

# Runmao Yao

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## Education

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|--|--------------------------------|
| <b>Carnegie Mellon University</b> , Master of Science in Computer Vision | Aug 2025 – Dec 2026 (expected) |
| <b>Tsinghua University</b> , B.Eng. in Software Engineering              | Sept 2021 – Jun 2025           |
| • GPA: 3.83/4.00 (92.16/100)   |                                |
| – Freshman: 3.55/4.00  | Sophomore: 3.90/4.00           |
| – Junior: 3.98/4.00  | Senior: 4.00/4.00              |

## Publications

|   |           |
|---|-----------|
| [1] <b>AirRoom: Objects Matter in Room Reidentification</b> (arXiv <a href="#">🔗</a> )  | CVPR 2025 |
| <i>Runmao Yao</i> , Yi Du, Zhuoqun Chen, Haoze Zheng, Chen Wang   |           |
| [2] <b>SuperPC: A Single Diffusion Model for Point Cloud Completion, Upsampling, Denoising, and Colorization</b> (arXiv <a href="#">🔗</a> ) | CVPR 2025 |
| Yi Du, Zhipeng Zhao, Shaoshu Su, Sharath Golluri, Haoze Zheng, <i>Runmao Yao</i> , Chen Wang  |           |

## Research Experiences

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|---|----------------------------|
| <b>Indoor Scene Generation from Single Views (3D Computer Vision)</b> | <i>Tsinghua University</i> |
| Supervisor: Prof. Yu-Shen Liu <a href="#">🔗</a>                       | Dec 2024 – Jun 2025        |

- **Task:** Generate a complete indoor scene from a single RGB input image.
- Introduced an indoor scene geometry prior to enforce regular structural patterns.
- Proposed a novel warp-and-inpaint framework leveraging diffusion models to synthesize complete indoor scenes while preserving both structural coherence and stylistic consistency.
- Completed the undergraduate thesis.

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|---|------------------------------|
| <b>Room Reidentification (Computer Vision for Robotics)</b> | <i>University at Buffalo</i> |
| Supervisor: Prof. Chen Wang <a href="#">🔗</a>               | Jul 2024 – Feb 2025          |

- **Task:** Retrieve the most similar room image from a large database given a query room image.
- Curated four comprehensive room reidentification datasets (MPReID, HMReID, GibsonReID, and ReplicaReID) with over 35000 images across diverse environments.
- Proposed AirRoom, an object-aware, coarse-to-fine pipeline integrating multi-level object information, from global context to object patches, segmentation, and keypoints.
- Extensive experiments demonstrated that AirRoom outperformed state-of-the-art models by 6% to 80% across nearly all evaluation metrics and exhibited robust performance under diverse viewpoint variations.

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|---|----------------------------|
| <b>Skill Discovery (Reinforcement Learning)</b> | <i>Tsinghua University</i> |
| Supervisor: Prof. Yi Wu <a href="#">🔗</a>       | Mar 2024 – Aug 2024        |

- **Task:** Enable agents to learn diverse skills, where each skill corresponds to a distinct behavior.
- Reproduced key results from previous works, including LSD, CSD, and METRA.
- Proposed a novel approach by designing rewards based on trajectory segments rather than individual states.
- Developed an on-the-fly trajectory predictor and evaluator leveraging FLD.

## Awards and Honors

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|---|--------------------|
| <b>Second Prize Scholarship for Incoming Students</b> , Tsinghua University | Dec 2021           |
| <b>Third Prize in the Software Competition</b> , Tsinghua University        | Jan 2022, Jun 2023 |
| <b>Outstanding Admission Volunteer</b> , Tsinghua University                | Jul 2022           |
| <b>Sports Excellence Award</b> , Tsinghua University                        | Sep 2022           |
| <b>Comprehensive Excellence Award</b> , Tsinghua University (Top 15%)       | Sep 2023, Sep 2024 |

## Skills

**Programming:** C, C++, Python, Java, HTML, CSS, JavaScript  
**Techniques:** Pytorch, Mujoco, Docker, Git  
**Languages:** English(Proficient), Chinese(Native)