

Yiwen Lu

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EDUCATION

North Carolina State University, Raleigh, United States 2024 Campus Research Program
Beijing Jiaotong University, Beijing, China Enrolled: Sept 2021 — Expected: Jul 2025
Computer Science GPA: 3.73/ 4 88.2/ 100
Key Courses: Computer Vision, Deep Learning(A), Discrete Mathematics(A), Probability Theory and Mathematical Statistics(A), Numerical Methods(A), Introduction to Artificial Intelligence(A), Fundamental of Digital System(A)

RESEARCH EXPERIENCE

North Carolina State University Advised by: [Chenhan Xu](#)
Research Assistant Jun 2024 - Present

- Conducted a comprehensive study to reconstruct unseen fingerprints from known fingerprints.
- Employed diffusion models, CycleGAN, and pix2pix to assess their performance in generating highly detailed fingerprint images.
- Developed and integrated fingerprint orientation and frequency encoders, enabling a thorough comparison of these models' effectiveness in capturing the intricate patterns of fingerprint data.

Beijing Key Lab of Traffic Data Analysis and Mining, Beijing Jiaotong University Advised by: [Huaiyu Wan](#)
Research Assistant Spatio-temporal Data Mining Apr 2023 - Present

- **Mob-Motif**
 - Developed a Rotary Time Aware Position Encoder in Mobility Model to capture absolute time span and relative periodical pattern.
 - Designed Inter-Motif Conv and Intra-Motif Conv to discover travel preference.
- **Mobility-LLM Framework**
 - Developed a novel framework to leverage large language models (LLMs) for extracting insights from check-in sequences across various tasks.
 - Applied advanced techniques to enhance the model's ability to interpret and utilize check-in data effectively.
- **A novel spatial-temporal contrastive diffusion framework for check-in sequence generation**
 - Proposed an innovative spatial-temporal vector representation for encoding user interest point sequences.
 - Participated in the design of the contrastive diffusion process and conditional U-Net architecture.

INTERN EXPERIENCE

Huawei Technologies Co., Ltd. Beijing, China
Huawei Kunpeng Developer Program, Kunpeng BoostKit Function Library Development Sept 2023 - Jan 2024

- Conducted disassembly and analysis of x86 programs using IDA Pro and successfully translated disassembled x86 code to ARM architecture through meticulous step-by-step replication.
- Ensured the precision of the developed libm interfaces matched exactly with the x86 imf2021 function interfaces, achieving 100% consistency in calculations.
- Validated the robustness of the implementation with over one million test cases, ensuring identical results for all input parameters.

IFLYTEK Co.,Ltd. Hefei, China
Summer Intern, Software Engineer Jul 2023 - Aug 2023

- Contributed to the development of the iFlyAICC Intelligent Contact Center project, integrating multiple advanced technologies including softswitch, automatic call distribution, audio/video communication, and artificial intelligence.
- Played a key role in developing critical features for the agent workspace, such as data monitoring and customer management functionalities, enhancing the overall efficiency and effectiveness of the contact center.

PUBLICATIONS

- **Mobility-LLM: Learning Visiting Intentions and Travel Preference from Human Mobility Data with Large Language Models**
Letian Gong, Yan Lin, Xinyue Zhang, **Yiwen Lu**, Xuedi Han, Yichen Liu, Shengnan Guo, Youfang Lin, Huaiyu Wan
NeurIPS 2024 Accepted [[abstract](#)] [[pdf](#)]
- **Research on Prediction of Key Points in Tennis Matches Based on Neural Network and Momentum Analysis**
Yiwen Lu
IPIIS 2024 [[pdf](#)]

PROJECTS

A novel spatial-temporal contrastive diffusion framework for check-in sequence generation [\[report\]](#)

- Participated in the design of the contrastive diffusion process and conditional U-Net architecture.
- Optimized the extraction of effective data from four datasets comprising millions of records, providing high-quality learning samples covering both campus and urban check-in sequences.
- Contributed to the experimentation and evaluation of Baseline models.

3D Object Detection based on Point Cloud, Competition Project [\[code\]](#)

- Utilized the OpenPCDet library to preprocess raw point cloud data into a format suitable for network input.
- Used the TED model's sparse convolution backbone to extract transformation-equivariant voxel features.
- Aligned and aggregated these equivariant features into a lightweight and compact representation for high-performance multi-category 3D object detection on a private competition dataset.

Exploration of medical image segmentation based on UNet and Transformer architecture [\[report\]](#) [\[code\]](#)

- Reproduced a research paper from scratch, integrating the strengths of convolutional and attention strategies to propose an efficient self-attention mechanism.
- Introduced a novel self-attention decoder to recover detailed information from skip connections within the encoder.
- Employed advanced training techniques, including:
 - Pre-activation ResBlock: Enabled direct information flow between any two modules during forward and backward propagation, enhancing network efficiency.
 - Dice Loss: Achieved superior performance in handling class imbalance and segmenting images with small but numerous targets.

HONORS and AWARDS

Excellent Academic Scholarship Third Class (top 15% of School) x2	Oct 2023
Student's Innovation Training Program, Sponsored by the Ministry of Education	May 2023
Outstanding Student Leader in Beijing Jiaotong University	May 2023
Beijing Big Data Skills Competition Intelligent Connected Track, 4th Place	Nov 2023
China Undergraduate Mathematical Contest in Modeling, Provincial 2nd Prize	Sept 2023
The Chinese Mathematics Competition, Provincial 2nd Prize	Nov 2022
Chinese Girls' Mathematical Olympiad, Bronze Prize	Aug 2020

SKILLS

- **Language Skills:** TOEFL: 96(22) best score: 101
- **IT Skills:** Python, C++/ C, Java, SQL, Deep Learning, Reinforce Learning, HTML/CSS
- **Communication Skills:** Chairman of the Scientific Research Platform, Student Science and Technology Association, Beijing Jiaotong University