

# Application of DEM Reconstruction From Multi-view Images To A Canopy Area Of Aerial Photogrammetry

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**Abstract:** In aerial photogrammetry, a shooting area is occasionally covered by vegetation. The shade and shelter of trees prevent us from obtaining spatial information obscured by the canopy. The texture and color of the vegetation can be so homogenous that extracting the feature points is prone to failure. This problem makes it difficult to generate a DEM using aerial photogrammetry. Our study attempted to determine a method for improving the accuracy of 3D information obtained from under a canopy. We used photos that shoot under the canopy by using a digital camera, and combined scale-invariant feature transform (SIFT) and structure from motion (SfM) algorithms to conduct multi-view images modeling through the reconstruction of spatial geometry to produce a 3D point cloud. Data fusion was conducted to generate an entire DEM by integrating point clouds into a DEM map by using aerial photogrammetry. We assessed the accuracy of the entire DEM to extract feature points as the control points in a data fusion of the point clouds and the DEM produced by aerial photogrammetry.

Keywords: Aerial photogrammetry, Canopy, Scale-invariant feature transform, Structure from motion, Data fusion