

Map Matching Performance under Various Similarity Metrics for Heterogeneous Robot Teams

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Abstract : Aerial and ground robots have various advantages of usage in different missions. Aerial robots can move quickly and get a different sight of view of the area, but those vehicles cannot carry heavy payloads. On the other hand, unmanned ground vehicles (UGVs) are slow moving vehicles, since those can carry heavier payloads than unmanned aerial vehicles (UAVs). In this context, we investigate the performances of various Similarity Metrics to provide a common map for Heterogeneous Robot Team (HRT) in complex environments. Within the usage of Lidar Odometry and Octree Mapping technique, the local 3D maps of the environment are gathered. In order to obtain a common map for HRT, informative theoretic similarity metrics are exploited. All types of these similarity metrics gave adequate as allowable simulation time and accurate results that can be used in different types of applications. For the heterogeneous multi robot team, those methods can be used to match different types of maps.

Keywords : common maps, heterogeneous robot team, map matching, informative theoretic similarity metrics

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