-advised/Heuristic Paging Algorithm** ⟶ Jan. 2022 - Present
- *This is a project for my Ph.D. degree. We aim to more optimally manage RAM under high contention, such as when there are many parallel processes.*
- Modern operating systems may perform poorly when multiple processes running in parallel compete for fast memory like RAM. Meanwhile, the green paging algorithm aims at reducing the energy consumption of a *single* process through optimizing memory allocation. This project focuses on utilizing machine-learning advising and heuristic algorithms to create a green paging algorithm with good average-case performance and a worst-case guarantee, which can be further applied to a parallel paging algorithm to shorten the completion time of processes running in parallel.

❖ **Autoethnography Project** ⟶ Jan. 2025 - Present
- *This is an HCI experience report project, aiming at recording and analyzing how I, as a person with cerebral palsy (CP), use assistive technology and other computer technologies to support my life and communicate with people.*
- There is a notable absence of formal autoethnographic research exploring the lived experiences of people with CP. With a structured, questionnaire-based diary method and thematic analysis, this project reveals four key findings: (1) a person with CP can demonstrate resilience through technical proficiency and creative adaptations of mainstream technologies; (2) invisible labor can make using assistive technology painful; (3) communication challenges can complicate the accessibility to community support; and (4) a CP person's reliance on both care and technology exposes fragile interdependencies. We further discuss the importance of reducing input exertion for people with CP and recognize the unanticipated benefits of non-assistive technologies. (Paper: [1])

❖ **Adaptive Filter: Analysis and Implementation**   Feb. 2020 - Dec. 2024

- *This is a project for my Ph.D. degree. We established theoretical bounds and performed an experimental analysis for the adaptive filters.*
- The filter is an approximate dictionary data structure designed to block negative queries (i.e., queries whose keys do not exist in the system). The filter is widely used in many computational systems in order to increase their running speed, including browsers, database systems, AI servers, bioinformatical systems, etc. Filters can have false positives. This project (1) established mathematical bounds of false-positive rates of filters with strong adaptivity (e.g., the broom filter and the telescoping adaptive filter) and filters with a cache of recent false positives, (2) designed encoding strategies for strongly adaptive filters and implemented the broom filter and the cache-augmented filter with C++, and (3) experimentally compared the strongly adaptive filters and the cache-augmented filter with the standard (nonadaptive) quotient filter and adaptive cuckoo filters. (Papers: [2], [3])

❖ **The Edge Prediction Model Based on Clustering Hot Vertices in Social Networks**   Oct. 2014 - Oct. 2016

- *This is an Independent Exploration Project for Graduate Students at Central South University. I was the research group leader.*
- We utilized clusters of hot vertices (i.e., vertices with high in-degree) as features to describe users' interest in social networks, which allowed the recommendation system to make edge predictions ("recommend to follow") with better accuracy and high efficiency.

❖ **Optimizing Search Engines with Social Network Data**   Oct. 2012 - Jun. 2014

- *This is a China National Innovation Training Project for University Students. I was the research group leader.*
- We aimed to combine search engines with social networks in order to customize and optimize the search engine by analyzing users' preferences and behavior patterns exhibited in social networks. (Papers: [4], [5], [6])

❖ **Automatic Resume Generation Based on Semantic Analysis**   Oct. 2011 - Aug. 2013

- *This is a MiTaEr (米塔尔) Innovative Scientific Research Project for Students at Central South University. I was the research group leader.*
- We aimed to design a software system with which people could use the data they already have to create new resumes automatically. (Paper: [7])

Course Projects

❖ **Generating Anime Faces with GANs**   Nov. 2019 - Dec. 2019

- *This is a project of the graduate Machine Learning course. This project earned me an A in this course.*
- Implemented DC-GAN and W-GAN with PyTorch to generate anime faces, explored parameter tuning of deep neural networks, and deployed a Progressive Growing GAN (PG-GAN) on Amazon Web Services (AWS) to generate better-quality anime faces.

❖ **Analyzing the Pop Songs Lifespan**   Nov. 2018 - Dec. 2018

- *This is a project of the graduate Data Science Fundamental course. This project earned me an A in this course.*
- We collected the data of 25K songs from different sources (including Billboard and Spotify) for analysis. We performed feature engineering and applied LightGBM to analyze what properties (e.g., singers, awards, lyrics, themes, and genres) could make music's popularity endure. We also applied Python tools (e.g., Pandas, JSON, Matplotlib, and Seaborn) to visualize our results.

Tech Experience

❖ **Data Analyst**, Online training   Sep. 2023 - Oct. 2023

- Completed a training program on data visualizations for Tata Consultancy Services.
- Created visuals of revenue/geographic/website log data analysis with Microsoft PowerBI to help senior entrepreneur leadership (e.g., CEO and CMO) get valuable information from different angles and make effective decisions.
- See the certificate here.

❖ **Leader of A Website Developing Team**, Freelance   Aug. 2012 - May. 2013

- Led a freelance team of seven students in developing two management websites for the School of Economy and Management of Changsha University of Science and Technology.
- Utilized Java, Microsoft SQL Server, Apache Struts 2 + Spring + Hibernate, HTML, and JavaScript to build the websites from scratch. Wrote around 30K lines of code.
- Communicated with the clients weekly to collect the requirements and keep them updated.

Teaching Experience

❖ **Teaching Assistant**, Stony Brook University, CSE 385 Analysis of Algorithms: Honors   Jan. 2025 - May. 2025
❖ **Teaching Assistant**, Stony Brook University, CSE 548/AMS 542 Analysis of Algorithms   Aug. 2024 - Dec. 2024
❖ **Teaching Assistant**, Stony Brook University, CSE 373 Analysis of Algorithms   Jan. 2024 - May. 2024
❖ **Teaching Assistant**, Stony Brook University, CSE 548/AMS 542 Analysis of Algorithms   Aug. 2023 - Dec. 2023
❖ **Teaching Assistant**, Stony Brook University, CSE 216 Programming Abstractions   Jan. 2023 - May. 2023
❖ **Teaching Assistant**, Stony Brook University, CSE 150 Fdn of Computer Science: Honors   Aug. 2019 - Dec. 2019
❖ **Teaching Assistant**, Stony Brook University, CSE 216 Programming Abstractions   Jan. 2019 - May. 2019
❖ **Head Teaching Assistant**, Stony Brook University, CSE 373 Analysis of Algorithms   Aug. 2018 - Dec. 2018
❖ **Freelance English Teacher**, teaching TOEFL/IELTS/GRE/CET6   Oct. 2016 - Jul. 2018

Publications

[1] **Tianchi "Maverick" Mo**, Humphrey Curtis, Timothy Neate. "Life as an International Computer Science PhD Student with Cerebral Palsy". ASSETS. 2025.

[2] An anonymous journal paper under review. 2025.

[3] Michael A. Bender, Rathish Das, Martín Farach-Colton, **Tianchi Mo**, David Tench, and Michael Wang *(This is a theory paper. Authors were sorted alphabetically. I am the corresponding author and presenter)*. "Mitigating False Positives in Filters: to Adapt or to Cache?." In *Symposium on Algorithmic Principles of Computer Systems (APOCS)*, pp. 16-24. Society for Industrial and Applied Mathematics, 2021. [My presentation]

[4] Hongxiao Fei[1], **Tianchi Mo**, Yang Wang, Zequan Wu, Yihuan Liu, and Li Kuang. "The Searching Ranking Model Based on the Sharing and Recommending Mechanism of Social Network." In *Advances in Services Computing: 9th Asia-Pacific Services Computing Conference, APSCC 2015, Bangkok, Thailand, December 7-9, 2015, Proceedings 9*, pp. 222-234. Springer International Publishing, 2015.

[5] **Tianchi Mo**, Hongxiao Fei, Li Kuang, and Qifei Qin. "Identifying Users' Interest Similarity Based on Clustering Hot Vertices in Social Networks." In *2014 Asia-Pacific Services Computing Conference*, pp. 170-176. IEEE, 2014.

[6] Hongxiao Fei, **Tianchi Mo**, Qifei Qin, Gang Wang, Chengqi He, and Shuo Wei. "The Research of Applying Social Networking Mechanism to Search Engine: A Survey (社交网络相关机制应用于搜索引擎的研究综述)." In *Computing Technology and Automation*. 2014.

[7] Hongxiao Fei, **Tianchi Mo**, Qing Lin, Yanqun Yang, Yeqing Tan, and Xingjun Yan. "Chinese Short Sentence Similarity Calculation Based on Tree-Structure Corpus (基于树状语料库的中文短语相似度计算)." In *Computer Applications and Software, 30(8)*, pp. 18-21. 2013.

Honors, Awards, and Scholarships

❖ **Outstanding University Student with Disability** (11 students in China), by China Disabled Persons' Fedn   2017
❖ **Central South University, Railway Campus Scholarship** (Top 1% of grad students at Railway Campus)   2016
❖ **Ten Outstanding Youths of Central South University**   2015
❖ **National Graduate Student Scholarship** (Top 1% of graduate students at Central South University)   2014
❖ **National College Students' Service Outsourcing Innovation and Entrepreneurship Competition, 2nd Prize**   2014
❖ **Award for Outstanding University Student** (99 students in China), by China Computer Federation   2013
❖ **National Encouragement Scholarship** (Top 1% of undergrads at Central South University)   2011 & 2013
❖ **Central South University Honor Student** (Top 2.5% of undergrads at Central South University)   2012
❖ **National Scholarship** (Top 1% of undergrads at Central South University)   2012

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[1]The first author is my master's degree advisor. I am the second but primary author. It was traditional in China to let the advisor be the first author. This footnote is applicable to all papers coauthored by Professor Hongxiao Fei and me.