Tianchi (Maverick) Mo

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EDUCATION

Stony Brook University — Stony Brook, NY
Ph.D. in Computer Science | GPA: 4.0 — December 2024 or June 2025
Relevant Courses: Data Science Fundamentals, Analysis of Algorithms, Machine Learning, Theory of Database Systems, and Computational Geometry.

Central South University — Changsha, China
Master of Engineering in Software Engineering | GPA:3.9 — June 2017

Central South University — Changsha, China
Bachelor of Engineering in Software Engineering | GPA:91/100 — June 2014

SKILLS

Programming Language: Python, Java, C, C++, MATLAB, SQL, Shell, OCaml.
Computer Science: Pure and Applied Algorithms, Data Structures, Cache and Storage Systems, Database Systems, Linux, and Machine Learning (e.g., PyTorch and XGBoost).

WORKING EXPERIENCE

Department of Computer Science | Stony Brook University — Stony Brook, NY
Graduate Assistant — January 2024 - Present
Research Assistant — January 2020 - December 2022

- Collaborating with Professor Michael A. Bender, lab mates, and other collaborators worldwide on various projects on adaptive data structures, cache and paging algorithms, and machine-learning-advised algorithms. Please refer to the PROJECTS section for more information.

Department of Computer Science | Stony Brook University — Stony Brook, NY
Teaching Assistant — January 2023 - December 2023
Teaching Assistant — August 2018 - December 2019

- Assisted in teaching undergraduate-level courses (Analysis of Algorithms, Programming Abstractions, and Foundations of Computer Science (Honors)) and a graduate course (Analysis of Algorithms).
- Designed assignments and exams to improve students' ability to solve problems and inspire their creativity.
- Created automatic graders in Python & Java to grade students' programming assignments.
- Offered office time (3 hours per week) to help students with questions and deepen their understanding of the course content.

Tata Consultancy Services | Forage Simulation — Online
Data Analyst — September 2023

- Completed a work simulation involving creating data visualizations for Tata Consultancy Services.
- Prepared questions for a meeting with client senior leadership (e.g., CEO and CMO) to make sure they could get enough information from the data visualization from different angles.
- Created visuals for revenue/geographic/website log data analysis with Microsoft PowerBI to help executives make effective decisions.

School of Economy & Management | Changsha Univ of Sci & Tech Changsha, China
Website Developer/Team Leader August 2012 - May 2013

- Led a team of 7 students in developing 2 management websites for the School of Economy & Management of Changsha University of Science & Technology.
- Utilized Java, Microsoft SQL Server, and Apache Struts 2 + Spring + Hibernate to build the websites. Designed the database from scratch. Wrote ~30K lines of code.
- Communicated with the clients weekly to collect the requirements and keep the clients updated.

PROJECTS

Machine-learning-advised/Heuristic Paging Algorithm (research project) January 2022 - Present

- Designed algorithms to apply machine learning techniques to parallel paging and green paging. (Green paging aims to reduce the computer's energy consumption.)
- Designed and performed an initial experiment to test the algorithm with XGBoost's advice.
- Created and implemented a dynamic programming algorithm to find the offline optimal solution for green paging, which could be used in training machine learning models for memory allocation.
- Collected and analyzed the performance data from a Linux server running CPU- and RAM-intensive programs in parallel with Python and Shell scripts.

Adaptive Filter: Analysis and Implementation (research project) September 2020 - Present

- Established mathematical bounds to quantify the performance of 3 kinds of adaptive filters: broom filter, telescoping adaptive filter, and cache-augmented filter. (filter is an approximate dictionary data structure widely used to block negative queries, i.e., queries without results.)
- Implemented the broom filter and the cache-augmented filter with C++ independently. The implementation of the broom filter is the first after it was proposed in theory.
- Compared 5 kinds of adaptive filters experimentally.
- Published a 9-page paper in the 2021 Symposium on Algorithmic Principles of Computer Systems (APOCS). Currently working on a journal version of this paper.

Generating Anime Faces with GANs (course project) November 2019 - December 2019

- Implemented DCGAN and W-GAN with PyTorch to generate anime faces.
- Explored parameter tuning of deep neural networks.
- Deployed a Progressive Growing GAN (PGGAN) on Amazon Web Services (AWS) to generate better-quality anime faces.

Analyzing the Pop Songs Lifespan (course project) November 2018 - December 2018

- Collected data of 25,325 songs from different sources, including Billboard and Spotify, for analysis.
- Performed feature engineering and applied LightGBM to analyze what properties (e.g., singers, awards, themes, and genres) could make music's popularity endure.
- Applied Python tools, e.g., Pandas, JSON, Matplotlib, and Seaborn, to analyze and visualize our results.

PUBLICATIONS

- Michael A. Bender, Rathish Das, Martin Farach-Colton, **Tianchi Mo**, David Tench, Yung Ping Wang. Mitigating False Positives in Filters: to Adapt or to Cache?. Symposium on Algorithmic Principles of Computer Systems (APOCS). 2021. (This is a theoretical paper. Authors were sorted alphabetically. I am the corresponding author and presenter. See my presentation here.)
- Hongxiao Fei, **Tianchi Mo**, Yang Wang, Zequan Wu, Yihuan Liu. The Searching Ranking Model Based on the Sharing and Recommending Mechanism of Social Network. Advances in Services Computing: 9th Asia-Pacific Services Computing Conference. 2015. (The first author is my advisor. I am the second but primary author. It was traditional in China to let the advisor be the first author.)
- **Tianchi Mo**, Hongxiao Fei, Li Kuang, Qifei Qin. Identifying Users' Interest Similarity Based on Clustering Hot Vertices in Social Networks. 8th Asia-Pacific Services Computing Conference. 2014.