Nengxin Mou

Tel: (+86) 188-6815-4149 · Email: nengxinmou@outlook.com · ·

Education

Hohai University, Nanjing, China Sept. 2023 – Present

Candidate for Bachelor of Engineering in Computer Science and Technology
GPA: 4.53/5.0 **Avg. Score**: 90.17/100 **Major Rank**: 41/217
Test Scores: TOEFL iBT: 98
Scholarships: Academic Excellence Scholarship (1 time), Arts and Sports Excellence Scholarship (1 time)

Research & Project Experience

Institute of Robotics and Intelligent Manufacturing, CUHK-Shenzhen Jan. 2026 – Present

Research Intern | Shenzhen, China

- **Research Focus**: Investigating **UAV Flight Safety in Complex Urban Airspace**, aiming to enable robust autonomous operations in high-density obstacle environments.
- **Algorithm**: Developing optimal path planning modules based on the **RRT* (Rapidly-exploring Random Tree Star)** algorithm. Focusing on real-time collision avoidance and trajectory optimization.
- **Engineering**: Implementing core navigation logic and simulation environments using **Java**; benchmarking the RRT* planner against dynamic obstacles to validate safety metrics.

Research on 2D Obstacle Avoidance Model Based on Field Rescue Jun. 2024 – Aug. 2024

Student Researcher | Advisor: Peter Zhang (Assistant Professor, Carnegie Mellon University)

- **Background**: Addressed robot path planning challenges in a 100x100 grid environment with complex obstacles, exploring low-cost avoidance strategies.
- **Analysis**: Conducted comparative analysis of four RL algorithms (**DQL**, **PPO**, **A2C**, **DQN**). Experimental results demonstrated that DQL outperformed baselines with a **0.70 success rate** and the highest average reward (**61,042**).
- **Contribution**: Authored the Introduction and Literature Review sections, analyzing limitations of traditional methods (e.g., Bug Algorithms). Designed architectural diagrams and visualized experimental data for the published paper.

Financial News Sentiment Analysis based on LLM Jul. 2024 – Aug. 2024

Core Member | MIT xPRO TechXcelerate Program (Blended Learning)

- **Objective**: Conducted sentiment polarity classification on financial news, addressing data imbalance in domain-specific corpora using advanced NLP techniques.
- **Implementation**: Benchmarked XGBoost against LLMs. Fine-tuned **Llama 3** using **LoRA** and implemented data augmentation, achieving a **54% improvement** in accuracy on minority classes.
- **Role**: Led the quantitative analysis and visualization of model performance. Delivered the final presentation covering the **research background and experiments overview**, receiving a strong recommendation from the Project Lead.

Publications

- Ye Zhou, **Nengxin Mou**. "Research on 2D Obstacle Avoidance Model Based on Field Rescue". *2024 International Conference on Modeling, Simulation and Control Engineering (ICMSCE)*. **DOI**: 10.1145/3719477.3719479

Honors & Awards

- National First Prize, 7th National College Students Art Exhibition Jun. 2024
- Provincial Grand Prize, 7th Jiangsu College Students Art Exhibition Oct. 2023
- Individual Third Prize, The 12th Programming Contest of Hohai University Jan. 2024

Skills

- **Languages**: Python, C, Java, LaTeX
- **Frameworks & Tools**: PyTorch, Reinforcement Learning (RL), LLM Fine-tuning