

EARTHBIT

SMART SATELLITE DATA PROCESSING

EARTHBIT is a powerful SW tool specifically designed for manipulating very big EO data sources, such as SAR and hyperspectral images, as well as image streams in real-time, and configure and execute massively parallel processing tasks on big datasets by leveraging the power of a proprietary map/reduce framework.

Its Human Machine Interface enables the User to easily interact with algorithms, image data and unstructured metadata and exploit the power of heterogeneous computing devices such as modern multi-core CPUs, GPUs and Accelerators (FPGA and ASICs with OpenCL support). Earthbit supports simultaneous visualization of different types of EO images that can be navigated in co-registration mode, providing real-time graphical operation on them. It includes support for optical panchromatic, multispectral and hyperspectral imagery, and SAR data.

SIMPLIFYING COMPLEXITY.

SPACEBIT. FRAMEWORK & SDK.

The framework provides C++ and python APIs enabling:

- Interacting with the operating system
- Reading and writing of image pixels
- Reading and writing of hierarchical metadata
- Accelerating intensive data processing tasks exploiting the available multicore CPU and GPU
- Implement a Map/Reduce scheduler over multicore CPU
- Implement general purpose and EO-specific image processing feature



Credits: ASI



Credits: ASI



BENCHMARKS



Load ~4GiB image from disk to memory in less than 15s



Create image pyramids on the fly, with in-memory caching of tiles



Maximize the use of Solid State Disks



Execute real-time image filtering at about 400fps on GPU

FEATURES

Load images, datasets and attributes from hierarchical data files (HDF5, HDF-EOS, NetCDF, Sentinel-SAFE, TIFF, JPEG)

Visualize and process big datasets

Manage SAR, optical multi & hyper spectral products

Estimate radiometric & geometric performances

Plug custom algorithms for image processing, with earthbit API supporting Python scripting and the C++ development kit. Processing design via an integrated graphical workflow editor.

Execute processing and visualization algorithms on multi CPUs /GPUs, thanks to a proprietary acceleration engine (integrating Khronos OpenGL and OpenCL)



Earthbit with its customized plug-ins is now in use in PRISMA and Cosmo Second Generation operational activities. PRISMA Toolbox implements a comprehensive support for rapid interpretation and visualization of the hyperspectral data acquired from PRISMA and EnMap missions.

PORTABILITY & EXTENSIBILITY

The SDK provides dynamic linking libraries for the following operating systems:

- Microsoft® Windows10 (32bit & 64bit),
- Linux RedHat, Ubuntu Linux, CentOS 7, Gentoo Linux,
- Apple® macOS

and architectures:

- Intel/AMD x86 and x86_64,
- ARM ARMv7-A and ARMv8-A

Developers may add new functions, capabilities and processing algorithms by implementing "engine" and "io-filters" plugins.

