WU CHAO

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Education Background

State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, ***Wuhan University***
Master of Engineering in Cartography and Geographic Information Engineering ***September 2023 – June 2026***
School of Resource and Environmental Sciences, ***Wuhan University*** **GPA:** 90.5/100 **Ranking:** Top 25%
Bachelor of Science in Geographic Information Science ***September 2019 – June 2023***

Internship Experience

United Nations Satellite Centre (UNOSAT), UNITAR ***Geneva, Switzerland***
Algorithm Engineer Intern ***March 2025 – September 2025***

- Redesigned the UNOSAT Web Mapping Platform by developing an open-source template for natural disaster; validated its performance during a typhoon in Vietnam; deployed the system as a containerized service officially adopted by UNOSAT.
- Authored a comprehensive manual standardizing emergency web map publication; defined a three-stage workflow covering from project preparation to web map creation; streamlined operations across ArcGIS Pro, ArcGIS Online and Cloud Servers.
- Conducted a technical evaluation of the Copernicus LAC open-source platform, assessing its capabilities for hazard mapping and disaster monitoring in Latin America and the Caribbean; analyzed its distributed and modular architecture to identify strengths, limitations, and opportunities for regional system enhancement.

Wuhan AI Research Institute, Institute of Automation, Chinese Academy of Sciences ***Wuhan, China***
Natural Language Processing Algorithm Engineer Intern ***August 2023 – November 2023***

- Migrated team-developed neural network models, including generative, classification, and retrieval models, from NVIDIA to Ascend GPUs; optimized performance and achieved precision alignment across frameworks.
- Processed nearly 15 TB of large-scale text data on a Slurm cluster; prepared high-quality datasets for pretraining the LLM.
- Deployed multiple AI models on Ascend 910B GPUs; packaged training and inference pipelines into Docker containers, enabling seamless delivery and online deployment.

AI Research Institute, Wuhan Baizhichengyuan Technology Co., Ltd. ***Wuhan, China***
Natural Language Processing Algorithm Engineer Intern ***April 2023 – June 2023***

- Constructed fine-tuning datasets from legal exam questions, statutes, and court cases; fine-tuned open-source language models for domain adaptation in legal text understanding.
- Developed a legal knowledge Q&A API using LangChain and Flask; implemented a retrieval-augmented generation (RAG) pipeline for real-time legal information retrieval.
- Deployed open-source generative and embedding models on Huawei Ascend 310 accelerators; optimized inference performance and ensured stable service delivery.

Rongzhi Lab, OPPO Research Institute, Department of Speech Semantics ***Shenzhen, China***
Natural Language Processing Algorithm Engineer Intern ***November 2022 – January 2023***

- Accelerated mobile inference by ~30% through INT8 quantization of neural networks; implemented operator fusion and replacement, optimized computational graphs using PyTorch and torch.fx; experimented with PTQ and QAT strategies to balance latency and precision.
- Deployed a lightweight CLIP-based image‑text retrieval model on MNN for **on-device multimodal search**; integrated quantized models into mobile inference pipelines; collaborated in the internal testing of SenseTime's PPQ toolkit to evaluate end-to-end quantization and deployment workflows.

Research Experience

Intelligent Diagnosis of Congenital Malformations Using Multi-Center, Multi-Modal Pregnancy Screening Data
National Key R&D Program ("14th Five-Year Plan") ***March 2024 – March 2025***

- Trained a multimodal large model for ultrasound-based fetal congenital heart disease diagnosis using the LLaVA architecture; optimized multi-image and multi-video data pipelines to reduce visual token complexity; applied reinforcement learning to enhance fine-grained diagnostic understanding.

- Developed an intelligent diagnosis system for congenital heart disease using Gradio, integrating model inference and visualization; presented the system as a key annual achievement in the progress report (Official News).

LLM-Driven Multimodal Knowledge Graph Construction for Bridges (IGARSS 2025 Oral, Repository)

Master's Research Topic ***September 2023 – March 2025***

- Trained a multimodal Bridge Knowledge Graph agent by collecting Q&A datasets with GPT-4o; fine-tuned open-source models (LLaMA, Qwen, GLM) via instruction tuning to decompose user tasks and invoke tools for constructing and integrating vector, raster, and text modalities.
- Developed automatic bridge segmentation for remote sensing images by training SAM on open-source datasets; enabled zero-prompt bridge extraction, improving efficiency for large-scale multimodal knowledge graph construction.

Intelligent Evaluation and AR-Based Presentation of Rural Cultural Tourism Attractions

Undergraduate Innovation and Entrepreneurship Project ***March 2021 – September 2022***

- Developed a sentiment analysis model for scenic spot reviews using Chinese BERT; applied transfer learning with customized architecture and hyperparameter tuning; reduced overfitting in fine-tuning, boosting sentiment classification accuracy by 5% over the BERT-Base baseline.
- Analyzed short-text review corpora using the Biterm Topic Model (BTM); identified key issues in rural tourism experiences through topic clustering and extracted actionable insights for attraction improvement.
- Built the backend for an Augmented Reality (AR) tourism service using Java Servlet; implemented logical layers for HTTP data requests, supporting real-time interactive content delivery for AR-enhanced scenic displays.

Web GIS Information Service Platform (http://www.wuchao.info/webgis)

Undergraduate Course Project ***May 2022 - September 2022***

- Designed and developed a full-stack Web GIS platform independently using a three-tier B/S architecture; implemented spatial data query, editing, and storage functionalities for interactive geographic information services.
- Built a constrained path planning service leveraging PostgreSQL and pgRouting; optimized routing algorithms to support multi-condition navigation and efficient spatial computation.
- Developed a 3D visualization demo of the Taohuayuan Scenic Area using CesiumJS; integrated terrain, building, and route data for immersive virtual geographic exploration.

Competition Experience

The 11th "China Software Cup" College Student Software Design Competition ***Nanjing, China***

National Second Prize, Top3 Teams ***May 2022 – August 2022***

- Developed a lightweight airport facial recognition system based on the domestic operating system SylixOS, leading high-level software design, defining the development roadmap, and breaking down tasks.
- Trained facial recognition models under the PyTorch framework, including face detection, facial landmark detection, and feature vectorization, and completed framework conversion.
- Implemented model inference in the NCNN framework and integrated core software functionalities into SylixOS, achieving over 90% facial recognition accuracy in official evaluations.

Additional Information

- **Technology Stack:** Python, Java, C++ | TensorFlow, PyTorch, DeepSpeed | Linux, Docker, Git | PostgreSQL
- **Languages:** Mandarin (Native), English (Fluent)
- **Scholarships:** National Scholarship (December 2020), University Outstanding Student Scholarship (December 2020)
- **Patents:** Xu, Y. C., **Wu, C.**, Liu, Z. L., & Du, B. 2025. A multimodal large model for measurement and diagnosis of fetal structural malformations. China Patent CN202510861522.9, filed June 2025, patent pending.
- **Software Copyrights:**

  Xu, Y. C., **Wu, C.**, Liu, Z. L., & Du, B. 2025. Multimodal Diagnostic System for Fetal Ultrasound Imaging. China Software Copyright RZTA20250344, filed June 2025, pending

  Wuhan University, Lightweight Airport Facial Recognition System Based on the Operating System SylixOS. China Software Copyright 2023SR0039854, registered January 2023

  Wuhan University. 2022. Augmented Reality Visualization Software for Cultural and Tourist Attractions. China Software Copyright 2022SR1082929, registered August 2022