

LiDAR-Inertial Odometry State Correction in Degeneracy Environment

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Abstract—The characteristics of the Hilti dataset are many aggressive motions and degeneracy environments for state estimation with LiDAR sensors. To solve this problem, we implemented wrong state correction method in degeneracy environments. We integrate this method into FAST-LIO2. We utilized pose graph optimization with coarse to fine method using Quatro which is global registration and GICP.

I. METHODS

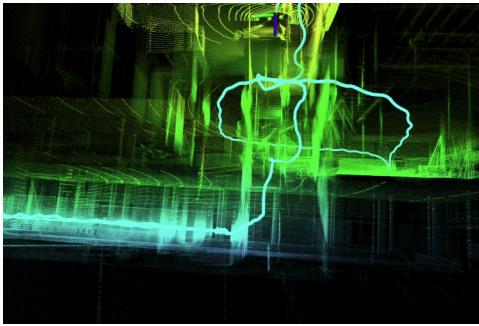


Fig. 1. Before correction

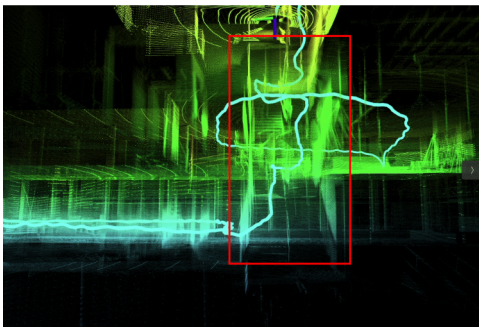


Fig. 2. After correction

REFERENCES

- [1] Xu, Wei, et al. "Fast-lio2: Fast direct lidar-inertial odometry." IEEE Transactions on Robotics 38.4 (2022): 2053-2073.
- [2] Lim, Hyungtae, et al. "A single correspondence is enough: Robust global registration to avoid degeneracy in urban environments." 2022 International Conference on Robotics and Automation (ICRA). IEEE, 2022.
- [3] K. Koide, M. Yokozuka, S. Oishi, and A. Banno, "Voxelized GICP for fast and accurate 3D point cloud registration," EasyChair Preprint, no. 2703, 2020.

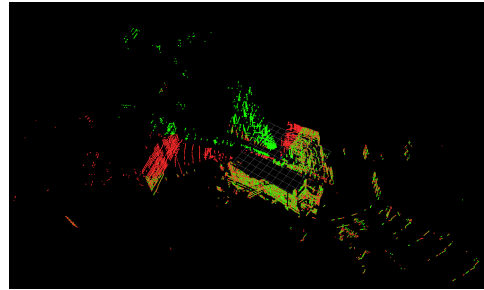


Fig. 3. Quatro

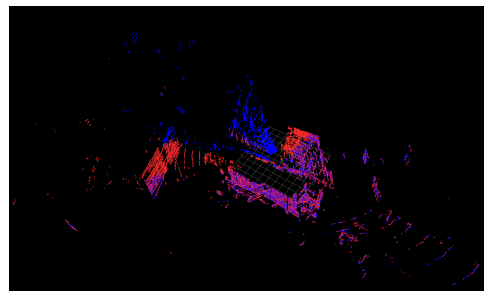


Fig. 4. GICP

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