

Constrained RGBD SLAM with a Prior Knowledge of the Environment

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Abstract : In this paper, we handle the problem of real time localization and mapping in indoor environment assisted by a partial prior 3D model, using an RGBD sensor. The proposed solution relies on a feature-based RGBD SLAM algorithm to localize the camera and update the 3D map of the scene. To improve the accuracy and the robustness of the localization, we propose to combine in a local bundle adjustment process, geometric information provided by a prior coarse 3D model of the scene (e.g. generated from the 2D floor plan of the building) along with RGBD data from a Kinect camera. The proposed approach is evaluated on a public benchmark dataset as well as on real scene acquired by a Kinect sensor.

Keywords : SLAM, global localization, 3D sensor, bundle adjustment, 3D model

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