JI CHENGZHI

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OBJECTIVE

Motivated master's student seeking a host laboratory for PhD research opportunities.

EDUCATION

University of Chinese Academy of Sciences (UCAS)
Institute of Software , Chinese Academy of Sciences (ISCAS) Beijing, China
M.S., Software Engineering Expected June 2025
UCAS ranked #**2** in Nature Index
Advisor: Senior Engineer Xin Zhou
GPA: 3.45/4
Related course taken:

- Deep Learning, Machine Learning, Advanced Software Engineering, Advanced Algorithm, Pattern Recognition and Machine Learning

Zhejiang University (ZJU) Hangzhou, China
B.S., Applied Bioscience June 2022
ZJU ranked #**44** in QS World University Rankings 2024
Chu Kochen Honors College
GPA: 3.78/4
Rank: Top 5%
Related course taken:

- Data Structure, Object-Oriented Programming, Software Engineering, Stochastic Process, Software Protection Technology
- Bioinformatics, Systems Biology, Biostatistics and Experiment Design

SKILLS

- C/C++, Python (PyTorch)
- Deep Learning, Object Detection, Self-Supervised Learning

RESEARCH EXPERIENCE

Deep Learning-Based Radio Signal Detection in Real-World Environments
Team leader September 2023

- **Objective**: Addressed a sequence processing challenge of detecting the start and end points of radio signals in real-world sample data.
- **Key Contributions**:
  - Developed **ConforDet**, a novel deep learning signal detection algorithm that enhances feature extraction using wavelet transforms.

- Leveraged the **Conformer** architecture for comprehensive local and global feature extraction from signals.
- Designed a specialized detection head optimized for sequence data, improving detection performance.
- Applied advanced detection methods, including **DETR** and **Deformable DETR**, for effective sequence data detection.
- Established a **self-supervised learning** framework to explore various methods (SimCLR, MoCo, SWAV, BYOL, MAE, BEiT, DeTReg) for wireless signal processing, optimizing detection accuracy without reliance on labeled data.

Intelligent Detection System for Weak Signals Based on Deep Learning
Key contributor October 2023

- Utilized Short-Time Fourier Transform (STFT) to convert sample data into time-frequency spectrograms, providing input for deep learning object detection models such as **YOLO**, **CenterNet**, and **DETR**.

Image Segmentation for Autonomous Driving Using the U-Net Model
Team leader August 2021

- Participated in MIT's online summer course on "Machine Learning + Computer Vision," focusing on cutting-edge applications of deep learning in computer vision.
- Led a team of 6 to complete image segmentation on an autonomous driving dataset in 14 days, independently designing and implementing the **U-Net** model with PyTorch, and achieved a course score of 92.5/100.

Development of Multivariate Trait Association Analysis Using Generalized Linear Mixed Models (GLMM)
Team leader September 2021

- **Objective**: Developed advanced **GLMMs** for multivariate trait association studies in biostatistics, creating software for simulation, validation, and practical application.
- **Key Contributions**:
  - Designed GLMM models and derived algorithms to solve complex nonlinear equations using **Gaussian** methods.
  - Enhanced computational efficiency through **parallel programming** and **GPU optimization**.

Development of Whole-Genome Methylation Sequencing Data Analysis Pipeline
Key contributor March 2021

- **Objective**: Constructed a comprehensive pipeline to analyze large-scale gene methylation sequencing data, integrating analysis and visualization at single-gene, chromosomal, and genomic levels.
- **Key Contributions**:
  - Independently developed **MethyAnalysis**, software capable of processing inputs up to **40 GB**, computing biologically significant information, and generating customizable profiles.
  - Optimized performance through **parallel computing** and utilized **memory mapping** to efficiently handle large-scale data I/O operations.

TECHNICAL EXPERIENCE

Radio Signal Localization Using TDOA Methods
Key contributor December 2023

- Led **WebSocket** network development, managing the project with **Git** and adhering to **software engineering** principles for design and implementation.
- Integrated deep learning signal detection, successfully reproducing algorithms from relevant literature independently.
- Developed a modular architecture, achieving direction-finding accuracy within a 5° error margin.

PUBLICATIONS

- *Ji, Chengzhi, and Xin Zhou. "Signal as Point: Deep Learning Signal Detector on Time Domain." 2024 IEEE 25th International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM). IEEE, 2024.*
- *Ji, Chengzhi, and Xin Zhou. "Exploring the Application of Self-Supervised Learning in Time-Domain Signal Detection." 2025 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). IEEE, 2025. Submitted for review.*

HONORS & AWARDS

Second-class Scholarship of University of Chinese Academy of Sciences	2023 and 2024
Scholarship for Pilotage in Chu Kochen Honors College of Zhejiang University	2019
National Encouragement Scholarship	2019 and 2020
Third-class Scholarship of Zhejiang University	2020