

A novel spectral index for automatic shadow detection in urban mapping based on WorldView-2 satellite imagery

Abstract

In remote sensing, shadow causes problems in many applications such as change detection and classification. It is caused by objects which are elevated, thus can directly affect the accuracy of information. For these reasons, it is very important to detect shadows particularly in urban high spatial resolution imagery which created a significant problem. This paper focuses on automatic shadow detection based on a new spectral index for multispectral imagery known as Shadow Detection Index (SDI). The new spectral index was tested on different areas of WorldView-2 images and the results demonstrated that the new spectral index has a massive potential to extract shadows with accuracy of 94% effectively and automatically. Furthermore, the new shadow detection index improved road extraction from 82% to 93%.

Keyword: Spectral index; Shadow detection; Remote sensing images; WorldView-2