FORMAL ONTOLOGIES FOR EXTRACTING INFORMATION FROM HIGH RESOLUTION SATELLITE IMAGERY

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In the last years, significant research efforts have been dedicated to developing efficient methods for extracting information from high resolution satellite imagery. Object-based image analysis (OBIA) method has received particular attention (Blaschke, 2010). This method starts with the partition of satellite imagery into homogeneous image objects through segmentation (Baatz and Schäpe, 2000). These image objects serve as analysis units in the subsequent classification task (Baatz and Schäpe, 2000). The experts can thereby use their domain and remote sensing knowledge to allocate image objects to the target classes. The expert knowledge is however not organized into consistent and re-usable knowledge bases (Arvor et al., 2013). Therefore, OBIA remains a highly subjective image analysis method (Arvor et al., 2013; Belgiu et al., 2014).

In this work, we describe an image classification framework that combines data-driven segmentation methods with formal ontologies (knowledge bases). Ontologies account for the semantics of target classes and their representation in high resolution satellite imagery. The propose classification framework provides promising solutions to increase the objectivity and transparency of the OBIA method. A case study is presented for classifying land cover classes from WorldView-2 image.

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