Paper ID: 47681
student

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

Author: Ms. Juli Zhang
Xi'an Microelectronics Technology Institute, CASC, China, juli2320@sina.com

Mr. He Zhanzhuang
Xi'an Microelectronics Technology Institute, CASC, China, hzz771@163.com
Dr. Xiangzeng Liu
Xi'an Microelectronics Technology Institute, CASC, China, lxzccy20062008@126.com
Prof. Xuehan Tang
Xi'an Microelectronics Technology Institute, China Academy of Space Electronics Technology (CASET), China Aerospace Science and Technology Corporation (CASC), China, m13772060157@163.com

AN EFFICIENT AUTOMATIC CLOUD DETECTION FOR REMOTE SENSING IMAGES USING BINARIZED NEURAL NETWORKS

Abstract

Cloud cover plays a very important role in meteorological research and other remote sensing applications. With the rapid development of the satellite technologies, more and more valuable remote sensing data have been studied to analyze the global climate changing problems, land cover and forest cover, and global population problems, etc. However, data with cloud cover usually has a vital effect on the remote sensing data transmission efficiency and needs more memory for storage. Even more, it is useless when the cloud cover area in a satellite image is too large. Consequently, cloud detection has become an increasing concerned issue in extracting information from remote sensing images, which are used in geophysical, geomorphological, and meteorological, etc. In this paper, we focus on the remote sensing data transmission efficiency and memory cost problems. To address this problem, an efficient automatic cloud detection algorithm is proposed, which uses a novel binarized convolution neural networks to detect the cloud in remote sensing images to improve the detection accuracy and the speed, and then remove the image if the cloud cover area is too large to reduce the image storage space. This novel binarized convolutional neural networks is small in model size, high accuracy in detecting, and less memory size in processing, which can be easily deployed in satellite on-board information systems and other spacecraft or embedding devices. We compare our method with current mainly cloud detection approaches, the comparisons of experimental results show the advantages of this algorithm on cloud detection for remote sensing images.

Key Words: Remote Sensing, Cloud Detection, Binarized Neural Networks