

Xintong Zhang

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RESEARCH INTEREST

Embodied AI, Vision-and-Language Navigation, Multi-Agent Planning, and Multimodal Large Language Models

EDUCATION

Duke Kunshan University (DKU) & Duke University Dual Degree

Aug 2023-May 2027

Major: Applied Mathematics and Computational Sciences / Computer Science

Kunshan, China/Durham, USA

- GPA: 3.976/4.0
- Class Ranking: Top 5%
- Dean's List with Distinction (2023 Fall, 2024 Spring, 2024 Fall, 2025 Spring, 2025 Fall), Dean's List (2026 Spring)
- Courses: Artificial Intelligence, Principles of Machine Learning, Algorithm Design and Analysis, Computer Network, Numerical Analysis, Operating System, Discrete Math for Computer Science, Computer Architecture, Computer Organization and Programming, Linear Algebra, Probability, Calculus, Physics

SELECTED PUBLICATIONS AND MANUSCRIPTS

- Kunhui Wang*, **Xintong Zhang***, Junyu Gao, Changsheng Xu, "ForeFly: A Dual-Horizon World Action Model for Aerial Vision-Language Navigation," *The Fifteenth International Conference on Learning Representations (ICLR 2027)*. Under Review
[Paper](#)
- Kunhui Wang, **Xintong Zhang**, Yufan Hu, Yang Yang, and Junyu Gao, "MoARFly: Learning Motion-Aware Action Refinement for Aerial Vision-Language Navigation," *IEEE Transactions on Multimedia (TMM)*. Under Review
- Junfeng Chen, Yuxiao Zhu, An Zhuo, **Xintong Zhang**, Shuo Zhang, Guanghui Wen, Xiwang Dong, Meng Guo, Zhongkui Li, "Melding LLM and temporal logic for reliable human-swarm collaboration in complex environments," *npj Robotics*. Under Review
[Paper](#) [Project](#) [Page](#) [Video](#)
- **Xintong Zhang***, Junfeng Chen*, Yuxiao Zhu, Bing Luo and Meng Guo, "CoCoPlan: Adaptive Coordination and Communication for Multi-robot Systems under Continual Temporal Tasks," *Robotics and Automation Letters (RA-L)*. Accepted
[Paper](#) [Project](#) [Page](#) [Video](#)
- Yuxiao Zhu*, Junfeng Chen*, **Xintong Zhang**, Meng Guo and Zhongkui Li, "DEXTER-LLM: Dynamic and Explainable Coordination of Multi-Robot Systems in Unknown Environments via Large Language Models," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2025)*. Accepted
[Paper](#) [Project](#) [Page](#) [Video](#)
- Junfeng Chen, Yuxiao Zhu, **Xintong Zhang**, Bing Luo and Meng Guo, "SLEI3D: Simultaneous Large-scale 3D Exploration Inspection and Interaction via Heterogeneous Fleets under Limited Communication," *IEEE Transactions on Automation Science and Engineering (TASE)*. Accepted
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RESEARCH EXPERIENCE

Institute of Automation, Chinese Academy of Science — Undergraduate Researcher

Supervisors: Prof. Junyu Gao, Prof. Changsheng Xu

1. ForeFly: A Dual-Horizon World Action Model for Aerial Vision-Language Navigation (ICLR: Under Review)

May 2026-Now

Co-First Author

Beijing & Kunshan, China

- Designed the Foresight-Guided Action Refinement (FGAR) to incorporate predicted proximal and route-critical future-world representations into action generation, improving the use of future information for both local motion continuity and long-horizon navigation.
- Developed image reconstruction visualizations using Stable Diffusion v1-5 to analyze predicted future representations.
- Conducted extensive experiments and ablation studies and performed both quantitative and qualitative evaluations.
- The method achieved state-of-the-art performance (41.75% success rate) on the widely used TravelUAV benchmark.

2. MoARFly: Learning Motion-Aware Action Refinement for Aerial Vision-Language Navigation (TMM: Under Review)

Apr 2026-Aug 2026

Second Author

Beijing, China

- Contributed to the design of the Dual-Query Transformer architecture, integrating visual, motion, action-query, and language representations.
- Conducted experimental analysis and contributed to manuscript writing.

Peking University — Undergraduate Researcher
Supervisor: Prof. Meng Guo

- LLM-Driven Planning and Coordination for Heterogeneous Multi-Robot Systems** Jan 2025-Mar 2026
Publications: DEXTER-LLM, IROS; Melding LLM and temporal logic (Under Review) Beijing & Kunshan, China
 - Developed LLM-assisted task-planning frameworks for heterogeneous multi-robot systems in unknown environments, integrating LLM-based high-level reasoning with model-based optimization for explainable and reliable coordination.
 - Designed a mixed-integer linear programming (MILP)-based task allocation algorithm using Gurobi and developed structured prompt templates for LLM-based subtask generation and reasoning.
 - Conducted physical hardware experiments by deploying planning algorithms on physical robot systems involving 2 UAVs, 4UGVs and 2 quadruped robots, enabling real-world validation of the proposed planning framework.
- CoCoPlan: Adaptive Coordination and Communication for Multi-robot Systems under Continual Temporal Tasks (RAL: Accepted)** Jan 2025-Aug 2025
Leading Author Beijing & Kunshan, China
 - Led the design of a framework that co-optimizes task planning and intermittent communication based on a BnB architecture and proposed an adaptive objective function that balances task efficiency against communication latency.
 - Developed a communication planning approach combining tree-search methods and nonlinear iterative optimization, supporting 2D and 3D environments, regular/irregular obstacles, and scenarios with up to 100 agents in 15 seconds.
 - Conducted hardware experiments in 138*114*3 m³ long narrow corridor environment with 4 UGVs, and 16*14*26 m³ disaster environment with 2 UAVs and 4UGVs.
- SLEI3D: Simultaneous Large-scale 3D Exploration Inspection and Interaction via Heterogeneous Fleets under Limited Communication (TASE: Accepted)** May 2024-Dec 2024
Third Author Beijing & Kunshan, China
 - Designed a multi-layer, multi-rate coordination framework for heterogeneous UAV/UGV teams, jointly optimizing exploration, inspection, and inter-robot communication.
 - Implemented low-level robot motion planning in C++ and high-level planning/optimization algorithms in Python, including TSP, multi-vehicle routing, and genetic algorithms.
 - Conducted large-scale 3D simulations with up to 48 robots in a 384,000 m³ environment in RViz, and performed hardware experiments with 4 Crazyflie UAVs, 2 Tello UAVs, and 1 UGV.

COURSE PROJECTS

- Duke University** — Research Independent Study
Development of Multi-Agent Simulation Environment Powered by Large Language Models Sep 2025–Dec 2025
Supervisor: Prof. Boyuan Chen Durham, NC, USA
- Developed a LLM powered framework that allows users to specify operational areas, heterogeneous agents, tasks, constraints, and task-allocation strategies for customized multi-agent collaboration problems.
 - Integrated LLMs for strategy validation, semantic task decomposition, and capability-aware subtask assignment, connecting high-level natural-language problem specifications with executable agent behaviors in a structured grid world.
 - Implemented multi-agent task execution and quantitative strategy evaluation and evaluated the framework across diverse scenarios including chemical-plant emergency response, medical operations, and office coordination.

ACADEMIC ACTIVITIES & SERVICES

Reviewer: RAL 2026, **Conference Participation:** IROS 2025, ICRA 2026
Teaching Assistant: DKU COMPSCI101: Introduction into Computer Science (2024 Fall)

HONORS & AWARDS

Dean's List (2026 Spring) – DKU May 2026
Dean's List with Distinction (2023 Fall, 2024 Spring, 2024 Fall, 2025 Spring, 2025 Fall) – DKU 2023-2025
National Encouragement Scholarship - Jiangsu Provincial Department of Education Dec 2025
Student Experiential Learning Fellow (SELF) – DKU Apr 2025
Signature Fund (SF) – DKU Apr 2025
National-Level College Student Innovation and Entrepreneurship Project - Organizing Committee of the Jiangsu Provincial College Student Innovation and Entrepreneurship Outstanding Achievement Exchange and Exhibition Apr 2024

Skills

Python, Java, C++, LaTeX, Gurobi, Unreal Engine, Airsim, OpenCV, ROS (Robot Operating System), Linux, Git, Robot Hardware (Motive, Crazyfly UAV, Tello UAV, SCOUT UGV), Blender