Paper ID: 22633
oral

EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Data Management Systems (4)

Author: Prof. Krištof Oštir
SPACE-SI, Slovenia

Mr. Aleš Marsetič
Slovenia
Mr. Peter Pehani
SPACE-SI, Slovenia
Dr. Tatjana Veljanovski
Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Slovenia
Dr. Janez Zaletelj
SPACE-SI, Slovenia
Dr. Tomaž Rodič
SPACE-SI, Slovenia

AUTOMATIC NEAR-REAL-TIME SATELLITE IMAGE PROCESSING CHAIN

Abstract

The Slovenian Centre of Excellence for Space Sciences and Technologies (Space-SI) has developed and implemented a fully automatic image processing chain that performs all processing steps from sensor-corrected (Level 1) optical satellite images to web-delivered map-ready products. It is a near-real-time processing workflow that operates fully automatic with no operator's intervention required. Processing chain was developed and fully tested on RapidEye images. Support to WorldView-2 and THEOS sensors is in the final testing phase and we are extending the list of supported sensors also to Landsat 8, SPOT 6, QuickBird and Pleiades.

The processing chain performs several steps, starting with automatic geometric and radiometric pre-processing, followed by a variety of automatic interpretations and analyses. Module for automatic image orthorectification is based on a physical sensor model. Module for radiometric correction combines atmospheric corrections and topographic corrections implemented on the basis of anisotropic illumination model. Low level products generation modules include NDVI, Change of NDVI and simple Change detection.

There are several output results emerging from a single input image, which are stored in the database, along with metadata about the processing strategy and parameters. The final results of the processing chain are services delivering data to end-users. All processing step are divided into smaller sub-steps, each one prepared as an independent IDL or C++ module and controlled from within the Java control module. The Java/IDL bridge is used to run the individual modules using XML-encoded metadata. Furthermore, the control module communicates also with the Java-based web application and stores/retrieves data to/from the database.