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LINE-BASED REGISTRATION OF DSM AND HYPERSPECTRAL IMAGES

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Abstract. Data fusion techniques require a good registration of all the used datasets. In remote sensing, images are usually geo-referenced using the GPS and IMU data. However, if more precise registration is required, image processing techniques can be employed. We propose a method for multi-modal image coregistration between hyperspectral images (HSI) and digital surface models (DSM). The method is divided in three parts: object and line detection of the same object in HSI and DSM, line matching and determination of transformation parameters. Homogeneous coordinates are used to implement matching and adjustment of transformation parameters. The common object in HSI and DSM are building boundaries. They have apparent change in height and material, that can be detected in DSM and HSI, respectively. Thus, before the matching and transformation parameter computation, building outlines are detected and adjusted in HSI and DSM. We test the method on a HSI and two DSM, using extracted building outbounds and for comparison also extracted lines with a line detector. The results show that estimated building boundaries provide more line assignments, than using line detector.

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