

Automated Extraction of Control Points for High Spatial Resolution Satellite Images

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Abstract

As IKONOS satellite with 1-m resolution has been launched in 1999, mapping using space-borne images will be a hot issue in computer vision area and photogrammetry. It is obvious that one of the great challenges to process the high spatial resolution satellite images will be the geometric correction practice. Conventionally, the positioning of the image control points is manually performed by a labor-intensive and time-consuming procedure. Furthermore, due to the abundant image contents, high spatial resolution satellite image would have plenty of the qualified control points. As a result, the manual identification and positioning of control points will become even more inefficient and unbearable. Therefore, the main objective of this study proposes to develop an automated image processing technique to extract the control points for the high spatial resolution satellite images. Among numerous spatial features, this study considers even widespread road intersection the main target to perform the control point extraction. The proposed method consists of two parts. The first part is “road extraction” consisting of four steps image-processing algorithm and the second part is “road intersection searching” consisting of two steps image-processing algorithm. A series of high spatial resolution satellite images are used to test the proposed method. The results show that the proposed image processing approach has the potential to automatically position the control points in the high spatial resolution satellite image.

KEY WORDS: High Resolution Satellite Image, Road Intersection, Control Points