

BASIC SOFTWARE TOOLS TO REMOTELY MANAGE MASSIVE HYPERSPECTRAL DATA ARRAYS IN DISTRIBUTED INFORMATION INFRASTRUCTURE

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THEME: Data and Information Systems and Spatial Data Infrastructures: Systems to manage, process, store and distribute Earth observation data and products.

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ABSTRACT:

Creating high-performance means to manage massive hyperspectral data (HSD) arrays is an actual challenge when it is implemented to deal with disparate information resources. Aiming to solve this problem the present work develops the tools to work with HSD in a distributed information infrastructure, i.e. primarily in remote users' access mode. The features of presented approach is in the development of remotely accessed services that allow users to conduct the search and retrieval of data sets of hyperspectral observations and to provide users with tools to analyze and to process remotely located data.

The main results of the work is in effective HSD usage based on developing remotely accessed services for

- high-performance algorithms to work with multidimensional HSD arrays in order to solve operational monitoring tasks;
- methods for classifying objects using HSD in order to determine the spectral characteristics of observed objects;
- methods of Earth objects feature extraction from HSD.

Basic software tools implemented these services using HSD dimensionality reduction in remotely accessed mode as well by developing high performance transfer, storage and retrieval procedures to manage massive hyperspectral data arrays by remote users. Software tools are integrated into VEGA-PRO information system (www.pro-vage.ru) and provide VEGA-PRO with additional remotely accessed services including

- map interface which enables remote access to information resources system containing HSD as well means to access data of multispectral satellite observations;
- remote tool interfaces to manage hyperspectral data processing and classification procedures.

In addition the dynamic interfaces built on technology Stream Handler© were implemented in order to provide visualization and monitoring of flexible (and context-interactive) remotely managed HSD processing.

Developed software tools were successfully tested on Hyperion data over thermal anomaly zones.

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