Xinyuan Xia

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Education

Shanghai Jiao Tong University **Sep. 2022 – Current**

Artificial Intelligence (Honor Class) ,The School of Electronics, Information and Electrical Engineering *Shanghai, China*

Undergraduate student with GPA 4.01/4.30, TOEFL iBT 112/120 (L30 R29 S25 W28)

Relevant Coursework:

- **Mathematics**: Linear Algebra, Probability and Statistics, Linear and Convex Optimization, Stochastic Processes
- **Artificial Intelligence**: Machine Learning, Deep Learning, Computer Vision, Reinforcement Learning
- **Robotics & Control**: Robotics, Control Theory, Digital Signal and Image Processing, Signals and Systems
- **Computer Science**: Data Structures, Design and Analysis of Algorithms, Program Design

Research Experience

OpenRobotLab: VLN-PE **August 2024 – Current**

Undergraduate research Intern, supervised by Prof. Jiangmiao Pang, Prof. Hanqing Wang Shanghai AI Lab, Shanghai, China

- Identified limitations of **idealized robot movement assumptions** in Vision-and-Language Navigation (VLN) systems(Habitat), motivating the need for embodied navigation evaluation frameworks.
- Developed **VLN-PE**, a physically realistic navigation platform based on GRUtopia (developed upon Isaac Sim), supporting **cross-embodiment evaluation** (humanoid/quadruped/wheeled robots) with **multi-model integration** including action classification networks, waypoint diffusion models, and map-enhanced LLM planning systems.
- Revealed performance gap between platforms through systematic evaluation, identifying critical challenges in robot observation constraints, environmental lighting variations, and legged robots' locomotion limitations.
- Models trained on our platform demonstrates a 25% performance improvement over those on Habitat in real-world scenario. Our work is under review at ICCV 2025.

MedIA: Medical Image Analysis Group **July 2023 – July 2024**

Undergraduate research Intern, supervised by Prof. Yi Hong *Shanghai Jiao Tong University, Shanghai, China*

- Studied state-of-the-art detection models (**GLIP**, **DETR**, **Grounding-DINO**) for medical image segmentation, selecting Grounding-DINO as the base model due to its superior open-set detection capability.
- Curated and preprocessed the **PMC-OA** dataset (15K image-text pairs), fine-tuning backbone using **MMDetection**
- Applied UNet to brain MRI datasets (ADNI), achieving a **12.4%** improvement in Dice score compared to untrained baseline methods through multi-modal feature alignment and contrastive learning.
- Published work at **ICASSP 2025**, a novel language-driven segmentation framework for brain MRI analysis.

Cloud Computing with Big Data **July 2024**

Summer Workshop, supervised by Prof. Richard T. B. Ma *National University of Singapore, Singapore*

- Identified opportunities to enhance generative AI adoption in **professional workflows** and **cross-team collaboration** scenarios through infrastructure optimization.
- Architected **Kubernetes-based solutions** for multi-user collaboration and high-concurrency messaging systems via automated scaling, resource prioritization, and fault-tolerant pod deployments.
- Orchestrated **cloud-native** AI platform on AWS EKS, **decoupling** components (Frontend, Backend, OpenAI API Workers, etc) into isolated Pods with persistent storage for context-aware interactions and self-healing capabilities.
- Open-sourced IntelliDoc, an AI documentation assistant leveraging Kubernetes job scheduling for parallel processing, winning **Third prize** in 2024 NUS-SOC summer workshop and A+(hightest) performance.

Honors and Awards

- Shanghai Scholarship (top 0.2% in Shanghai) **2023**
- Academic Excellence Scholarship of SJTU (top 10% in SJTU) **2023, 2024**
- Second Prize in China Undergraduate Mathematical Contest in Modelling (top 3% among 54000+ teams) **2023**

Technical Skills

Programming Languages: Python (NumPy, PyTorch), C++, MATLAB
Tools & Frameworks: Isaac Sim, Anaconda, VS Code, Git, Linux, LaTeX, Kubernetes, Docker
Areas of Expertise: Machine Learning, Computer Vision, Natural Language Processing, Cloud Computing