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# Prototype of an Automatic Near Real-Time Satellite Image Processing Chain

Space-SI is developing a complete automatic (no operators's intervention) near real-time processing chain from raw optical satellite image to webdelivered map-ready products. Prototype presented here is an functional subset of the planned full chain. Currently prototype is operational in the area of Slovenia and for the RapidEye imagery.



- R Automatic generation of results
- \* R2.1 NDVI generation module
- S End user services
- \* S2 Web mapping of products
- Supported sensor: RapidEye

## Final implementation (end of 2013)

Refinement and optimisation of prototype modules.

- \* P2.1 Sub-module for atmospheric correction
- \* R1 Change detection sub-module
- \* R2.2 NDVI changes sub-module
- \* S1 Data catalog
- \* S3 End user/administrator triggered re-processing

Support to various full-frame and pushbroom sensors will be added.

### Main control module, database

Main control module is the "brain" of the processing chain, with the following tasks:



R2.1 NDVI (Normalized Difference Vegetation Index) is a standard product in remote sensing of vegetation. To improve visual interpretation of NDVI and to enable easier comparison between two or more NDVI products from two or more different satellite images, we use RGBrendering based on a fixed color scheme.

\* control of available processing resources (e.g. CPU, memory, etc.),

- \* control of correct execution of individual image processing modules,
- \* communication with all other parts of the system (i.e. the web application and database) which were developed in Java environment.
- It is developed in Java. The Java/IDL bridge and input/output XML forms are used to pass/receive the processing commands and parameters to/from the individual modules of image processing chain which are developed in IDL and C++.

Database is implemented on the PostGIS infrastructure.

Figure below: On the operational level the execution of the prototype processing chain is controled by the application window.

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\* radiometrically corrected images \* interpretation results \* metadata about processing



end user / S 2 products delivery

Figure above: Planned full processing chain. The modules are denoted as: **P** - **P**re-processing modules (geometric and radiometric corrections) **R** - modules for automatic interpratation yielding **R**esults **S** - end user **S**ervices Modules implemented in the prototype are marked in darker colour.



Figure left: RGB rendering of NDVI for the area around Maribor for situation in March 2011.



## S2 Service: Web mapping of products



S2 Web mapping of products is one of the possibilities of final product dissemination. All the key products are passed to web mapping application which enables GIS functionalities such as geo-location of processed images and some basic feature querying (e.g. sensor type, available products, date, etc.). Additionally a WMS server was developed to facilitate the use and integration of products into other third-party applications.

Figure left: End user viewer.



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