Shuaixing Chen

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EDUCATION

Shanghai Jiao Tong University (SJTU), Shanghai, China *Sep 2021 - June 2025(expected)*
B.E. in Electrical Engineering,
Core Courses: Machine Learning (A), AD Algorithm (A), Intelligent Perception (A), Program Algorithm Design (A-)
My Current Interests include:

- AIGC for life and health.
- LLM Agents in life and tools.

PUBLICATIONS

- Lingfeng Zhou*, **Shuaixing Chen***, Jin Gao, Dequan Wang: *LLM-POWERED CONSENSUS FOR INTELLIGENT TRANSPORTATION SYSTEM. (Under review in ICLR 2024 Workshop AGI)*
  * Equal Contribution

RESEARCH EXPERIENCE

LLM Agents Consensus for AD Simulation | Research Assistant *Oct 2023 - Feb 2024*
Advisor: **Professor Dequan Wang**, Department of Computer Science and Technology, Shanghai Jiao Tong University

- Integrated the Raft algorithm with LLMs to achieve consensus among LLM Agents in AD simulation.
- Proposed a new method combining Raft and LLM has been proposed, dynamically grouping agents to achieve information synchronization, ultimately ensuring communication among LLMs and environmental stability during the simLLM simulation process.
- Constructed an AD simulation env that synchronizes and merges content among LLM agents, proving Raft's importance. The first-author paper has been submitted to **ICIR 2024 Workshop AGI.**

Image Generation and Editing System based on Diffusion Models | Research Assistant *May 2023 - Present*
Advisor: **Professor Yichao Yan**, Department of Computer Science and Technology, Shanghai Jiao Tong University

- Proposed a method combining Gaussian splatting and morphing field reconstruction to achieve video obstacle and shadow removal.
- Integrates the concepts of dynamic scene reconstruction and HyperNeRF, taking into account the capabilities of Gaussian splatting, suitable for more powerful video reconstruction and shadow obstacle removal work.
- Boosted the PSNR by 3-4% compared to traditional methods. The relevant paper is being prepared for submission to ECCV 2024.

Small Object Detection and Recognition in Autonomous Driving | Research Assistant *March 2023 - Feb 2024*
Advisor: **Prof. Manhua Liu,** Department of Computer Science and Technology, Shanghai Jiao Tong University

- Proposed adjustments to the DETR network for small object detection tasks and explored the effectiveness of mask networks in detecting small objects.
- Combined and adjusted DINO, DETR, and other end-to-end object detection networks with mask self-supervised networks for enhanced small object detection, exploring mask network capabilities in this context.
- Boosted DETR by 3 to 5 AP points, enhancing small object detection and proving mask networks' effectiveness for such tasks.

Research on Active Target Tracking Algorithms in CV | Research Assistant *June 2022 - August 2023*
Advisor: **Professor Yu Qiao**, Department of Automation, Shanghai Jiao Tong University

- Proposed a target detection comparison environment based on active object tracking, comparing and evaluating mainstream video object tracking algorithms.
- Integrated UnrealCV to build an object tracking and detection system in UE4, allowing for evaluation and comparison of different algorithms to derive final algorithm assessment outcomes.

- Built a simulated environment with a virtual reality setup and integrated systems, supporting multi-environment object tracking using various datasets. All environment information can be viewed here.

Design and Development of Intelligent IoT Ultra-Low Power Nodes | Research Assistant *Sep 2022 - June 2023*
Advisor: **Prof. Xiaohua Tian**, Department of Electronic Engineering, Shanghai Jiao Tong University

- Proposed a new ultra-low power software radio system capable of minimal functionalities and OTA (Over-The-Air) remote communication.
- Developed a compact, ultra-low power software radio based on the LoRa protocol to address size and convenience issues, modifying the node for long-distance OTA update capabilities.
- Addressed size and portability issues in software radios with our proposed solution, significantly enhancing expandability and extending ultra-low power features to reduce power consumption to the milliwatt level.

Survey of Computer Vision Recognition Algorithms | Summer Research Intern *June 2022 - Sep 2022*
Advisor: **Prof. Wei Shen**, Department of Computer Science and Technology, Shanghai Jiao Tong University

- Conducted a survey of commonly used visual recognition algorithm frameworks and carried out multi-dimensional, multi-scale experiments on these frameworks to assess the strengths and weaknesses of popular deep learning algorithms in applied downstream tasks.
- Surveyed common visual recognition algorithms, including DETR, convolutional networks, and mask recognition networks. We analyzed these algorithms for a variety of visual recognition tasks, such as small and large object recognition, multi-task recognition, and visual object detection, culminating in a comprehensive review and comparison.
- Compared mainstream recognition algorithms comprehensively, establishing a foundation for specific downstream task development and earning excellent evaluations in the internal review stage.

INDEPENDENT PROJECT

Sophx Knowledge Graph Project | Main Developer *Feb 2017 - Mar 2017*
Advisor: **Prof. Lei Xing**, Department of Education and Technology, Shanghai Jiao Tong University

- Worked independently on developing the prototype for the SOPHX Knowledge Graph Project, employing MySQL, Echarts, PHP, and JavaScript.
- Focused on crafting a user-friendly interface for the knowledge graph, aiming to simplify information retrieval and enhance data visualization through dynamic presentations.
- Completed the initial phase and internal testing, preparing for the upcoming showcase at SOPHX, with the project receiving positive preliminary feedback.

AWARDS

M Prize in ICM 2023 *March 2023*

SKILLS

- **Computer Languages:** Python, C++, JavaScript
- **Deep Learning Architectures**: CNN, ViT, MIM, DINO, Diffusion Model, GPT
- **Tools**: MySQL, Echarts