

MA Jianfa

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EDUCATION

Southern University of Science and Technology
B.E. in Computer Science and Technology

- GPA: 3.6 / 4.0
- Core Courses: Artificial Intelligence; Intelligent Robotics; Operating Systems; Software Engineering; Computer Vision

Shenzhen, Sep 2022 – Jun 2026

The Chinese University of Hong Kong
M.Sc. in Computer Science (Fall 2026 intake)

(expected) Hong Kong, Sep 2026 - Jun 2027

The Hong Kong Polytechnic University
Semester Exchange Program under Department of EEE

- Program & Course: Artificial Intelligence Engineering; Deep Learning; Multimedia Communication; Web System and Technology

Hong Kong, Sep – Dec 2025

National University of Singapore
Summer Research Program in School of Computing

- Project: a deep dive in Visual Computing studies, with research and exercise on traffic sign recognition in extreme scenarios

Singapore, Jul – Aug 2024

PUBLICATIONS

G. Lan*, **J. Ma***, Z. Zhao, Q. Qi, Y. Liu & Q. Hao. RoGaussianOCC: A Gaussian Fusion Method for Accurate and Robust Occupancy Prediction in Autonomous Driving. *Information Fusion*. (Under Review, Jan. 2026) (Co-first Author)

X. Chen, Z. Liu, **J. Ma**, B. Du, T. Zhang, X. Wang & B. Zhou. AirHunt: Bridging VLM Semantics and Continuous Planning for Efficient Aerial Object Navigation. *IEEE Robotics and Automation Letters*. (Under Review, April. 2026)

WORK & RESEARCH EXPERIENCE

AirHunt: Bridging VLM Semantics and Continuous Planning for Efficient Aerial Object Navigation

- Research Intern | Supervisor: Prof. Boyu Zhou**
– To develop a real-time aerial navigation system capable of objects navigation in large-scale, unknown outdoor environments based on natural language commands
- ACHIEVEMENT** – 1) Achieved a **78% navigation success rate** in AirSim, representing a 204% performance improvement over the baseline model, and reaching 98% of human performance; 2) Validated effectiveness and feasibility of *AirHunt* on a custom-built quadrotor through over **10 hours** of objects navigation experiments in **diverse real-world scenarios**
- CONTRIBUTION** – 1) Conducted research on the latest work about Vision Language Navigation and proposed research question; 2) Designed and implemented a high-frequency geometric navigation path planner, a low-frequency VLM semantic scoring module and a ROS based cross-modules communication system; 3) Implemented baseline models and conducted ablation studies in AirSim

Apr – Oct 2025
OBJECTIVE

RoGaussianOCC: An Accurate and Robust Gaussian Occupancy Prediction in Autonomous Driving

- Research Leader | Supervisor: Prof. Qi Hao & Dr. Gongjin Lan**
OBJECTIVE – To develop a robust 3D Gaussian occupancy prediction model for vision-based autonomous driving in extreme environment by tackling the following limitations: 1) Inefficient Gaussian representation due to random initialization; 2) Imprecise prediction under occlusion caused by a single-frame framework; 3) Sparse supervision signals hindering early convergence
- ACHIEVEMENT** – 1) Achieved a **32.20% IoU** and **20.65% mIoU** in occupancy prediction on nuScenes datasets, with a **7.95%** and **8.12%** relative improvement over baseline models; 2) Validated sub-modules effectiveness and contribution to overall performance by ablation study, and validated robustness by quantitative and qualitative experiments on an extreme-task dataset
- CONTRIBUTION** – 1) Conducted related work research and identified limitations of existing work through experiments; 2) Proposed and implemented Gaussian4DOCC framework to tackle proposed limitations; 3) Performed model training, parameter tuning, and effectiveness evaluation through ablation studies and visualization analysis

Sep 2024 – Apr 2025

Natural Language Instructions Based 3D Cross-Modal Perception System for UAVs
Core Member | Supervisor: Prof. Feng Zheng

- OBJECTIVE** – To develop a generalized embodied UAV agent, leveraging VLM to enable natural language instruction and interaction
- CONTRIBUTION** – 1) Conducted research on 3DLLM, trained and finetuned models for UAV agent interaction tasks; 2) Finetuned VLM to generate waypoints for exploration tasks; 3) Developed the UAV platform's ROS system and deployed the model on UAVs

Dec 2023 – Sep 2024

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COMPETITIONS & AWARDS

Excellent Creativity Award (Second Place), Meituan 3rd Low-Altitude Economy Intelligent Flight Management Challenge *Sep 2025*
Third Prize, Guangdong Contemporary Undergraduate Mathematical Contest in Modelling 2023 *Dec 2023*

SKILLS

Languages	Fluent in English (TOEFL 102), Cantonese; Native in Mandarin
Programming	Python, Java, C/C++, MATLAB, SQL
Frameworks & Tools	OpenCV, PyTorch, ROS, MNCV, TensorRT, AirSim, Unreal Engine, Nvidia Jetson, Git
Datasets & Benchmarks	nuScenes, KITTI, AirSim Simulation Environment
Expertise	3D Scene Perception & Occupancy Prediction; Gaussian-based Representation & Fusion UAV Navigation, Motion Planning & SLAM; VLM Fine-tuning & Deployment Embodied Agent System Development