YIXI CAI

Curriculum Vitae

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Education

University of Hong Kong — **Hong Kong SAR, China**
Ph.D., Robotics — *Sept, 2020 – Aug, 2024*
Supervisor: Dr. Fu Zhang and Prof. James Lam

Beihang University — **Beijing, China**
B.Eng, Automation — *Sept, 2016 – July, 2020*

Publications

First Authored & Co-first Authored

[TRO'2023] **Yixi Cai**, Fanze Kong, Yunfan Ren, Fangcheng Zhu, Jiarong Lin, and Fu Zhang. Occupancy grid mapping without ray-casting for high-resolution lidar sensors. ***IEEE Transactions on Robotics***, volume 40, pages 172–192, 2024. [Paper].

[TRO'2022] Wei Xu*, **Yixi Cai***, Dongjiao He, Jiarong Lin, and Fu Zhang. Fast-lio2: Fast direct lidar-inertial odometry. ***IEEE Transactions on Robotics***, volume 38, pages 2053–2073. IEEE, 2022. [Paper].

Featured

[IJRR'2023] Guozheng Lu, **Yixi Cai**, Nan Chen, Fanze Kong, Yunfan Ren, and Fu Zhang. Trajectory generation and tracking control for aggressive tail-sitter flights. ***The International Journal of Robotics Research***, volume 43. SAGE Publications Sage UK: London, England, 2023. [Paper].

[TRO'2023] Jiarong Lin, Chongjian Yuan, **Yixi Cai**, Haotian Li, Yunfan Ren, Yuying Zou, Xiaoping Hong, and Fu Zhang. Immesh: An immediate lidar localization and meshing framework. ***IEEE Transactions on Robotics***, volume 39, pages 4312–4331, 2023. [Paper].

[SR'2023] Nan Chen, Fanze Kong, Wei Xu, **Yixi Cai**, Haotian Li, Dongjiao He, Youming Qin, and Fu Zhang. A self-rotating, single-actuated uav with extended sensor field of view for autonomous navigation. ***Science Robotics***, volume 8, page eade4538. American Association for the Advancement of Science, 2023. [Paper].

[TMECH'2022] Youming Qin, Nan Chen, **Yixi Cai**, Wei Xu, and Fu Zhang. Gemini ii: Design, modeling, and control of a compact yet efficient servoless bi-copter. ***IEEE/ASME Transactions on Mechatronics***, volume 27, pages 4304–4315. IEEE, 2022. [Paper].

Others

[TRO'2024] Fangcheng Zhu, Yunfan Ren, Longji Yin, Fanze Kong, Qingbo Liu, Ruize Xue, Wenyi Liu, **Yixi Cai**, Guozheng Lu, Haotian Li, et al. Swarm-lio2: Decentralized, efficient lidar-inertial odometry for uav swarms. ***IEEE Transactions on Robotics***, 2024. [Preprint].

[RAL'2024] Hairuo Wei, Rundong Li, **Yixi Cai**, Chongjian Yuan, Yunfan Ren, Zuhao Zou, Huajie Wu, Chunran Zheng, Shunbo Zhou, Kaiwen Xue, and Fu Zhang. Large-scale multi-session point-cloud map merging. ***IEEE Robotics and Automation Letters***, pages 1–8, 2024. [Paper].

[IROS'2024] Yunfan Ren, **Yixi Cai**, Fangcheng Zhu, Siqi Liang, and Fu Zhang. Rog-map: An efficient robocentric occupancy grid map for large-scene and high-resolution lidar-based motion planning. ***International Conference on Intelligent Robots and Systems(IROS)***, 2024. [Preprint].

[IJRR'2024] Haotian Li, Yuying Zou, Nan Chen, Jiarong Lin, Xiyuan Liu, Wei Xu, Chunran Zheng, Rundong Li, Dongjiao He, Fanze Kong, **Yixi Cai**, et al. Mars-lvig dataset: A multi-sensor aerial robots slam dataset for lidar-visual-inertial-gnss fusion. ***The International Journal of Robotics Research***. SAGE Publications Sage UK: London, England, 2024. [Paper].

[CASE'2023] Yuying Zou, Haotian Li, Yunfan Ren, Wei Xu, Yihang Li, **Yixi Cai**, Shenji Zhou, and Fu Zhang. Perch a quadrotor on planes by the ceiling effect. In *2023 IEEE 19th International Conference on Automation Science and Engineering (CASE)*, pages 1–7. IEEE, 2023. [Paper].

[RAL'2023] Fanze Kong, Xiyuan Liu, Benxu Tang, Jiarong Lin, Yunfan Ren, **Yixi Cai**, Fangcheng Zhu, Nan Chen, and Fu Zhang. Marsim: A light-weight point-realistic simulator for lidar-based uavs. ***IEEE Robotics and Automation Letters***, volume 8, pages 2954–2961. IEEE, 2023. [Paper].

[TCST'2022] Wei Xu, Dongjiao He, **Yixi Cai**, and Fu Zhang. Robots' state estimation and observability analysis based on statistical motion models. ***IEEE Transactions on Control Systems Technology***, volume 30, pages 2030–2045. IEEE, 2022. [Paper].

[RAL'2021] Fanze Kong, Wei Xu, **Yixi Cai**, and Fu Zhang. Avoiding dynamic small obstacles with onboard sensing and computation on aerial robots. ***IEEE Robotics and Automation Letters***, volume 6, pages 7869–7876. IEEE, 2021. [Paper].

Fellowships & Awards

RSS Pioneer in Robotics: Science and Systems 2024

Best Paper Award Finalist in IEEE/ASME Transactions on Mechatronics, 2023

Y S and Christabel Lung Postgraduate Scholarship for Engineering Students 2020-2021.

University Postgraduate Fellowships for the academic year 2020-21.

Postgraduate Scholarships, as a Ph.D. research scholar at University of Hong Kong.

Scholarly Reviews

Transactions on Robotics

Journal of Field Robotics

Transactions on Mechatronics

Robotics and Automation Letters

Transactions on Intelligent Vehicles

Transactions on Aerospace and Electronic Systems

International Conference on Robotics and Automation (ICRA) 2024

International Conference on Intelligent Robots and System (IROS) 2022-2024

Teaching Assistantship

MECH3433 Robotics, drones and autonomous ground vehicles — **Spring Semester** *2020-2024*