

Ruijia Chang

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EDUCATION

University of Illinois at Urbana-Champaign, US

Jan 2025 – Dec 2026 (Expected)

Master of Engineering in Electrical and Computer Engineering (GPA: 3.82/4.0)

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, Spark, Hadoop/Hive, Tableau, FastAPI, Git, Linux, Docker, AWS, 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*

- Built a modular **feature-level modeling pipeline** in Python with multiprocessing support, integrating **wrapper-based feature selection** for respiratory rate prediction and reducing RR MAE from 1.07 to 0.86 ($\approx 20\%$ relative reduction).
- Engineered a **forecasting pipeline** using a Transformer–XGBoost model stack, enabling low-latency (<120 ms) multi-horizon SpO₂/RR prediction (10 s–5 min) and maintaining SpO₂ MAE ≈ 0.43 – 0.66 and RR MAE ≈ 0.84 – 1.03 across horizons.

MinFound Medical Systems Co., Ltd., Zhejiang, China (*Software Engineer*)

Jun 2024 – Nov 2024

– *Multi-Scale nnU-Net for Metal Implant Segmentation*

- Designed a **multi-scale patch sampling** strategy (64/128) for **3D nnU-Net** to improve segmentation of small implant regions in head CTs by balancing local detail and anatomical context, and introduced a **Dice + Focal hybrid loss** to handle class imbalance and hard boundary regions, improving boundary Dice by +3–4 points.

– *Self-Supervised Correction of Reconstruction Artifacts in PET/CT Images*

- Addressed regional artifacts in reconstructed PET/CT images by integrating a Noise2Void-based **self-supervised post-processing module**, improving image quality while keeping the original reconstruction pipeline unchanged.
- Achieved $\sim 80\%$ artifact reduction (evaluated by AER) in high-uptake regions across 359 real-world clinical cases.

High-Performance Intelligent Graph Computing Research Center, Zhejiang, China (*Research Assistant*)

Sep 2023 – Jun 2024

– *Supervised Contrastive Learning for Chromosome Recognition*

- Addressed **cross-center generalization issues** in chromosome recognition by designing a **pair-wise supervised contrastive learning** framework to enforce consistent feature representations across multi-center 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.

PROJECTS

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 a **RAG-based retrieval system** using ChromaDB and optional **LoRA-based fine-tuning**, and deployed the service via **Nginx on Ubuntu**.
- Built an **end-to-end retrieval and generation pipeline** with embedding-based vector indexing, state-aware filtering, and async REST APIs, enabling real-time statute lookup and case retrieval through a conversational interface.

PUBLICATIONS

- (**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