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## AUTOMATIC EXTRACTION OF BUILDING ROOFS FROM PICTOMETRY'S ORTHOGONAL AND OBLIQUE IMAGES

Y. Wang  
Pictometry International Corp., Suite A, 100 Town Centre Dr., Rochester, NY14623, the United States

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**Abstract.** Automatic extraction of buildings from digital images aims at detection of buildings from digital images and reconstruction of roof structure automatically. At Pictometry, more than 30 million images are captured every year and how to extract the useful information of objects on the ground from the existing image library for various applications is a big challenge we face now. In this paper, an automatic approach for extraction of building roof from digital orthogonal and oblique imagery is proposed. The proposed method uses image processing technique to derive the accurate 3D structure of building roof for accurate roof measurement, 3D modeling, computation of building footprints, etc. It consists of three major steps, i.e. extraction of roof corner and ridge points from the images, automatic matching of roof corner and ridge points between orthogonal and oblique images and grouping of the matched roof points to create roof facets.

In this study, the modified Moravec operator is used to extract feature points from digital images. To find roof points which cannot be extracted by the point extractor, edge information is also extracted. Due to the nature of roof points, especially corner points and the difference between orthogonal and oblique images, a feature-based image matching technique is used to derive 3D information of roof corner and ridge points, instead of area-based matching. To match roof points correctly, edges associated with a corner or ridge point and their properties are used. After 3D roof points are generated, roof points belonging to the same roof facet are grouped together by using their spatial relations. Once points belonging to the same facet are found, a surface is fitted to the points and outliers can be removed during this process.

[Conference Paper](#) (PDF, 1350 KB)

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