REFINED NON-RIGID REGISTRATION OF A PANORAMIC IMAGE SEQUENCE TO A LIDAR POINT CLOUD

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ABSTRACT:

The combination of LiDAR data with panoramic images could be of great benefit to many geo-related applications and processes such as measuring and map making. Although it is possible to record both LiDAR points and panoramic images at the same time, there are economic and practical advantages to separating the acquisition of both types of data. However, when LiDAR and image data is recorded separately, poor GPS reception in many urban areas will make registration between the data sets necessary. In this paper, we describe a method to register a sequence of panoramic images to a LiDAR point cloud using a non-rigid version of ICP that incorporates a bundle adjustment framework. The registration is then refined by integrating image-to-reflectance data SIFT correspondences into the bundle adjustment. We demonstrate the validity of this registration method by a comparison against ground truth data.

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