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AUTOMATIC PROCEDURE FOR THE REGISTRATION OF THERMOGRAPHIC IMAGES WITH POINT CLOUDS

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Abstract. This paper presents a procedure for the automatic registration of thermographies with laser scanning point clouds. Given the heterogeneous nature of the two modalities, we propose a feature-based approach, satisfying the requisite that extracted features have to be invariant not only to rotation, translation and scale but also to changes in illumination and dimensionality. As speed and minimum operator interaction are prerequisites for the viability of the process in the building industry, our automatic registration procedure includes automatic feature extraction with no human intervention. With this aim, a line segment detector is used to extract 2D lines from thermographies, and 3D lines are extracted through segmentation of the point cloud. Feature-matching and the relative pose between thermographies and point cloud are obtained from an iterative procedure applied to detect and reject outliers; this includes rotation matrix and translation vector calculation and the application of the RANSAC algorithm to find a consistent set of matches. An automatically textured thermographic 3D model is the expected result of these procedures once the point cloud is filtered and triangulated.

[Conference Paper](#) (PDF, 660 KB)

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