IAF SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
Tools and Technology in Support of Integrated Applications (1)

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EARTHBIT: A DESKTOP TOOL TO INGEST AND PROCESS PRISMA HYPERSPECTRAL DATA

Abstract

earthbit is a desktop SW application aimed at the quick management and complete visualization of Earth Observation data products with a vertical specialization to the interaction and manipulation of PRISMA hyperspectral mission products. The earthbit development environment was born as a tool able to manipulate very big EO data sources, such as SAR and hyperspectral images, together with image streams in real-time. It allows to create, configure and execute massively parallel processing tasks (specific for satellite imagery or science data) on big datasets by leveraging the power of a proprietary map/reduce framework. Its Human Machine Interface enables the user to interact with algorithms, image data and unstructured metadata easily and exploit the power of heterogeneous computing devices such as modern multi-core CPUs, GPUs and Accelerators (FPGA and ASICs with OpenCL support). In the PRIMA edition, users can have a simple interface enabling a straightforward interaction with data and meta-data composing the HDF-EOS data files. All the spectral bands can be viewed with one click, meta-data can be searched, interpreted, and plotted while the file structure complexity remains transparent. It also adds functions for data interpretation, such as spectral signature visualization of each product from each band, pixel geolocation on WGS84 map on the fly, metadata overview, and visualization of the additional dataset or plotting of vector attributes. It also provides the user with the capability to process data through the Python API, able to act as a bridge between PRISMA data and python standard libraries, allowing the integration of external plug-ins (both python and C++) and the implementation of interactive processing with the real-time display of results. User from an editor can produce Python scripting and generate product processing while also having support to create new Python plug-ins or algorithms. It also supports the construction of processing workflows through the graphical integration and configuration of elementary algorithmic blocks, either already provided by the tool or built by the user. Its plug-in architecture allows new missions and data formats to be quickly integrated, so it can be extended to ingest and process other hyperspectral and multispectral missions. The earthbit SDK provides dynamic linking libraries for different operating systems: Microsoft ® Windows10 (32bit 64bit), Linux RedHat, Ubuntu Linux, CentOS 7, Gentoo Linux, Apple® macOS and running on the following proc. Architectures as Intel/AMD x86 and $x86_64, ARMARMv7 - AandARMv8 - A$.