**Suggested topics: Data Processing**

**Paper title: A Robust Matching Method for Remote Sensing Images of Different Viewpoint Angles Based on Regional Coherency**

**Author name: Zhenfeng Shao**

**Proposed presenter (s): Zhenfeng Shao**

**Mailing address: shaozhenfeng@whu.edu.cn**

**Phone: +862715827188114**

**fax:+862768778229**

**presenters Preference: oral presentation**

**A Robust Matching Method for Remote Sensing Images of Different Viewpoint Angles Based on Regional Coherency**

Zhenfeng Shao

State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing

Wuhan University, No. 129 Luoyu Road, Wuhan, Hubei, China

shaozhenfeng@whu.edu.cn

**Key words**: image matching; regional coherency; affine invariant; feature detection; feature description

**Abstract:** One of the main challenges faced by high-resolution remote sensing image matching is how to deal with geometric deformation between images, especially for the different viewpoint images. In this paper a robust matching method for remote sensing images of different viewpoint angles based on regional coherency is proposed. Based on the geometric transform analysis, it can be drawn that for the same real scene, if the instantaneous field of view or the target depth changes are small, transformation between pixels in the whole image can be approximated by an affine transform. Otherwise, transformation between different pixel pairs is different, so they can't be expressed by an uniform affine transform. On the basis of this analysis, a region coherency remote sensing image matching method is proposed. In the proposed method, the simplified mapping from image view change to scale change and rotation has been derived. Through this processing, the matching problem between view change images can be converted into the matching between rotation and scale changed images. In the method, local image regions are detected and view changes between these local regions are mapped to rotation and scale change by performing local region simulation firstly. Then, point feature detection and matching are implemented in the simulated image regions. And finally, a group of high-resolution satellite images, aerial remote sensing images and unmanned aerial vehicle images are adopted to verify the performance of proposed matching method respectively, and a comparative analysis with other methods demonstrates the effectiveness of the proposed method, which has proved that the proposed method can obtain good matching results while ensuring high efficiency.