LiDAR Based Real Time Multiple Vehicle Detection and Tracking

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Abstract : Self-driving vehicle require a high level of situational awareness in order to maneuver safely when driving in real world condition. This paper presents a LiDAR based real time perception system that is able to process sensor raw data for multiple target detection and tracking in dynamic environment. The proposed algorithm is nonparametric and deterministic that is no assumptions and priori knowledge are needed from the input data and no initializations are required. Additionally, the proposed method is working on the three-dimensional data directly generated by LiDAR while not scarifying the rich information contained in the domain of 3D. Moreover, a fast and efficient for real time clustering algorithm is applied based on a radially bounded nearest neighbor (RBNN). Hungarian algorithm procedure and adaptive Kalman filtering are used for data association and tracking algorithm. The proposed algorithm is able to run in real time with average run time of 70ms per frame.

Keywords : lidar, segmentation, clustering, tracking
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