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ASIS – AUTOMATED SPECTRAL INTERPRETATION SYSTEM

Abstract

Processing of spectral imagery from space requires several calibration procedures, an application-wise interpretation process for information extraction, geometric correction of the resulting map and production to a geographical information system (GIS). Most of this processing chain is done manually by value adding companies and requires expert knowledge. Specific requirements also arise for specific sensors, especially in terms of the calibration process.

ASIS is designed to serve as a generic spectral image processing and interpretation station for spectral EO missions that IAI will launch within the next three years: VENμS (A cooperation of the French and Israeli space agencies, CNES ISA for a research mission) with 12 spectral bands in the 400-950nm range, and SHALOM (A cooperation of the Italian and Israeli space agencies, ASI ISA for a commercial mission) with 210 effective spectral bands in the 400-2500nm. The system processes images that contain at least four spectral bands having wavelengths in the solar reflective range of 400-2500nm. ASIS is able to support multiple spectral sensors (multi-spectral and hyper-spectral). The system performs pre-processing (various calibrations), processing (interpretation) and post-processing (final product formatting and logging) actions automatically upon the input images and data layers, according to algorithms chosen by the user via a graphical user interface.

Applications met by ASIS cover a variety of economic sectors including Precision Agriculture Forestry, Illicit crop detection, Energy Mineral exploration, Water quality fishery, Coastal management, Environment monitoring pollution, Urban growth, Spectral change detection and Disaster management.

ASIS is flexible and extensible, and as such supports the addition of new spectral sensors and new algorithms by users, via a simple graphic interface. ASIS architecture is also flexible, and designed using a modular data access layer to algorithms and sensors, being replaceable easily if required.

Research and Development of ASIS is carried out in MBT-Space, at the MTH Division of IAI. The first version of ASIS is to be released within Q1-Q2 of 2015. Further development is planned throughout 2015 towards version 2 with additional features added.