

A multi-view dense matching method for planar prior optimization considering scene structure information

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Key words: Education; Photogrammetry; multi-view stereo; Oblique Images; scene structure

SUMMARY

To address the issues of low accuracy in dense matching for weak-textured regions and redundant dense point clouds, this paper proposes a multi-view dense matching method with plane prior optimization that considers both scene texture features and structural features. The method includes the following steps: scene texture feature extraction; scene structural feature extraction; plane prior optimization for multi-view dense matching incorporating texture and structural features; multi-feature constrained depth information chunk fusion to generate the final dense point cloud. This invention not only improves the quality of dense point clouds in weak-textured regions but also enables large-scale scene reconstruction by leveraging scene segmentation, reducing computational resources and accelerating the dense reconstruction process. By utilizing scene structure to maintain reliable sparse point cloud initialization depth information, the method employs plane prior optimization based on scene texture and structural features to assist in accurately calculating depth information for weak-textured regions. Additionally, it performs depth map fusion through multi-feature constrained fusion algorithms, enhancing the fusion quality of dense point clouds to achieve more precise and reliable results.

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FIG Congress 2026
The Future We Want - The SDGs and Beyond
Cape Town, South Africa, 24–29 May 2026