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Tools and Technology in Support of Integrated Applications (1)

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ASIF – AUTOMATED SYSTEM FOR IMAGE FUSION

Abstract

Today remote sensing involves various types of sensors that scan earth's surface and produce images containing diverse types of information. Each sensor provides unique data that is transformed to information from scene. We are presenting here a software tool called ASIF (Automated System for Image Fusion) which automatically combines each sensor's data into one synergistic combination of imagery (a fused image). With ASIF the user can quickly generate a single image containing the fused data instead of investigating several images, providing a new way of observing convenient information at a region of interest. ASIF, as an integrating tool of EO (Electro-Optical) and SAR (Synthetic Aperture Radar) images provides fused information from the images. It performs optimal pre processing algorithms for overcoming the difficulties in combining different contexts. Every optimized process was evolved after an extensive research on a diverse group of EO-SAR datasets. The fusion optimization is oriented for visual interpretation based on: surface, objects and infrastructures. ASIF involves state of the art image and signal processing steps that estimate the required processing of inputs in an adaptive manner, oriented for optimal results for visual human perception and analysis. These handle automatically all required geometric and radiometric pre-processing stages.

The fusion modes are determined by the input EO-SAR images that are available over the requested region of interest. Input data may be: panchromatic EO, RGB only EO, multi-spectral EO, multi-polarized SAR, multi-frequency and multi-temporal SAR data. At each resulting fusion product we reveal the latent added value of its member input images, in order to get resolution improvement, data certainty, objects detection and identification, change detection, completion of details and so on.

ASIF system allows a new interesting interpretation product that resolves open questions that rise from the surface and provides us a comprehensive view of it. It provides us opportunities that better exploit the use of the sensors' data beyond the conventional and straightforward understanding.