# Mingqian Liao

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## Personal Profile

I am a junior at the Southern University of Science and Technology (SUSTech), majoring in Computer Science and Technology, and studying in the Turing class of my major. I am currently on an exchange program at the University of California, Berkeley, from January to May of this year, during which I took **computer vision, deep learning, machine learning, and operating system**. I am seeking a summer research opportunity in machine learning and reinforce learning area. My goal is to apply my machine learning and reinforce learning skills and knowledge to contribute to cutting-edge research and learn from experts in the field.

I have a strong interest in machine learning and deep learning, and I have been working in our iMED lab since the first semester of my sophomore year to study the application of deep learning to medical imaging. **As a proactive and dedicated researcher, I led my group to achieve A's in both semesters of the research course, which was recognized by the grading professors.** I have also represented the university and achieved good results in the international supercomputing competitions of HPC-AI and ASC22.

My overall GPA is 3.74/4, and my sophomore GPA is 3.83/4 and my junior GPA is 3.94/4. **I earned A and A+ in Machine Learning, Probability and Mathematical Statistics, Software Engineering and Computer Operating Systems, etc.** I have also been a student assistant for two semesters in C/C++ Programming and Computer Networks. My skills include proficiency in programming languages such as Python, Java, and C++, as well as experience in deep learning frameworks such as PyTorch.

## Education

**University of California, Berkeley** — *Berkeley, USA*

Undergraduate — *Jan 2023 - Current*

- **Courses:** Machine Learning, Deep Learning, Graduate Computer Vision, Operating System

**Southern University of Science and Technology** — *Shenzhen, China*

Undergraduate — *Sept 2020 - Current*

- 2nd Prize in SUSTech Excellent Student Scholarship
- Distinguished Student Assistant
- **Courses:** Machine Learning, Artificial Intelligence, Compilers, Operating Systems, Computer Network, Computer Organization, Software Engineering, Data Structure, Probability and Mathematical Statistics, Algorithm Design, C/C++ Program Design, Introduction to Artificial Intelligence

**Zhanjiang NO.2 High School** — *Zhanjiang, China*

High School — *Sept 2017 - June 2020*

- Graduated with Distinction 743/˜400,000
- Specialised in Maths, Physics, Chemistry, and Biology

## Experience

**iMED Lab in Southern University of Science and Technology** — *Shenzhen, China*

Research Student — *Jul 2021 - Current*

- Collaborated with a three-person team on the topic of unsupervised bottom-of-the-eye surgical depth estimation based on microscopic surgical videos

**Student Supercomputing Club of Southern University of Science and Technology** — *Shenzhen, China*

Officer member — *Jan 2022 - Current*

- Organize the university-level supercomputing competitions
- Recruit new students for club
- Select students to represent the university in supercomputing competitions with us

**Southern University of Science and Technology** — *Shenzhen, China*

Student Assistant in CS305 Computer Network course — *Sep 2022 - Feb 2023*

- Checking Lab exercises, and answering questions from students in class and after class
- Designing and grading Assignments for the course

**Southern University of Science and Technology** — *Shenzhen, China*

Student Assistant in CS205 C/C++ Program Design course — *Feb 2022 - Feb 2023*

- Checking Lab exercises, and answering questions from students in class and after class.
- Designing and grading Assignments for the course

## Projects

**Unsupervised Bottom-of-the-eye Surgical Depth Estimation Based on Microscopic Surgical Videos** *Shenzhen, China*

iMED lab in Southern University of Science and Technology *Jan 2022 - Current*

- Build a virtual surgical instrument and fundus database
- Conduct a series of experiments and optimizations to migrate the model in the self-driving depth prediction scene into the surgical scene
- Design a model to output the corresponding depth video from the input fundus surgery video

**Digging deeper into the value of Wordle through time series analysis and natural language processing** *China*

MCM 2023 *Feb 2023*

- Build time series models to explain changes in the number of active Wordel players and predict future trends
- Establish a probabilistic regression model of the distribution of guessing times to analyze the difficulty of Wordle games
- Use clustering algorithms to grade the difficulty of the game, and combine natural language processing techniques to build a classification model from the puzzle to infer the difficulty rating of the game

**Deep-Learning-Based DNA Fast Decoding** *Singapore*

HPC-AI Advisory Council, National Supercomputing Centre (NSCC) Singapore, and National Computational Infrastructure (NCI) Australia *Jan 2022 - Nov 2022*

- Design a model to predict transcription factor's binding site based on the input DNA sequence and DNase-sequence
- Improve the model using the key part of UNet and Leopard and use horovod to train the network distributedly

**Neural Network for self-driving data augmentation** *Shenzhen, China*

Southern University of Science and Technology *Nov 2022 - Jan 2022*

- Augment the automated driving dataset using the Stable Diffusion model as well as the Textual Inversion model
- Conduct experiments on the prompt to guide the direction of augmentation, and on the sampling method to augment

**Intelligent identification of ancient glass objects given statistical machine semester under small sample size** *China*

CUMCM 2022 *Sep 2022*

- Build a cardinality test and decision tree to explore the relationship between the weather ability of ancient glass objects and their properties
- Establish a probabilistic regression model of the distribution of guessing times to analyze the difficulty of Wordle games
- Identifying Significant Changes in Composition of Lead-Barium Glass and High Potassium Glass Before and After Weathering Using KS Test
- Construct regression models using semi-supervised learning to infer the chemical composition of a given glass artifact before weathering

**Matrix Class and CNN forward propagation Implementation in C++** *Shenzhen, China*

Southern University of Science and Technology *Sep 2021 - Dec 2021*

- Build a relatively complete calculation library by referring to the Class cv::Mat in OpenCV
- Support matrix of different basic data types
- Implement the region of interest (ROI) to avoid hard copying of memory
- Implement a CNN model that can predict if the input image is a person (upper body only) or not
- Conduct a Series of performance tests, comparisons and optimizations carried out on the X86 and ARM platforms

## Honors & Awards

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|---|---|---|
| 2023 | **Distinguished Student Assistant**, Student Assistant in Computer Network | *SUSTech* |
| 2022 | **Huawei "Intelligent Pedestal" Industry-Education Integration Collaborative Education Project Scholarship**, Excel in Machine Learning course | *Shenzhen* |
| 2022 | **Huawei "Intelligent Pedestal" Industry-Education Integration Collaborative Education Project Scholarship**, Excel in C/C++ Program Design course | *Shenzhen* |
| 2022 | **First Prize**, ASC Student Supercompute Challenge | *Asia Supercomputer Community* |
| 2022 | **Second Place**, 2022 APAC HPC-AI Competition | *Singapore* |
| 2022 | **Special Prize**, The 9th "League Cup" Undergraduate English Writing Contest | *Guangdong Province* |
| 2022 | **The 2nd prize**, SUSTech Excellent Student Scholarship | *SUSTech* |
| 2022 | **The 3rd prize**, Mathematical Contest in Modeling | *COMAP* |
| 2021 | **The 3rd prize**, SUSTech Excellent Student Scholarship | *SUSTech* |
| 2020 | **Special Prize**, Freshman Scholarship, ranked 2/1097 among all the freshmen | *SUSTech* |

## Skills

**Programming** Python(Numpy, Pytorch), C/C++, Java, SQL, Vue2

**Soft Skills** Teamwork, Time Management, Documentation, Presentation