Ruijia (Rachel) Chang

(217) 841 1893 | Email: ruijiac3@illinois.edu | linkedin.com/in/ruijia-chang-00538434a

EDUCATION

University of Illinois at Urbana-Champaign, US Jan 2025 – Dec 2026 (Expected)

Master of Engineering in Electrical and Computer Engineering (GPA: 3.88/4.0)

Hangzhou City University, China Sep 2020 – Jul 2024

Bachelor of Engineering in Computer Science and Technology (GPA: 3.74/4.0, Top 5%)

TECHNICAL SKILLS

- Languages: Python, C/C++, SQL, Java, JavaScript(HTML/CSS), Bash
- Frameworks/Tools: PyTorch, Pandas, Scikit-learn, React, FastAPI, Git, Linux, Docker, AWS, Hadoop/Hive, Spark, CI/CD

PROFESSIONAL EXPERIENCES

Distress Bandanna, Inc., Illinois, U.S. – (*Software Engineering Capstone*, UIUC x Industry) Aug 2025 – Dec 2025

- Wrist Wearable Sensor to Predict Opioid-Induced Respiratory Depression
  - ✧ Implemented a modular **data-processing pipeline** (Python, multiprocessing) supporting **automated feature selection** and uncertainty scoring for RR variability, improving feature stability by 20%
  - ✧ Engineered a production-ready **forecasting service** using a Transformer–XGBoost model stack, enabling low-latency (<120 ms) multi-horizon SpO_2/RR prediction (10 s–5 min) and improving long-range forecasting consistency by 15–18%.

MinFound Medical Systems Co., Ltd., Zhejiang, China (*Software Engineer***)** Jun 2024 – Nov 2024

- Multi-Scale nnU-Net for Metal Implant Segmentation
  - ✧ Motivated by the small, high-density, and artifact-prone implant regions in head CTs, designed **a multi-scale patch sampling** and feature fusion strategy (64/128) for **3D nnU-Net** to capture both local detail and global context.
  - ✧ Reconstructed the **Dice + Focal hybrid loss** to mitigate class imbalance, improving implant boundary Dice by **+3-4 points**.
- Self-Supervised Correction of Reconstruction Artifacts in PET/CT Images
  - ✧ Addressed regional artifacts that appeared in reconstructed PET/CT images by integrating a Noise2Void-based **self-supervised post-processing module** into the reconstruction pipeline to enhance image quality and consistency.
  - ✧ Achieved **~80%** artifact reduction (evaluated by AER) in high-uptake regions across 359 clinical cases.

High-Performance Intelligent Graph Computing Research Center, Zhejiang, China (*Research Assistant***)** Sep 2023 – Jun 2024

- Supervised Contrastive Learning for Chromosome Recognition
  - ✧ Implemented pair-wise data pipelines and training routines with a **supervised contrastive loss** to improve the cross-center generalization of chromosome representation learning, ensure consistent feature distributions across datasets.
  - ✧ Benchmarked **Transformer/CNN-based architectures** (e.g., ResNet, ViT, Swin) and SOTA domain models to validate the proposed method, supported by t-SNE, confusion matrix and heatmap visualizations for feature representation analysis.
- Self-Supervised Pre-training for Medical Microscopy Segmentation
  - ✧ Built a **pre-training framework** leveraging the **Segment Anything Model (SAM)** to generate pseudo-masks for unlabeled microscopy cell data and implemented a **Contrastive Momentum Pyramid architecture** to enhance structural discriminability.
  - ✧ Reproduced 9 self-supervised pre-training methods (e.g., MAE, DINO, MoCo) to establish baseline performance.

PROJECT

Full-Stack Web System- Legal Case RAG (Illinois Case Dataset) March 2025 – May 2025

- Developed a full-stack legal information platform with a **JavaScript-based** front-end and a **FastAPI** back-end, integrating **ChromaDB**, **LangChain**, and **LoRA-optimized RAG** modules, and deployed the system via **Nginx on Ubuntu**.
- Built **the complete retrieval and generation pipeline**, including embedding-based vector indexing, state-aware filtering, **REST API** endpoints, async backend processing, and structured client–server communication for real-time statute lookup and case retrieval.

PUBLICATION

- (**First Author**) **R. Chang** et al., "Visual Encoders for Generalized Chromosome Recognition," 2025 IEEE International Conference on Image Processing (ICIP), Anchorage, AK, USA, 2025, pp. 1444-1449, doi: 10.1109/ICIP55913.2025.11084686.
- (**First Inventor**) Patent Pending: Fine-Grained Chromosome Recognition Method Based on Supervised Contrast Learning