

Jiarui Li

Jiangbei, Chongqing, China

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Personal Profile

A Computer Science Ph.D. student from Tulane University focusing on the interdisciplinary between computation and immunology. Achieved first class science bachelor's degree with honors from the University of Nottingham Ningbo China. Familiar with machine learning and deep learning models, web full stack and maintenance techniques, and immunological and biological analysis tools. Interested in modeling immunology pathway and discovery new treatment solution with computation tools.

Education

Tulane University

Candidate Ph.D. in Computer Science

- Research Topic: Bioinformatics and Immunoinformatics

Louisiana, United States

Sept 2023 - Present

University of Nottingham Ningbo China

BSc Hons Computer Science with Artificial Intelligence

- Graduated with Honor First Class Degree** (Top 1% Student)
- Dissertation: Artificial Intelligence Based Drug Discovery

Zhejiang, China

Sept 2019 - July 2023

University of Birmingham

UG Aff Computer Science and Software Engineering

- Undergraduate Exchange Program** (Average Score: 92)
- Project: GPT-3 Based Interview Preparation Website

Birmingham, United Kingdom

Sept 2021 - June 2022

Publications

CONFERENCE PROCEEDINGS

Dual-Stream Siamese Vision Transformer With Mutual Attention For Radar Gait Verification

Ran Ji, Jiarui Li, Wentao He, Jianfeng Ren, Xudong Jiang

ICASSP 2023-2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2023

Prediction of Enantioselectivity in Asymmetric Catalysis Using Attention U-Net with UMAP Clustering and Random Forest

Jiarui Li, Ran Ji, Di Wang, D. Jonathan Hirst, Bencan Tang, Jianfeng Ren

*Under Reviewing (2023). 2023

Funding

2024 **AWS Public Sector Cloud Credit for Research**, Amazon AWS

\$4,984.00

Awards

2023 **Tulane Ph.D. Funding**, Tulane University

Louisiana, US

2023 **Zhejiang Excellent Graduates**, Zhejiang Provincial Government

Zhejiang, China

2022 **Best Performer**, University of Nottingham Ningbo China

Zhejiang, China

2022 **President's Scholarship**, University of Nottingham Ningbo China

Zhejiang, China

2022 **Zhejiang Provincial Scholarship**, Zhejiang Provincial Government

Zhejiang, China

2021 **Provost's Scholarship**, University of Nottingham Ningbo China

Zhejiang, China

2021 **Government Scholarship for Mobility Out**, Ningbo Municipal Government

Zhejiang, China

2020 **Outstanding Staff**, UNNC Science and Technology Student Association

Zhejiang, China

Work Experience

Tulane University

Research Assistant

- Optimize MHC-II Peptide Binding Prediction Algorithm.
- Develop And Design CUDA Based High Performance Computation Platform.
- Develop Web Server for MHC-II Peptide Binding Prediction Pipeline.

Louisiana, US

August 2023 - Present

Shanghai Institution of Materia Medica, China Academy of Science

Shanghai, China

Internship

June 2023 - July 2023

- Learned experiments including Western Blot, Cell Formation Assay, and Protein quantitative analysis.
- Researched SOS-1 and SHP-2 inhibitors

Research Experience

IC50 Prediction of SOS-1 and SHP-2 Inhibitor.

Shanghai, China

Shanghai Institution of Materia Medica & University of Nottingham Ningbo China

June 2023 - July 2023

- Designed a new evaluation method for algorithms.
- Designed a multi-stage algorithm for IC50 prediction and surpassed the STOA.
- Designed Graph Neural Networks and Transformer for IC50 prediction.

Machine Learning Based Radar Gait Verification

Zhejiang, China

University of Nottingham Ningbo China

Sept 2022 - Jan 2023

- Designed a Siamese vision transformer with mutual attention.
- Designed a mutual attention fusion mechanism.
- Designed a time and frequency embedding method for signal processing.

Artificial Intelligence Based Drug Discovery Cloud Platform Provincial Grant Application

Zhejiang, China

University of Nottingham Ningbo China

July 2021 - Sept 2021

- Designed the architecture of the cloud platform.
- Designed the core algorithm for structure-activity prediction.

Enantiomeric Excess Prediction with Machine Learning

Zhejiang, China

University of Nottingham Ningbo China

July 2021 - May 2023

- Analyzed the features of a dataset for asymmetric catalysis containing the quantum data for both substrates and catalysts.
- Designed a dual stream mutual attention transformer to predict the enantiomeric excess.
- Designed an attention U-Net to predict the enantiomeric excess.
- Created co-matrices for all the substances to ensure recognizable structure and model improvement.

Vehicle Detection on Drone Captured Images

Zhejiang, China

University of Nottingham Ningbo China

Jan 2021 - July 2021

- Transplanted Yolo-v5 to the dataset and improved its loss function to achieve better performance than STOA.
- Studied models such as RCNN/YOLO family and model improvement methods from Efficient-Net.

MRI Image Tumor Segmentation

Zhejiang, China

University of Nottingham Ningbo China

Sept 2020 - Dec 2020

- Evaluated the datasets, including CORN, VETO, MMM-21, and ROSE, by reading related papers for research potential.
- Created models such as U-Net and U-Net++ for object detection and segmentation on medical images with PyTorch or TensorFlow.

Project Experience

Artificial Intelligence Aided Drug Discovery Cloud Platform

Zhejiang, China

University of Nottingham Ningbo China

Jan 2022 - June 2022

- Implemented fast access on million data based on MongoDB and Redis.
- Designed the model flow structure and implemented basic REST-API.
- Designed the front-end of the platform.

Flight Foresight

Zhejiang, China

University of Nottingham Ningbo China

Apr 2022 - May 2022

- Built aircraft delay prediction model utilizing Spark.
- Designed front-end for the software.

X-Room

Zhejiang, China

University of Nottingham Ningbo China

March 2022 - May 2022

- Utilized YOLOv8 for lecturer tracking and super resolution.
- Created flow model to allow automatic parallel.
- Implemented optical character recognition and automatic note.

HirePrep

Birmingham, UK

University of Birmingham

Jan 2022 - May 2022

- Designed and implemented REST API, voice control
- Designed user interface appearance and animation.
- Utilized the APIs of GPT-3 from OPENAI to generate interview questions and evaluate the answers from users.

Skills

Programming	C/C++, Java, C#, Python, PHP, JavaScript, Assembly(MIPS), Haskell, VB.net
Database	MySQL, SQLite, MongoDB, Redis
Web	HTML, CSS, Bulma, Tailwind, JavaScript, JQuery, Django, Flask, IIS, Apache HTTP
Documentation	LaTeX, Markdown, Swagger, Overleaf
Machine Learning & Big Data	Pytorch, PyG, TensorFlow, Pandas, Numpy, scikit-learn, scipy, Hadoop, Spark
Tool & System	Linux, Windows, Windows IOT, Git, Anaconda, Docker
Visualization	Matplotlib, Plotly, Streamlit, 3DMol.js
Hardward	Arduino, Raspberry Pi, STM32, Digital Logical Circuit
Internet Service Maintenance	Nginx, Rocket Chat, OpenVPN, Poste.io
Chemistry & Biology	RDKit, Vina Docking, ChemDraw, DeepChem
Musical Instrument	Guqin (Traditional Chinese String Instrument)

Languages

Chinese	Native proficiency
English	Professional proficiency