# Zihan Lin

Agent Application Development / Robotics Software

zzzhlin@gmail.com | zihanlin.com | github.com/SuperChipper

## Education

**University College London (UCL)** **2025 – 2026**

*MSc* Computer Graphics, Vision and Imaging Average 77.46/100 (**Distinction**)

**South China University of Technology (SCUT) & University of Birmingham (UoB)** **2021 – 2025**

*2+2 undergraduate programme* Robotics Engineering / Electronic and Electrical Engineering

GPA: 3.45/4.00 First-Class Honours, University of Birmingham

## Technical Skills

- **Programming:** C++, Python, TypeScript; Git, Linux, Node.js; project experience with Java and SQL.
- **Agent applications:** deepseek-harness tools, JSON Schema, prompt/context design, BM25 retrieval, sub-agent failover.
- **Robotics and models:** ROS2, OpenCV, ORB-SLAM3; PyTorch, NumPy, SciPy; pose transforms, point-cloud fusion.

## Projects

**DSH Dungeon Master: Stateful Multiplayer AI Game Master** **Personal open-source project**

*Extends deepseek-harness and a QQ plugin with D&D rule tools, state handling and a web panel* TypeScript, Node.js, Vitest

github.com/SuperChipper/dsh-dungeon-master npm: `dsh-dungeon-master`

- Implemented 17 D&D 5e rule tools and an extensible rule engine that keeps LLM narration separate from dice, game state and 2.5D grid pathfinding, with safe hot registration of custom formulas. Actions are checked against player identity, turn and character delegation; persisted pending state and one-time approvals let a session recover after interruptions.
- Each group's JSON save, written atomically, is the single source of truth, so a game can roll back to a given step or dice roll and pause atomically. Tool calls in the same turn reuse one context snapshot instead of re-injecting it; local BM25 with Chinese tokenisation recalls shared notes across sessions.
- Split the narration agent from a combat-only sub-agent with three-level automatic fallback. Built web settings and persona panels, upgrade self-checks and host-adapter boundary tests; published on **npm** and listed in **Awesome DSH Plugin**.

**Robot Task Control and Communication** **2022.09 – 2024.07**

*Robocon team, upper-computer logic and communication* C++, state machines, serial communication

- Wrote the upper-computer C++ task state machine and a fixed-length serial protocol that coordinates movement, ball pickup and placement through action types and parameters. Stopping was decided from position feedback against the target; took part in integration and on-site debugging.
- Separated serial acknowledgement from physical completion so that no move was sent before a ball release had finished. Release was confirmed by action timing plus an overhead camera check, with automatic retry before moving to the next task.

**Generalised Deep Null-Space Networks for Image Reconstruction** **2026.06 – 2026.09**

*MSc dissertation* Python, PyTorch, convex optimisation, residual learning

- Replaced the pseudo-inverse base reconstruction with a minimum total-variation (TV) selector via finite-iteration PDHG, followed by a residual U-Net and a second selector subtraction that keeps data consistency under an exact operator.
- Used the TV selector for data generation and output correction. In noise-free simulation, mean **PSNR rose by 1.27 / 1.66 dB** over the selector baseline on the BSDS500 compressed-sensing test set and the fastMRI magnitude $R = 4$ validation set.

**Dense 3D Reconstruction with ORB-SLAM3** **2024.10 – 2025.06**

*Undergraduate dissertation* C++, SLAM, 3D reconstruction

- Built an RGB-D dense reconstruction pipeline on ORB-SLAM3 with an OAK-D Pro, implementing depth back-projection, world-coordinate transforms, keyframe point-cloud fusion and voxel down-sampling myself.
- Built the map from framework poses and keyframes, and rebuilt the global point cloud from saved keyframe RGB-D data after relocalisation or loop-closure pose corrections.

## Experience

**Lixun Technology (力迅科技) | Software Development Intern** **2025.06 – 2025.09**

*Service project for the Guangdong Emergency Warning Release Centre* Java, MyBatis-Flex, XuguDB

- Implemented weather-message decoding and database transactions with MyBatis-Flex, and wrote XuguDB SQL for hourly, daily and monthly aggregation. Deployed the system on site and fixed message-parsing and database-compatibility issues.

## Honours and Languages

ROBOCON, China University Robot Competition First Prize / Third Prize 2024.07 / 2023.07

Guangdong Undergraduate Electronic Design Contest Third Prize 2022.08

English: IELTS 7.0 Mandarin: native