

# URBAN IMPERVIOUS SURFACE EXTRACTION FROM VERY HIGH RESOLUTION IMAGERY BY ONE-CLASS SUPPORT VECTOR MACHINE

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**KEY WORDS:** Impervious surface, Multi-level segmentation, One-Class SVM, Very high resolution imagery, Land cover classification

## ABSTRACT:

Impervious surface is an important indicator for urban environmental assessment. The increasing availability of very high resolution (VHR) imagery, such as IKONOS, Quickbird and GeoEye-1, provides great opportunity for detailed impervious surface mapping in urban areas. Although some methods have been developed, obtaining highly accurate land cover and impervious surface information from VHR imagery remains challenging, thus new methods and techniques are still required. This paper proposes a new method for extracting impervious surface from VHR imagery. Since the impervious surface is the only class of interest (i.e. target class), the One Class Support Vector Machine (OCSVM), a recently developed statistical learning method, was used as the classifier. Rather than use samples from all classes for training in traditional multi-class classification, the method only requires samples of the target class for training. The classification was conducted on object level. The proposed method was evaluated and compared to existing methods using Quickbird image from Beijing urban area. The results showed that the proposed method outperformed the existing method in term of classification accuracy. The method provides an effective way to extract impervious surface from VHR images.

**TOPIC:** Land cover classification

**ALTERNATIVE TOPIC:** Image processing and pattern recognition