Jing Liang

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Introduction

I'm currently a 5th-year Ph.D. student at the University of Maryland(UMD), College Park. I'm working in the GAMMA lab and supervised by Dr. Dinesh Manocha. I'm focusing on Robotics and Embodied AI, especially robotic navigation and perception.

Work Under-Submission

[1] **Jing Liang**, Dibyendu Das, Daeun Song, Md Nahid Hasan Shuvo, Mohammad Durrani, Karthik Taranath, Ivan Penskiy, Dinesh Manocha, and Xuesu Xiao. *GND: Global Navigation Dataset with Multi-Modal Perception and Multi-Category Traversability in Outdoor Campus Environments*. 2024. arXiv: 2409.14262 [cs.RO]. URL: https://arxiv.org/abs/2409.14262.

[2] **Jing Liang**, Zhuo Deng, Zheming Zhou, Min Sun, Omid Ghasemalizadeh, Cheng-Hao Kuo, Arnie Sen, and Dinesh Manocha. *CSCPR: Cross-Source-Context Indoor RGB-D Place Recognition*. 2024. arXiv: 2407.17457 [cs.CV]. URL: https://arxiv.org/abs/2407.17457.

[3] Daeun Song, **Jing Liang**, Amirreza Payandeh, Xuesu Xiao, and Dinesh Manocha. *VLM-Social-Nav: Socially Aware Robot Navigation through Scoring using Vision-Language Models*. 2024. arXiv: 2404.00210 [cs.RO]. URL: https://arxiv.org/abs/2404.00210.

[4] Daeun Song*, **Jing Liang***, Xuesu Xiao, and Dinesh Manocha. *TGS: Trajectory Generation and Selection using Vision Language Models in Mapless Outdoor Environments*. 2024. arXiv: 2408.02454 [cs.RO]. URL: https://arxiv.org/abs/2408.02454.

[5] Xiyang Wu, Souradip Chakraborty, Ruiqi Xian, **Jing Liang**, Tianrui Guan, Fuxiao Liu, Brian M. Sadler, Dinesh Manocha, and Amrit Singh Bedi. *Highlighting the Safety Concerns of Deploying LLMs/VLMs in Robotics*. 2024. arXiv: 2402.10340 [cs.RO]. URL: https://arxiv.org/abs/2402.10340.

Publications

[1] **Liang, Jing**, Zhuo Deng, Zheming Zhou, Omid Ghasemalizadeh, Dinesh Manocha, Min Sun, Cheng-Hao Kuo, and Sen Arnie. "PoCo: Point Context Cluster for RGBD Indoor Place Recognition". In: *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE. 2024.

[2] **Liang, Jing**, Peng Gao, Xuesu Xiao, Adarsh Jagan Sathyamoorthy, Mohamed Elnoor, Ming C Lin, and Dinesh Manocha. "Mtg: Mapless trajectory generator with traversability coverage for outdoor navigation". In: *2024 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2024, pp. 2396–2402.

[3] **Liang, Jing**, Amirreza Payandeh, Daeun Song, Xuesu Xiao, and Dinesh Manocha. "DTG: Diffusion-based Trajectory Generation for Mapless Global Navigation". In: *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE. 2024.

[4] Laura Zheng, Sanghyun Son, **Jing, Liang**, Wang Xijun, Clipp Brian, and Lin Ming C. "Deep Stochastic Kinematic Models for Probabilistic Motion Forecasting in Traffic". In: *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE. 2024.

[5] Peng Gao, **Liang, Jing**, Yu Shen, Sanghyun Son, and Ming C Lin. "Visual, Spatial, Geometric-Preserved Place Recognition for Cross-View and Cross-Modal Collaborative Perception". In: *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE. 2023, pp. 11079–11086.

[6] Tianrui Guan, Aswath Muthuselvam, Montana Hoover, Xijun Wang, **Liang, Jing**, Adarsh Jagan Sathyamoorthy, Damon Conover, and Dinesh Manocha. "CrossLoc3D: Aerial-Ground Cross-Source 3D Place Recognition". In: *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*. Oct. 2023.

[7] Kasun Weerakoon, Adarsh Jagan Sathyamoorthy, **Liang, Jing**, Tianrui Guan, Utsav Patel, and Dinesh Manocha. "GrASPE: Graph Based Multimodal Fusion for Robot Navigation in Outdoor Environments". In: *IEEE Robotics and Automation Letters* 8.12 (2023), pp. 8090–8097. DOI: 10.1109/LRA.2023.3320013.

[8] **Liang, Jing**, Kasun Weerakoon, Tianrui Guan, Nare Karapetyan, and Dinesh Manocha. "AdaptiveON: Adaptive Outdoor Navigation Method For Stable and Reliable Motions". In: *IEEE Robotics and Automation Letters* (2022).

[9] Adarsh Jagan Sathyamoorthy, Kasun Weerakoon, Tianrui Guan, **Liang, Jing**, and Dinesh Manocha. "Terrapn: Unstructured terrain navigation using online self-supervised learning". In: *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE. 2022, pp. 7197–7204.

[10] Qiaoyun Wu, Jun Wang, **Liang, Jing**, Xiaoxi Gong, and Dinesh Manocha. "Image-Goal Navigation in Complex Environments via Modular Learning". In: *IEEE Robotics and Automation Letters* (2022).

[11] Zhiming Chen, Tingxiang Fan, Xuan Zhao, **Liang, Jing**, Cong Shen, Hua Chen, Dinesh Manocha, Jia Pan, and Wei Zhang. "Autonomous social distancing in urban environments using a quadruped robot". In: *IEEE Access* 9 (2021), pp. 8392–8403.

[12] **Liang, Jing**, Utsav Patel, Adarsh Jagan Sathyamoorthy, and Dinesh Manocha. "Crowd-steer: Realtime smooth and collision-free robot navigation in densely crowded scenarios trained using high-fidelity simulation". In: *Proceedings of the Twenty-Ninth International Conference on International Joint Conferences on Artificial Intelligence*. 2021, pp. 4221–4228.

[13] **Liang, Jing**, Yi-Ling Qiao, Tianrui Guan, and Dinesh Manocha. "OF-VO: efficient navigation among pedestrians using commodity sensors". In: *IEEE Robotics and Automation Letters* 6.4 (2021), pp. 6148–6155.

[14] Aaron M Roth, **Liang, Jing**, and Dinesh Manocha. "XAI-N: Sensor-based Robot Navigation using Expert Policies and Decision Trees". In: *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE. 2021, pp. 2053–2060.

[15] **Liang*, Jing**, Adarsh Jagan Sathyamoorthy*, Utsav Patel, Tianrui Guan, Rohan Chandra, and Dinesh Manocha. "Densecavoid: Real-time navigation in dense crowds using anticipatory behaviors". In: *2020 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2020, pp. 11345–11352.

Education

Ph.D in Computer Science 2020-present
University of Maryland, College Park
M.E. in Robotics 2018-2020
University of Maryland, College Park

Services

Reviewed papers:

I reviewed papers over 30 papers from conferences and journal including IEEE RA-L, IEEE T-RO, IROS (2021-2023), ICRA (2022-2024), SSRR (2021), ISER (2023)

Work Experience

Applied Scientist Intern Jun 2023 - Aug 2024

Amazon Lab 126

– Job Duties: Perform research in the area of robotic localization and navigation

– Submitted three papers about place recognition and 3D semantic scene understanding to IROS 2024, RA-L and ICRA 2025, respectively.

Research/Teaching Assistant Aug 2021 - Present

Computer Science Department, University of Maryland, College Park

– Submitted several papers about robotic navigation and perception to ICRA, IROS, and RA-L;

– Prepared lecture materials, exams and assignments;

– Gave lectures about robotics.

Advanced Engineer April 2020 - Jun 2021

Watermirror Inc, Shenzhen China

– Lead the design and development of navigation systems for wheeled robots;

– Implemented multiple navigation-related algorithms, including: reinforcement-learning-based collision avoidance, Lidar-based SLAM algorithms, MPC-based control algorithms.

Engineer Jul 2016 - Dec 2018

CleverSys Inc, Reston VA

– Design and develop equipment for animal behavior analysis research, including hardware and software design for customized solutions;

– Collaborate with research teams to meet experimental requirements and ensure systems are reliable and efficient for data collection and analysis.