

# Xiaohan LIU

Tel: +86 13129541353 | Email: [lxhpostgraduate@outlook.com](mailto:lxhpostgraduate@outlook.com) | Personal Homepage: <https://www.liuxiaohan666.top/>

## EDUCATION

Shenzhen Technology University (SZTU) (First-Tier Undergraduate University)

Shenzhen, China

➤ Bachelor of Engineering in **Computer Science and Technology** **09/2021 - 06/2025 (Expected)**

➤ **GPA: 3.46/4.5**

➤ **Core Courses:** Operating Systems, Artificial Intelligence, Machine Learning, Programming Development, Probability Theory, Linear Algebra, Discrete Mathematics, Advanced Mathematics, Software Engineering

➤ **Honors & Awards:**

**Class President** (09/2021-present)

**Excellent Class Collective Scholarship (Top 5%)**

**Outstanding Student Cadre Scholarship (Top 4%)** for two consecutive years, SZTU, 09/2021-09/2022

**Craftsman Star Scholarship (Top 10%)**, SZTU, 09/2022

**Research and Innovation Award Scholarship (Top 10%)**, SZTU, 09/2022

**Arts and Sports Excellence Scholarship (Top 10%)**, SZTU, 09/2022

## PROJECT EXPERIENCE

**Published Article: *A Multivariate Soil Temperature Interval Forecasting Method for Precision Regulation of Growth Environment*** **09/2024**

*Co-Author*

*Frontiers in Plant Science* (SCI, JCR-Q1, IF: 4.1). [doi.org/10.3389/fpls.2024.1460654](https://doi.org/10.3389/fpls.2024.1460654)

➤ Improved forecasting performance by employing Gradient Boosting Trees such as XGBoost, LightGBM, and CatBoost to optimize feature selection, reducing the model's RMSE by 0.175, which directly contributed to faster training and streamlined model complexity

➤ Developed the SP-N-HiTS-G model, an advanced multivariate soil temperature forecasting model combining Neural Hierarchical Interpolation for Time Series (N-HiTS) with Gaussian likelihood, reducing MAE by 0.065, 0.138, and 0.125 for 20, 60, and 120 minute forecasts, respectively, significantly outperforming traditional LSTM model

**Research and Application Demonstration of Key Technologies for Precision Management and Facility Cultivation of Lingnan Characteristic Flowers Based on IoT and Big Data** **07/2024**

*Core Member (10 people in total), Tutor: Prof. Hang Yin*

**Project NO.2022020302 of 2022 Yunfu Science and Technology Plan Project; Funding: CNY500,000**

➤ Developed an advanced growth monitoring model, YOLOv5s-STR2N-Fix model, integrating Swin Transformer and Res2Net modules to enhance the detection accuracy of Aglaonema Lady Valentine leaves across juvenile, expanding, and adult stages; achieved detection accuracies of 89.6%, 82.5%, and 76.2%, making improvements of 4.7%, 9.5%, and 4.8% over the original YOLOv5 model

➤ Incorporated leaf area and green spot ratio as key growth indicators into the YOLOv5s-STR2N-Fix model, resulting in a 3.7% accuracy improvement for the Expanding stage and an 8.2% improvement for the Adult stage, with final accuracies of 86.2% and 84.4% respectively

**Shandong Luneng Group's AI Edge Device-Based Charging Pile Operation and Maintenance Project** **04/2024**

*Project Manager (5 people in total) Tutor: Prof. Hang Yin*

➤ Developed an advanced detection model, R-YOLO model to the field of tiny flame detection, achieving 95.6% accuracy (an improvement of 2.8%) and reducing model parameters by 30%

➤ Deployed the improved YOLOv5 model to edge devices like Raspberry Pi 3B+, JetsonNano, MLU370, RK3588, and Huawei Atlas 500 for real-time fire detection, resolving computational redundancies and improving detection accuracy

● **Published Article: *Small Fire Detection Based on Improved YOLOv5*** in *ICAACE 2025 conference*, First author of the IEEE conference paper, Already accepted;

**National Copyright Administration of the People's Republic of China Computer Software Copyright Registration Certificate** **09/2024**

*Core Member (6 people in total)*

- Designed and implemented a front-end user interface for a rapid data collection and analysis system using Vue.js
- Wrote scripts in Python for automated testing, including brute stress testing, boundary value testing, and security testing to assess the software's load capacity
- Utilized Docker for containerized application deployment, improving release efficiency and environmental consistency

**Online Project of Algorithm Study based on Classification and Clustering Methods** **12/2021**

*Team Leader (3 people in total), Instructor: Prof. Shlomo Ta'asan from Carnegie Mellon University*

- Used the MLP algorithm for road sign recognition, achieving an accuracy rate of 38%
- Applied logistic regression, support vector machines, and MLP algorithms to road sign recognition, and set evaluation metrics for reasonable assessment
- **Published Article: *Performance Comparison of Road Sign Recognition Methods Based on Machine Learning, Applied and Computational Engineering*, 8,636-648. [doi.org/10.54254/2755-2721/8/20230290](https://doi.org/10.54254/2755-2721/8/20230290) (Co-first author of the international conference paper)**

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## TEACHING EXPERIENCE

**Teaching Assistant for Discrete Mathematics and Programming Fundamentals A** **09/2022-09/2023**

- Provided tutoring in Discrete Mathematics, covering topics such as Graph Theory and Linear Programming
- Developed an automated testing system using Python to systematically correct students' assignments

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## COMPETITIONS

**Higher Education Press Cup National Mathematical Modeling Competition** **09/2023**

*Leader*

- **Award: Second Prize in the Guangdong Division (Top 20%)**
- Utilized Python, leveraging libraries such as Pandas for data manipulation and Matplotlib for visualization, to process and analyze data effectively
- Applied Decision Tree to develop optimized solutions for seasonal vegetable sales, with Grid Search Techniques enhancing model accuracy by 2.8% to 93.6%

**HuaShu Cup National Mathematical Modeling Competition** **08/2023**

*Leader*

- **Award: Third Prize (Top 20%)**
- Developed a model using the Naive Bayes algorithm to link maternal physiological and psychological indicators with infant behavioral traits and sleep quality, achieving a 92.5% accuracy, validated through chi-square tests
- Authored and formatted research papers in LaTeX to streamline the documentation process and enhance readability

**Blue Bridge Cup Guangdong Province Programming Competition** **04/2024**

*Leader*

- **Award: Second Prize in Guangdong Division (Top 20%)**
- Optimized solutions for complex problems such as the Knapsack and Longest Common Sequence problems using dynamic programming algorithms
- Employed divide-and-conquer strategies to efficiently manage large datasets and enhance sorting and searching operations, notably through the implementation of QuickSort and MergeSort algorithms

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## SKILLS

**Programming Languages:** C, Python, Java, SQL

**ML&DL Tools:** Scikit-learn, PyTorch, TensorFlow

**Development Frameworks:** Vue, HTML, CSS, Javascript

**Practical Skill:** Software copyright writing, technical report writing

**Languages:** Mandarin (Native), English (Fluent) - IELTS 7.0