Point Cloud Change Detection With Stereo V-SLAM: Dataset, Metrics and Baseline

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Localization and navigation are basic robotic tasks requiring an accurate and up-to-date map to finish these tasks, with crowdsourced data to detect map changes posing an appealing solution. Collecting and processing crowdsourced data requires low-cost sensors and algorithms, but existing methods rely on expensive sensors or computationally expensive algorithms. Additionally, there is no existing dataset to evaluate point cloud change detection. Thus, this paper proposes a novel framework using low-cost sensors like stereo cameras and IMU to detect changes in a point cloud map. Moreover, we create a dataset and the corresponding metrics to evaluate point cloud change detection with the help of the high-fidelity simulator Unreal Engine 4. Experiments show that our visual-based framework can effectively detect the changes in our dataset.

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