Jiacheng Luo

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EDUCATION

Southern University of Science and Technology (SUSTech) — Shenzhen, China

Bachelor of Engineering in Computer Science — *Sep. 2021 – Jun. 2025 (expected)*

- GPA: **_3.84/4.00_** (3.74 ∼ 3.89 ∼ 3.96); Average Score: **_92.39/100_**; Rank: **_22/184_**
- **Relevant Courses:** Calculus (99), Discrete Mathematics (99), Linear Algebra (90), Algorithm Design and Analysis (97), Digital Logic (98), Python (97), Artificial Intelligence (96), Machine Learning (93), Computer Organization (95).

RESEARCH INTERESTS

- **Problem:** How to fully exploit the powerful capabilities of large-scale models in specific fields.
- **Area:** Artificial Intelligence and Machine Learning, primarily focusing on CV and NLP.
- **Field:** Transfer Learning, Domain Adaptation, Parameter-Efficient Fine-Tuning, and Large Model Training.
- **Interdisciplinary:** Utilizing AI and ML in disciplines such as chemistry, biology, mechanics, energy, etc.

PUBLICATIONS

1. Haoquan Li, Chenming Li, Wenjian Huang, **Jiacheng Luo**, Daoan Zhang, Jiebo Luo, Jianguo Zhang "Domain-Regressive Continual Test-Time Adaptation with Orthogonal Low-Rank Adapters" (The paper has been submitted to the 41st International Conference on Machine Learning (**_ICML 2024_**), currently **_under peer review_**)

2. Li Yang, Cong Zhou, **Jiacheng Luo**, Yufan Xiao, Chengyu Zeng "Calculation Method, Device, Medium, and Equipment for Grinding Wheel Fillet Radius" (The invention patent is currently **_undergoing preliminary examination_**)

RESEARCH EXPERIENCE (BY PROJECTS)

Mamba-based Visual Deep Neural Network Model Design — Feb. 2024 — Present

Southern University of Science and Technology (SUSTech) — *Shenzhen, China*

- **_Advisor:_** Prof. Jianguo Zhang
- **_Motivation and Plan:_** Mamba, the latest foundational model architecture post CNN and Transformer, showcases strong performance in NLP and unique advantages in computer vision (VMamba). We aim to leverage CNN and Transformer strengths to enhance Mamba-based visual model performance in downstream tasks.
- **_My Work:_** In my ongoing research, I lead the design of hybrid Mamba-based vision models integrating CNN and Transformer. We'll start by assessing this on CIFAR-100 before scaling up to ImageNet for further exploration.

Domain-Regressive CTTA with Orthogonal Low-Rank Adapters — Jul. 2023 — Feb. 2024

Southern University of Science and Technology (SUSTech) — *Shenzhen, China*

- **_Advisor:_** Prof. Jianguo Zhang
- **_Contribution:_** Achieved state-of-the-art performance in CTTA within both the CNN-based architecture and the Transformer-based architecture, while demonstrating comparable results to classical methods in TTA.
- **_My Work:_** Proposed random masking feature augmentation and RoAD loss to replace the traditional tent loss, achieving data augmentation at minimal additional cost. As a co-author, fully involved in drafting the paper and submitting it to ICML 2024 for peer review.

Calculation Method and Equipment for Grinding Wheel Fillet Radius — Nov. 2023 — Feb. 2024

Southern University of Science and Technology (SUSTech) — *Shenzhen, China*

- **_Advisor:_** Prof. Bi Zhang
- **_Contribution:_** Developed a computational framework for predicting the lifespan of grinding wheels by analyzing 3D point clouds to achieve higher accuracy and faster measurement of the grinding wheel corner radius.
- **_My Work:_** Handled data processing and overall algorithm implementation, proposing specific improvement strategies. Our algorithm is open-sourced at https://github.com/Maystern/WheelRadiusPointCloud, and I am a co-inventor of the patent under review for this project.

MatrixGuard: Secure and Efficient Matrix Operations on ARM and x86 — Feb. 2023 — May. 2023

Southern University of Science and Technology (SUSTech) — *Shenzhen, China*

- **_Advisor:_** Prof. Shiqi Yu
- **_Contribution:_** Developed a memory-safe, high-speed matrix multiplication library optimized for ARM and x86 architectures, achieving the same order of magnitude in speed as OpenBLAS.
- **My Work:** Implemented matrix optimization algorithms in C++, conducted thorough code testing, and compiled results into a technical report. Open-sourced code available at https://github.com/Maystern/MatrixGuard.

Technical Skills

Languages: Python, Java, C/C++, MATLAB, SQL (Postgres) and Verilog
Frameworks: Pytorch
Tools: Linux, Git and LaTeX

Honors and Awards

- *2023* First College Student Algorithm Competition **First Prize (Top 5%)**;
- *2022-2023* 4th National College Student Algorithm Design and Programming Challenge **Gold Award (Top 5%)**;
- *2022-2023* and *2021-2022* SUSTech Outstanding Student Scholarship **First-rate (Top 5%)**;
- *2023* Shuren College Scholar Research Climbing Star Scholarship **(Top 1%)**;
- *2022* and *2023* SUSTech Table Tennis Championships **Gold Medal**;
- *2021* SUSTech Table Tennis Freshman Tournament Man's Singles, **Top 5**.

Campus Work Experience

- **President:** SUSTech Table Tennis Club.
- **Team Leader:** Table Tennis Team of Shuren College 2023.
- **Student Assistant:** CS201 Discrete Mathematics (2023 Fall) and CS205 C/C++ Design (2023 Spring).
- **Participant:** The online volunteer teaching project "Hope in the clouds".