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SMART TERMINAL FOR DEEP IMAGE ANALYTICS

Abstract

Why more added value on ground image systems ?

The image processing chains of our ground segments are traditionally oriented towards the acquisition, production, archiving and delivery of image products. However, images are not always the useful or relevant information for the end user. At the same time images volume continues to increase and constitutes one of the major obstacle to the simplification of the infrastructure and the drastic costs reduction of our systems. To highlight this problematic, the size of an uncompressed 14 km x 14 km PNEO scene processed in PanSharp mode is about 10 Gbytes and during its operation a ground segment can process and store hundreds of thousands of this type of product.

Benefits of image analytics support

A relevant solution to both better meet the user final need, reduce the system required hardware and then the associated costs is to increase the value chain produced by our systems by coming closer to the final operational needs. In this case the production of images, and the management of associated volumes, is no longer the purpose of the system but just an intermediate step serving for the analysis and extraction of the useful information. The success and growing progress of AI techniques, such as deep learning, now make it possible to implement value-added applications applied to spatial imagery, even if the volumes of data and processing times are significant challenges.

The "SMART Terminal" main concepts

The goal is to build a new kind of system that performs the automatic analysis of image data acquired through dedicated AI algorithms and generates the corresponding "analytics". In its design the system must be light, multi-domain, easy to use and clearly oriented towards the needs of the end user.

An example of analytics module that can be integrated into the SMART Terminal was implemented in 2022 as part of the "DeepTracker" R&D. This study aimed to define the environment necessary for the activation of various AI algorithms on large PNEO images. DeepTracker execution concept combines the activation of an object detection algorithm with the new Airbus PNEO DeepZoom algorithm used to generate the HD Color thumbnail at 15 cm resolution of each detected target in addition to the geographical location processed for the detections.

This kind of analysis can be used in commercial and military systems for maritime surveillance or overseeing of strategic or sensitive sites.