Yongsen Mao

🌐 https://sammaoys.github.io   ✉ sammaoys@outlook.com
⌾ https://github.com/SamMaoYS   ☎ +86 189-5870-5118

Education

Simon Fraser University, Canada   *Jun 2021 – Oct 2023*
Computing Science, M.Sc.

Simon Fraser University, Canada   *Sep 2016 – Jun 2021*
Computing Science, B.Sc.

Zhejiang University, China   *Sep 2016 – Jun 2021*
Computer Science and Technology, B.Eng.

Research Interest

Bridging Synthetic & Real-world Data   3D Scene Understanding   Controllable Diffusion Generation

Publications

Ego-Exo4D: Understanding Skilled Human Activity from First- and Third-Person Perspectives

*Kristen Grauman, Andrew Westbury, Lorenzo Torresani, Kris Kitani, Jitendra Malik, Triantafyllos Afouras, Kumar Ashutosh, Vijay Baiyya, Siddhant Bansal, Bikram Boote, Eugene Byrne, Zach Chavis, Joya Chen, Feng Cheng, Fu-Jen Chu, Sean Crane, Avijit Dasgupta, Jing Dong, Maria Escobar, Cristhian Forigua, Abrham Gebreselasie, Sanjay Haresh, Jing Huang, Md Mohaiminul Islam, Suyog Jain, Rawal Khirodkar, Devansh Kukreja, Kevin J Liang, Jia-Wei Liu, Sagnik Majumder, **Yongsen Mao**, Miguel Martin, Effrosyni Mavroudi, Tushar Nagarajan, Francesco Ragusa, Santhosh Kumar Ramakrishnan, Luigi Seminara, Arjun Somayazulu, Yale Song, Shan Su, Zihui Xue, Edward Zhang, Jinxu Zhang, Angela Castillo, Changan Chen, Xinzhu Fu, Ryosuke Furuta, Cristina Gonzalez, Prince Gupta, Jiabo Hu, Yifei Huang, Yiming Huang, Weslie Khoo, Anush Kumar, Robert Kuo, Sach Lakhavani, Miao Liu, Mi Luo, Zhengyi Luo, Brighid Meredith, Austin Miller, Oluwatumininu Oguntola, Xiaqing Pan, Penny Peng, Shraman Pramanick, Merey Ramazanova, Fiona Ryan, Wei Shan, Kiran Somasundaram, Chenan Song, Audrey Southerland, Masatoshi Tateno, Huiyu Wang, Yuchen Wang, Takuma Yagi, Mingfei Yan, Xitong Yang, Zecheng Yu, Shengxin Cindy Zha, Chen Zhao, Ziwei Zhao, Zhifan Zhu, Jeff Zhuo, Pablo Arbelaez, Gedas Bertasius, David Crandall, Dima Damen, Jakob Engel, Giovanni Maria Farinella, Antonino Furnari, Bernard Ghanem, Judy Hoffman, C. V. Jawahar, Richard Newcombe, Hyun Soo Park, James M. Rehg, Yoichi Sato, Manolis Savva, Jianbo Shi, Mike Zheng Shou, Michael Wray*

*Computer Vision and Pattern Recognition (**CVPR**), 2024, **Oral***

Project website, Paper, Code

Habitat Synthetic Scenes Dataset (HSSD):
An Analysis of 3D Scene Scale and Realism Tradeoffs for ObjectGoal Navigation

Mukul Khanna, **Yongsen Mao***, Hanxiao Jiang, Sanjay Haresh, Brennan Schacklett, Dhruv Batra, Alexander Clegg, Eric Undersander, Angel Chang, Manolis Savva*

*Computer Vision and Pattern Recognition (**CVPR**), 2024*

Project website, Paper, Code

MultiScan: Scalable RGBD scanning for 3D environments with articulated objects

***Yongsen Mao**, Yiming Zhang, Hanxiao Jiang, Angel X. Chang, Manolis Savva*

*Advances in Neural Information Processing Systems (**NeurIPS**), 2022*

Project website, Paper, Code

OPD: Single-view 3D Openable Part Detection

*Hanxiao Jiang, **Yongsen Mao**, Manolis Savva, Angel X. Chang*

*European Conference on Computer Vision (**ECCV**), 2022, **Oral***

Project website, Paper, Code

Work Experience

KuJiaLe/Coohom link   *Nov 2023 – Present*
Research Engineer (Full Time)   *Hangzhou, China*

- Focus on exploring and understanding controllable diffusion models for interior design
- Developed controllable diffusion models that preserve room structure and automatically furnish rooms with accurate semantic layouts and realistic visual quality. Open-sourced checkpoint Layout-ControlNet on HuggingFace Repo and released a demo on HuggingFace Space
- Designed controllable diffusion models that automatically apply realistic lighting while maintaining the original texture and structure
- Built controllable diffusion models that transform furnished and complex indoor scenes into empty rooms, facilitating easier room layout estimation and understanding
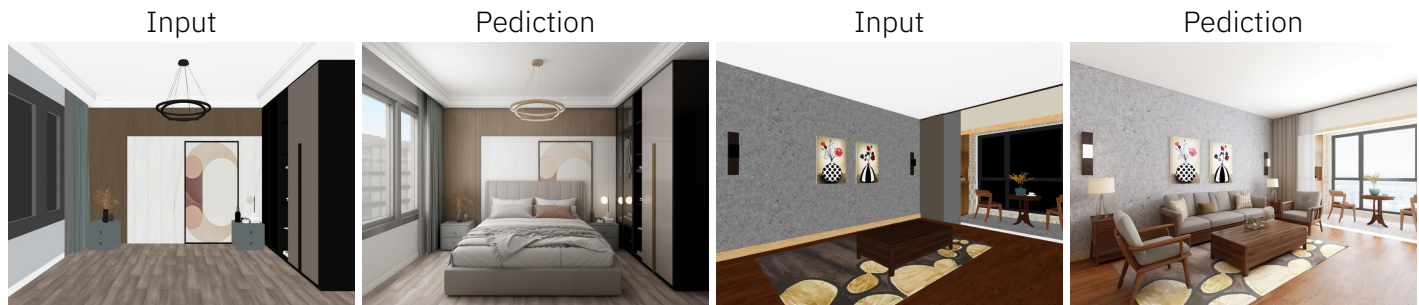
| Input | Pediction | Input | Pediction |

Figure 1: Convert incomplete scenes into fully furnished ones, while preserving texture and structure

DaoAI Robotics Inc. link   *Jan 2020 – Aug 2020*
3D Vision Engineer (Undergraduate Coop)   *Vancouver, Canada*

- Built CAD-based 3D object detection and 6-DoF pose estimation project for Random Bin Picking using point pair features (PPF) based method, the result surpassed the PCL's PPF Estimation implementation in both quantitative and qualitative terms
- Implemented boundary-to-boundary PPF algorithm, enabling the system to detect industrial flat metal sheets
- Accelerated the object pose estimation by using OpenMP and Thrust to achieve parallel PPF computation and matching
- Customized a 3D point cloud, 2D RGB and depth image visualization and interaction widget

Other Projects

SegmentAnyScene: Extends the capabilities of the Segment Anything Model, originally designed for 2D images, to work with 3D scene meshes   *Code Video*

TA Experience

CMPT 361: Introduction to Computer Graphics   *Jan 2022 – Apr 2022*

Honors and Awards

Undergraduate Graduation: Joint Honours with Distinction   *Fall 2021*
Dean's Honour Roll   *Fall 2019*

Activities

SFU-UBC AI Research Day   *Dec 2022*
Present project MultiScan in oral and poster session
CS Research Day   *Dec 2019 – 2022*
Present project MultiScan in poster session