

Zhang Han

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EDUCATION

Guilin University of Technology	B.S. in Geographic Information Science	09/2021 – 06/2025
<ul style="list-style-type: none">• GPA: 88/100 (<i>View Transcript</i>) Rank: 3/96• Coursework: Cartography (94), UAV Remote Sensing (95), Design of Python Programming (95), Principles and Applications of Spatial Database (91), Secondary Development of GIS (95)• Ranked 1st in major for both comprehensive evaluation and cumulative GPA (92/100) during junior year; Scored ≥ 95 in 50 courses and ≥ 90 in 59 courses throughout the undergraduate program		
Guilin University of Technology	<i>Minor in Big Data Intelligent Mapping and Simulation</i>	09/2023 – 06/2025
<ul style="list-style-type: none">• GPA: 92/100• Coursework: Intelligent Mapping Engineering (91), Location-Based Service Network and Big Data Technology (95), Artificial Intelligence Methods and Applications (90), Virtual Reality and Real 3D Modeling (95)		

RESEARCH EXPERIENCE

1. Undergraduate Thesis: Optimization of Tropical Cyclone Detection and Area Estimation Algorithm Based on DynamiCyclone-YOLO	03/2025 – 06/2025
Supervisor: Prof. Jingwen Li	
<ul style="list-style-type: none">• Tropical cyclone object detection: Constructed the DynamiCyclone-YOLO model and performed on 4,800 Himawari satellite images obtained by Python web scraping over the Northwest Pacific from 2000 to 2024.• Tropical cyclone track prediction: Combined the detection boxes and coordinate outputs of DynamiCyclone-YOLO with historical cyclone track data, and fed them into MobileNetV3 to achieve end-to-end, multi-step regression forecasting of 24-hour future tracks.• Tropical cyclone area calculation: Applied a fixed brightness-temperature threshold to binarize the output images, counted the valid bright-region pixels, and converted them to physical area using the imagery's spatial resolution.	
2. Thesis: YOLOv8-MDA: Multi-Scale Dilated Attention Fusion for Infrared Small Object Detection	12/2024 – Present
Supervisor: Prof. Jingwen Li	
<ul style="list-style-type: none">• Constructed the YOLOv8-MDA model, using mAP50-95, mAP50, F1-score, precision, recall, FPS, parameter count, and FLOPs as evaluation metrics.• Performed module ablation experiments and comparative evaluations with YOLOv5, YOLOv6, and YOLOv8 on three open-source datasets to assess small-object detection performance on infrared imagery.• Presented detection results using various visualization techniques.• Outcomes: The architecture is finalized, implementation and evaluation are forthcoming, and a manuscript is planned for submission to an SCI Q4 journal.	
3. Estimation of daytime all-sky sea surface temperature from Himawari-8 based on multilayer stacking machine learning	11/2023 – 12/2023
<i>Project Team Leader</i>	Supervisor: Donglin Fan (Associate Professor)
<ul style="list-style-type: none">• Designed a three-layer stacked machine learning model (TLSM) with 22-dimensional input features and evaluated its performance using R^2, RMSE, and bias.• Constructed a training and testing sample set covering nine cloud types by matching Himawari-8 gridded imagery with cloud property products and in situ sea surface temperature (SST) data through three-level collocation in time, space, and quality flags.• Conducted multiple comparative experiments—such as SVR baseline model comparisons, cloud-type-specific evaluations, input configuration tests, and additional comparative studies—to achieve all-weather sea surface	

temperature retrieval.

- **Outcomes:** Won the Grand Prize in the Guangxi Geography Innovation Contest; work formed the basis for subsequent journal submission by the supervisor.

4. Road Extraction from Remote Sensing Imagery Based on Deep Learning 04/2023 – 04/2024

Project Team Member

Supervisor: Chao Ren (Professor)

- Proposed a **CoTPANeXt** road extraction model integrating multi-scale features to address the poor extraction of fine roads and ensure the integrity of primary roads at intersections and curves.
- Annotated over 3,000 high-resolution UAV images of rural towns in Guilin using LabelMe and evaluated performance using precision, recall, F1-score, and MIOU.
- Compared experimental results against existing networks—U-Net, ResNet, and CoTNeXt—to analyze model effectiveness.
- **Outcomes:** Undergraduate Innovation & Entrepreneurship Project – Provincial-Level – Rated “Excellent”

5. Inversion of Coastal Chlorophyll-a Concentration Using Mixture Density Network 04/2022 – 04/2023

Project Team Member

Supervisor: Donglin Fan (Associate Professor)

- Constructed a **mixture density network** (MDN) employing a Gaussian distribution as the kernel function and evaluated its precision using metrics such as R² and RMSE.
- Performed spatiotemporal collocation of Himawari-8 satellite data with in situ chlorophyll-a measurements from the Hong Kong Environmental Protection Department, applied atmospheric correction, and obtained real reflectance.
- Employed model inversion to derive nearshore chlorophyll-a concentrations and assess potential water pollution in Hong Kong’s coastal areas.
- **Outcomes:** Undergraduate Innovation & Entrepreneurship Project – University-Level - Rated “Good”

Supplementary Research Projects

1. Term Paper: AOD Retrieval via Multilayer Stacking ML (Physical Geography) 01/2024

- Independently authored a literature review integrating Himawari-8 satellite and AERONET ground data to assess feasibility of multilayer stacking machine learning for aerosol optical depth retrieval.

2. Preventing Fatigue Before It Happens 10/2023 – 06/2024

- Analyzed 1,200+ survey responses with descriptive statistics, cross-analysis, and clustering to model factors influencing alert-device purchase intention.
- Conducted multinomial logistic regression, chi-square tests, and fuzzy comprehensive evaluation to examine user-group differences and satisfaction.
- Employed web crawlers for text mining to extract user concerns, suggestions, and sentiments.
- **Outcomes:** Market Research and Analysis Competition — National Third Prize & Provincial First Prize

3. Silent dried fruits — a Promise with Yongfu. 10/2022 – 04/2023

- Analyzed 639 surveys using descriptive statistics to evaluate dried-fruit purchase behavior and poverty-alleviation awareness.
- Applied logistic regression to assess purchase intention.
- Leveraged K-means clustering and Random Forest to identify potential users and key drivers of consumer preferences.
- **Outcomes:** Market Research and Analysis Competition — Provincial First Prize

PUBLICATIONS

Xie, J., **Zhang, H.**, Wang, F., & Zhou, B. (2024). Analysis and evaluation of multi-scale spatial characteristics of rural residential areas. *Geomatics & Spatial Information Technology*, 47(6), 4–7. DOI: 10.3969/j.issn.1672-5867.2024.06.003

You, Y., Yang, Y., & **Zhang, H.** (2023). Priority options for the 17 UN Sustainable Development Strategies: Based on the model network perspective. *BCP Business & Management EMEHSS*, 49, 266–279. DOI: <https://doi.org/10.54691/bcpbm.v49i.5432>

COMPETITIONS

National Level

- 3rd Prize – The China National University Student Market Survey and Analysis Competition 2024
- Excellence Award, 12th National College GIS Application Skills Competition 2023

Provincial Level

- 1st Prize, 14th and 13th Market Research and Analysis Competition 2023 & 2024
- Outstanding Project, Innovation Program on “Road Extraction using Deep Learning” 2024
- Special Prize, Paper Competition – Guangxi Geo-Science Innovation Contest 2023
- 3rd Prize, National Mathematical Modeling Competition 2023
- Special & 2nd & 3rd & Excellence Prize, English Competitions 2021 - 2023

SCHOLARSHIPS & HONORS

Scholarships

- National Scholarship 2024
- The Special Prize Scholarship 2024
- The First Prize Scholarship 2022 & 2023

Honors & Titles

- Outstanding Graduate 2025
- Excellent League Member 2024
- Merit Student 2022 - 2024

WORK EXPERIENCE

Hangzhou SensingX Technology Co., Ltd. *Data Processing & Analysis Engineer* 02/2024 – 04/2024

- Annotated urban underground pipeline defects using proprietary software and technical manuals, classifying 10,000+ images into corrosion, leakage, displacement, and other categories.
- Maintained strict annotation quality and consistency, enabling downstream defect detection models to achieve high precision.

Zaozhuang Public Security Bureau, Shizhong Branch Traffic Police Unit 12/2022 – 02/2023

- Classified and labelled 5,000+ traffic-accident images per official severity/type protocols (e.g., collision, rear-end, rollover).
- Honed visual-detail acuity and maintained high annotation accuracy under real-world, time-constrained conditions.

On-campus Internships

- Surveying Practice Total Station, Level Instrument
- Fundamental GIS Practice SuperMap, ArcGIS, Handheld GPS
- GIS Spatial Analysis Practice ArcMap, ArcScene, Excel
- Photogrammetry and Remote Sensing VirtuoZo, ENVI
- Spatial Database Practice PostgreSQL, PostGIS, pgAdmin, ArcMap, CAD, GeoServer
- LBS Development and Application Practice HTML, CSS, JavaScript, PostgreSQL, Baidu Map API
- GIS Comprehensive Practice pycharm, pytorch, python

CAMPUS ACTIVITIES

Leaderships

- Secretary of the Youth League Branch & Class President 09/2024 – 06/2025
- Lecturer, Peer Teaching Program “Zhihui” 05/2024 – 06/2025
- Deputy Director, Student Department, University Youth League Committee 10/2023 – 10/2024

- Study Secretary 09/2023 – 09/2024
- Deputy Head of Archives Department, Party Affairs Center 09/2022 – 09/2023
- Deputy Head, Secretariat, Math Modeling Association 06/2022 – 06/2023
- Secretary of the Youth League Branch 09/2021 – 09/2022

Social Practice

- “Two Bombs, One Satellite” Spirit Volunteer Lecture Series 2023
- “Colorful Holiday” Rural Children Education Program 2023
- “Dream Fulfillment Project” for Underprivileged Students 2023
- 2023 Green Long March Scientific Expedition 2023
- “Three Going to the Countryside” Summer Social Practice 2022 & 2023

CERTIFICATES & QUALIFICATION

Skills

- Development Tools: Visual Studio, VS Code, PyCharm, PgAdmin
- Programming and Web: C#, Python, HTML/CSS/JavaScript, SQL
- GIS & Remote Sensing Tools: ArcGIS, ENVI, SuperMap, MapGIS, CAD, CASS
- Modeling & Visualization: 3ds Max, Unity, SketchUp, Pix4D

Certifications

- National Certificate of Informatization Engineer – Level 2: GIS Application Practice & Level 1: GIS Fundamental Theory (NCIE-GIS)
- UAV Safety Theory Certificate
- Market Research Analyst Certificate