



A High-volume Fusion and Analysis Platform for Geospatial Point Clouds, Coverages and Volumetric Data Sets

www.iqmulus.eu



ABOUT

IQmulus is a new four-year Large-scale Integrating Project with a total budget of 10.1 Million €, of which 8.1 Million € are funded by the EU Seventh Framework Programme in the area Intelligent Information Management, ICT 2011.4.4 of Challenge 4: Technologies for Digital Content and Languages (November 2012 – October 2016)gramme in the area Intelligent Information Management, ICT 2011.4.4 of Challenge 4: Technologies for Digital Content and Languages (November 2012 – October 2016)

GOALS

Develop methods for knowledge-driven processing of topographic data

- High-quality coregistration from multiple heterogeneous data sets;
- Efficient feature extraction and classification methods for detecting keypoints and correlations between different geodatasets (e.g. coverages and point clouds);
- Efficient surface generation, using multi-resolution and level-of-details techniques;
- High-quality change detection methods to characterize dynamic events;
- Descriptive information to be associated to dataset (metadata) explaining the process, or workflow, that produced it, leading to provision of processing and capturing semantics.

Develop methods for the visual analysis and inspection of huge geospatial datasets

- Visualisation and exploration of large heterogeneous nD geodata sets, based on leading-edge GPU technology, with corresponding data preprocessing services;
- Web-based visualization for non-expert decision makers, realized via client-side or server-side rendering, with corresponding pre-processing services.

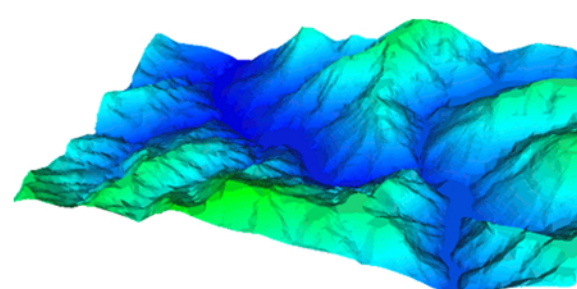
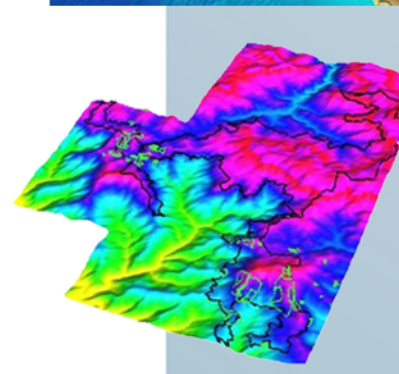
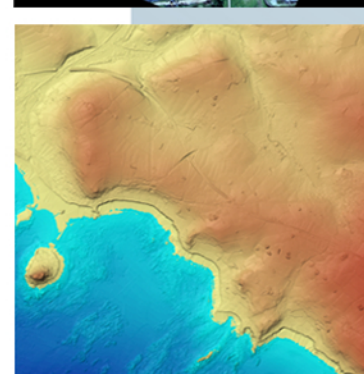
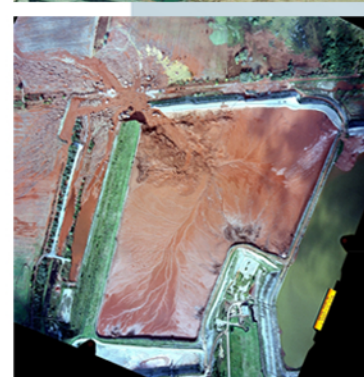
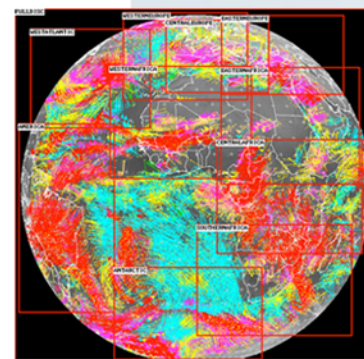
Integration of the services into a platform able to sustain data-intensive processing

- A model for hierarchic, domain-specific languages with which users will be able to specify workflows for processing data sets, independently of underlying execution architectures;
- A spatial data processing middleware that abstracts from different parallel and distributed processing infrastructures, such as GPGPUs, Map/Reduce and Cloud environments, and that can choose the ideal architecture given an algorithm and a data set description.

Will leverage the information hidden in large heterogeneous geospatial data sets and make them a practical choice to support reliable decision making.

CONSORTIUM

SINTEF STIFTELSEN SINTEF, Department of Applied Mathematics, Norway
Fraunhofer Institute for Computer Graphics Research, Germany
CNR-IMATI Institute for Applied Mathematics and Information Technologies of the National Research Council, Italy
M.O.S.S. Computer Grafik Systeme GmbH, Germany
HRW HR Wallingford Ltd, UK
FÖMI Hungarian National Mapping and Cadastral Agency, Institute of Geodesy, Cartography and Remote Sensing, Hungary
UCL University College London, Research centre for Photogrammetry, 3D Imaging and Metrology, UK
TU Delft Delft University of Technology, Department of Earth and Climate Sciences & Man-Machine Interaction Group, The Netherlands
IGN Institut National de l'Information Géographique et Forestière, France
UBO Université de Bretagne Occidentale, European Institute for Marine Studies, France
Ifremer L'Institut Français de Recherche pour l'Exploitation de la Mer, France
Liguria Regione Liguria, Genova, Italy



Valuable information exists in huge geospatial datasets but is hidden and not integrated in the decision process

New emerging data acquisition techniques provide fast and efficient means for multidimensional spatial data collection.

Airborne LIDAR surveys, SAR satellites, stereo-photogrammetry and mobile mapping systems are increasingly used for digital reconstruction. All these systems provide point clouds, often enriched with other sensor data, yielding extremely high volumes of raw data.

Often it is only accessed for damage assessment in a "what went wrong?" analysis

Recent emergencies, such as the toxic industrial mud spill in Ajka, Hungary, in October 2010, and the flooding rain in Genova, Italy, in November 2011, have emphasized the fact that actually a lot of crucial information is indeed contained in existing large geospatial datasets but it is hidden and in no way integrated in on-going decision processes. Valuable knowledge could be extracted from this data but currently the hidden information is typically only accessed in hindsight for damage assessment and knowledge only derived in a belated "what went wrong" analysis.

Make information from large geospatial datasets available on time, with interactive visual decision support, and at the relevant level of decision making

It will be of great importance that the users can specify a desired workflow on a high level and do not have to learn complicated technical jargon. All implementation details will remain unseen for the users who will be heavily involved in the project from the very start in an initial requirement specification phase, and later in the testing of components and in two testing and evaluation cycles of the developed prototypes.

IQmulus will be validated in two test cases of economic and social importance to Europe: Maritime Spatial Planning and Land Applications for Rapid Response and Territorial Management, addressing both expert users (such as for example engineers investigating suitable locations for a wind park) and decision makers (for example in emergency cases that require quick responses), both from within and from outside the project consortium.

