

# Liu Dai

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## Research Interest

My research focuses on Embodied AI. My goal is to build active and intelligent agents in the real and open world, through developing both stronger agent skills and more powerful simulators for embodied tasks.

## Education

### Tongji University

B.ENG. IN COMPUTER SCIENCE, COLLEGE OF ELECTRONIC & INFORMATION ENGINEERING

- GPA: 88.0 / 100, Overall Ranking: 10 / 120

Shanghai, China

Sep. 2019 - Jun. 2024 (expected)

### University of California San Diego

VISITING STUDENT SCHOLAR AT SU LAB, JACOBS SCHOOL OF ENGINEERING

- Advisor: [Prof. Hao Su](#)

California, USA

Mar. 2023 - Present

### Peking University

VISITING STUDENT SCHOLAR AT CENTER ON FRONTIERS OF COMPUTING STUDIES

- Advisor: [Prof. He Wang](#)

Beijing, China

Mar. 2022 - Present

## Publication

\*: equivalent contribution, †: corresponding author(s)

### [C2] 3D-Aware Object Goal Navigation via Simultaneous Exploration and Identification [\[Paper Link\]](#)

Jiazhao Zhang\*, Liu Dai\*, Fanpeng Meng, Qingnan Fan, Xuelin Chen, Kai Xu, He Wang†

Accepted to *IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR) 2023*

### [C1] Discovering Novel Categories in SAR Images in Open Set Conditions [\[Paper Link\]](#)

Liu Dai, Weiwei Guo†, Zenghui Zhang, Wenxian Yu

Accepted to *IEEE/GRSS International Geoscience and Remote Sensing Symposium (IGARSS) 2022, Oral*

## Research Experience

### University of California San Diego

RESEARCH INTERN AT SU LAB, ADVISED BY [PROF. HAO SU](#)

California, USA

Mar. 2023 - Present

#### Project: Environment Generation and Construction for Full-Physical Simulation of Embodied AI Tasks [On-Going]

- Aim to build interactive simulation environment which is rich in scene layouts and object diversity for full-physical embodied AI tasks.

### Peking University

RESEARCH INTERN AT EPIC LAB, ADVISED BY [PROF. HE WANG](#)

Beijing, China

Mar. 2022 - Present

#### Project: Active 3D Scene Understanding & Object Goal Navigation [C2]

- Proposed the first 3D-aware framework for the challenging Object Goal Navigation task, empowered by two simultaneously running sub-policies: corner-guided exploration policy and category-aware identification policy. By this dedicated design, we overcame the challenge of low sample efficiency in RL and high computational cost when leveraging 3D data for training navigation skills.
- I conducted part of method design, coding, writing and the most of plotting. This project piqued my interest in Embodied-AI and comprehensively improved my ability in coding, writing and plotting.

#### Project: Mobile Manipulation in Real World [On-Going]

- Aim to build active agents with strong navigation and manipulation skills in the real world.

### Tongji-MIT City Science Lab

RESEARCH INTERN, ADVISED BY [PROF. WEIWEI GUO](#)

Shanghai, China

Sep. 2021 - Mar. 2022

#### Project: Remote Sensing Image Interpretation in the Open & Challenging World [C1]

- Proposed a multi-stage framework for Novel Category Discovery of remote sensing images: first self-supervisedly train a representation extractor, taking the best of both worlds of the labelled and unlabelled data, and then estimate the number of novel classes and cluster the unknown data based on open-set detection.
- This is the first research project I had and it piqued my research interest in the setting of Open-World. I undertook the most of coding, writing and plotting independently.

## Teaching

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### Course 55010501: Opensource Hardware and Programming

Tongji University

TEACHING ASSISTANT FOR PROF. XIAOHUA SUN IN COLLEGE OF DESIGN AND INNOVATION

2021 Fall

- Delivered courses on Python & Arduino, guided undergraduate students to design and implement their Art projects through coding.

## Honors & Awards

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### PERSONAL HONORS

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|------|---|--------------------|
| 2023 | <b>Pursuit of Excellence Scholarship</b> with 50000¥ (≈7000\$)<br>– Highest Honor for All Members of Tongji University (10/43106, among faculty, students & admin staff). | Tongji University  |
| 2022 | <b>SenseTime Scholarship</b> with 20000¥ (≈3000\$)<br>– Nationwide Selected 30 Undergraduates in the Field of AI.   | SenseTime Co.,Ltd. |
| 2022 | <b>Tongji Academic Star</b><br>– Highest Honor for All Undergrads at Tongji University (15/18536).  | Tongji University  |

### COMPETITION ACHIEVEMENTS

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|------|--|
| 2021 | <b>National First Prize</b> of <i>Challenge Cup</i> Competition: Research Track<br><b>Project:</b> We built a pest detection system based on deep learning to help the agricultural workers in the less-developed rural area in China, where there is a great lack of experts on pest detection and the farmhand could only diagnose based on some folk prescription before.<br>– Most Influential Research Competition among University Students in China.<br>– Best Record in College History.<br>– Team Leader. |
| 2023 | <b>National Silver Award</b> of <i>Challenge Cup</i> Competition: Entrepreneurship Track<br>– Best Record in College History.<br>– Team Leader.  |
| 2022 | <b>Gold Award in Shanghai</b> of <i>Internet+</i> Competition<br>– Team Leader.  |
| 2020 | <b>University Champion</b> of <i>FLTRP Cup</i> National English Public Speaking Contest  |

## Skills

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|--------------------|--|
| <b>Programming</b> | C/C++, Python, LaTeX, HTML & CSS, SQL, Arduino, Bash       |
| <b>Frameworks</b>  | Pytorch, NumPy, OpenCV, Open3D, trimesh, Habitat Simulator |
| <b>Others</b>      | Public Speaking and Presentation                           |

## Languages

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|----------------|-------------|
| <b>Chinese</b> | Native      |
| <b>English</b> | Fluent      |
| <b>French</b>  | Preliminary |

## Entrepreneurship

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I am the co-founder of **LunarAI**, an AI-Empowered Start-Up for Modern Agriculture.