西北工业大学 NORTHWESTERN POLYTECHNICAL UNIVERSITY

Mr. Like Liu

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EDUCATION

Northwestern Polytechnical University (NPU) **Xi'an, China**

- BEng in Software Engineering Sep 2022 – Jun 2026
- Overall Comprehensive Assessment: 99.9/100 (Rank 1/257); Academic Average: 89.6/100
- English: CET-6 616; IELTS 7.5; First Prize, National English Competition for College Students (NECCS)
- Research Mentor: Prof. Dian Shao, Unmanned Systems Research Institute, NPU (AI algorithms for UAVs, Embodied AI, cognitive intelligence, video understanding)

RESEARCH EXPERIENCE (Research Interests: embodied intelligence, UAV VLN, UAV 3D spatial understanding, intelligent video understanding)

***Team Member,* Academic Project: Integrating Fine-grained Cognitive Modules for Zero-shot UAV Vision-Language Navigation & Benchmark** Feb 2025 – Present

- Open Research Project, National Key Laboratory of Unmanned Aerial Vehicle Technology; Supervisors: Prof. Dian Shao (NPU), Prof. Jieqi Shi (NJU)
- Overview: Targeted Vision-and-Language Navigation (VLN) for Unmanned Aerial Vehicles, integrating multiple LLM/VLM-based cognitive modules. Designed prompting strategies to leverage mid-sized models and realised information exchange via interactions among cognitive modules. In parallel, constructed a high-quality fine-grained dataset. Achieved performance surpassing existing zero-shot methods on the AerialVLN benchmark.
- Contributions:
  - Fine-grained dataset construction: Performed quality filtering on AerialVLN, conducted instruction sentence-level annotation, and refined referring expressions, producing a sub set of c. 5,000 items.
  - Metric design: Designed evaluation metrics at both the overall instruction level and the sentence level for fine-grained UAV VLN.
  - Participated in the writing of three papers, which were accepted by ICAUS 2025 (EI-indexed), submitted to CVPR 2026, and submitted to "Acta Aeronautica et Astronautica Sinica" (EI-indexed).

***Team Member,* Academic Project: Fine-grained Action Recognition under Temporal Corruption via Skeleton Decomposition and Sequence Completion** Dec 2024 – Aug 2025

- Supervisor: Prof. Dian Shao (NPU)
- Overview: Addressing Fine-grained Action Recognition under Temporal Corruption in skeleton sequences, proposed FineTec, a unified framework integrating context-aware sequence completion, skeleton-based spatial decomposition and physics-driven acceleration modeling; constructed the Gym288-skeleton dataset with 38K fine-grained annotations. Achieved 89.1% and 78.1% Top-1 accuracy on Gym99-severe and Gym288-severe.
- Contributions:
  - Fine-grained dataset construction: Completed annotations for 12K segments of competitive sports videos based on Gym99, forming a extended fine-grained skeleton posture dataset Gym288-skeleton.
  - Algorithm design: Co-designed the fine-grained action recognition architecture; implemented the skeleton sequence completion module using in-context learning and multi-mask strategies.
  - Participated in the writing of a paper, which was accepted by AAAI 2026.

***Team Leader,* College Students' Innovative Training Program: Public Transport Anomaly Diagnosis and Optimisation System based on Spatio-temporal Causality** Jun 2024 – Dec 2024

- Overview: Aggregated multi-source transport and urban data; built an governance pipeline — causal representation, anomaly detection, root-cause tracing, and assistant Q&A — leveraging ST-GNN.
- Achievements: Won "Challenge Cup" 2024 "Revealing-the-List" Special Track — Second Prize.
- Contributions: Designed seven categories of metrics across multi-source data; developed the web system using Vue.js Framework.

ACADEMIC ACHIEVEMENTS

Publications (see Research Experience for details)

- Shao, D., Shi, M., **Liu, L**. (2026). FineTec: Fine-Grained Action Recognition under Temporal Corruption via Skeleton Decomposition and Sequence Completion. In Proceedings of the 40th AAAI Conference on Artificial Intelligence (AAAI 2026).
- Shao, D., **Liu, L**., Xu, Z., Bai, J. (2026).Vision-and-Language Navigation for Unmanned Systems: Progress and Perspectives. In Proceedings of the 5th International Conference on Autonomous Unmanned Systems (ICAUS 2025) (EI indexed).
- Shao, D., Xu, Z., Wang, P., **Liu, L**., Wang, Y., Shi, J., Huo, J. (2025). FineCog-Nav: Integrating Fine-grained Cognitive Modules for Zero-shot Multimodal UAV Navigation. Submitted to CVPR 2026.
- Shao, D., Tang, C., Chang, M., Liu, L., Wang, Y., Li, H., & Bai, J. (2025). Advances and outlook on large model–enabled intelligent unmanned aerial vehicles. Submitted to Acta Aeronautica et Astronautica Sinica.

Invention Patents

- Shao, D., Shi, M., Bai, J., Xu, S., Chen, H., Huang, Y., & **Liu, L.** (2025). Fine-grained human motion generation method based on physical laws and skeleton guidance. Granted, No. CN120088442B.
- **Liu, L.**, Sun, B., & He, L. (2025). Humanoid robot navigation method using a hybrid fuzzy neural network and adaptive PID control algorithm. Published, No. CN120385341A.
- Shao, D., Xu, Z., Wang, P., **Liu, L.**, Shi, J., Wang, Y., & Huo, J. (2025). Zero-finetuning vision-language navigation method for UAVs via integration of fine-grained cognitive modules. Application pending.
- Shao, D., Shi, M., & **Liu, L.** (2025). Fine-grained action recognition under temporally corrupted sequences via skeleton decomposition and sequence completion. Application pending.

Translated Monograph

- Henze, B. (2026). Whole-Body Control for Multi-Contact Balancing of Humanoid Robots: Design and Experiments (He, L., Ma, Y., **Liu, L.**, & Shi, Y., Trans.). Beijing: National Defense Industry Press.

Software Copyrights

- **Liu, L.**, & Li, H. (2023). Time-window constrained multi-node path planning system. No. 12125321.
- Li, Y., **Liu, L.**, & Li, H. (2024). UAV-enabled low-altitude logistics planning system. No. 13950938.
- **Liu, L.**, Zhang, S., Li, Z., et al. (2025). GTD-based task assignment and management system. No. 15861786.

SELECTED HONORS & AWARDS

Competitions (software development, mathematical modelling, English speaking)

International/National (16)

- MCM/ICM 2024 & 2025 — Honourable Mention
- NECCS 2023 — First Prize
- Global Campus AI Algorithm Elite Challenge 2024 (Finals) — First Prize
- National Robot Championship & Humanoid Robot Olympiad 2024 (Finals)— First Prize
- "Challenge Cup" 2024 "Revealing-the-List" Special Track (Finals) — Second Prize
- International Advanced Robotics & Simulation Tech Competition 2024 (Finals) — Second Prize

Provincial (22)

- FLTRP • Guocai Cup (Interpreting) 2023 (Shaanxi) — Gold Prize
- China International College Students' Innovation Competition 2024 (Shaanxi) — Gold Prize
- National 3D Digital Innovation Design Competition 2024 (Shaanxi) — First Prize
- National Mathematical Modelling Contest 2024 (Shaanxi) — First Prize

Titles (volunteering, social practice)

- Provincial Outstanding Volunteer, 2024 & 2025
- NPU Outstanding Student, 2023 & 2024

Scholarships

- NPU First-class Scholarship (Top 5%), 2023 & 2024
- "Multi-div. Vision" Scholarship (1 per school), 2024
- "Ningbo Future Star" Scholarship (1 per school), 2025

INTERNSHIP AND PRACTICAL TRAINING

- QingCloud Technology — Wuhan R&D Centre — AI Development Engineer (Intern) — Jul 2024 – Aug 2024
- COP29 (29th UN Climate Change Conference) — Student Representative of NPU — Nov 2024
- AAAI 2026 & CVPR 2026 — Reviewer — Aug 2025 – Nov 2025
- NPU Courses (C Programming, Intro. to AI, Intelligent Robots) — Teaching Assist. — 2024 – 2025