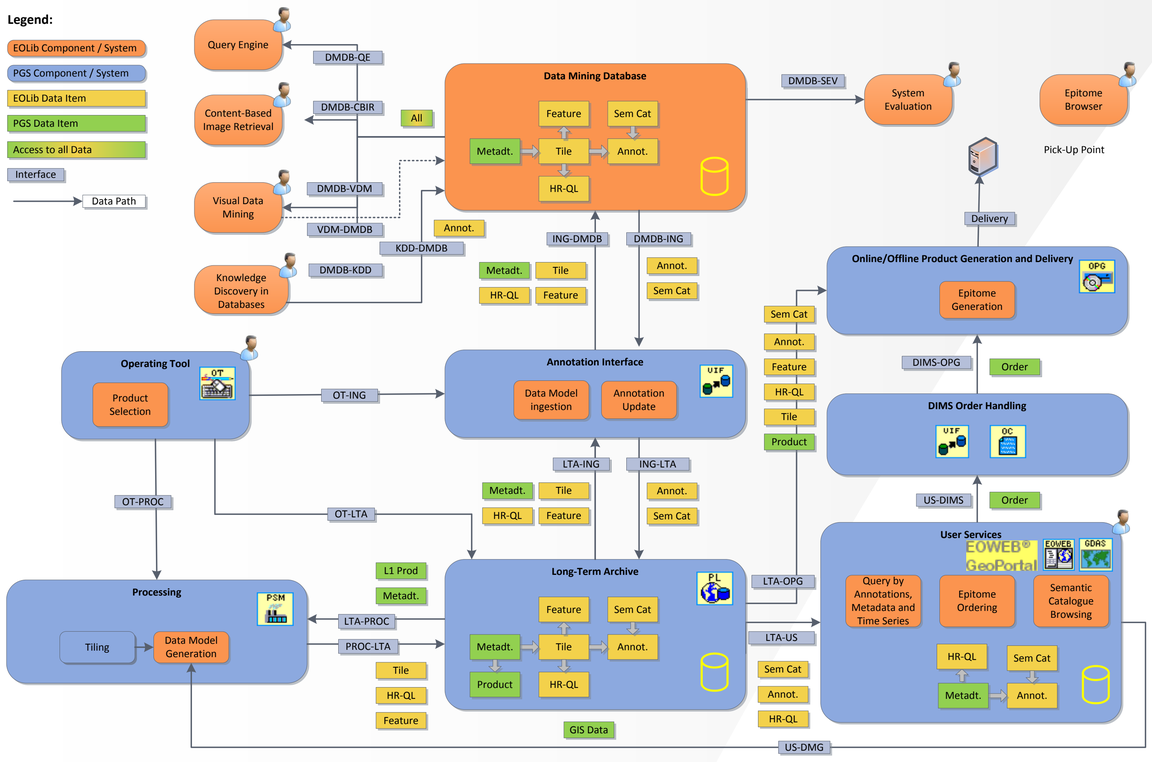
# Automated Urban Mapping in a Satellite Ground Segment

Mihai Datcu, Daniela Espinoza-Molina, Octavian Dumitru, Gottfried Schwarz, Christoph Reck, Vlad Manilici
DLR German Aerospace Center, Münchener Str. 20, D-82234 Weßling, Germany

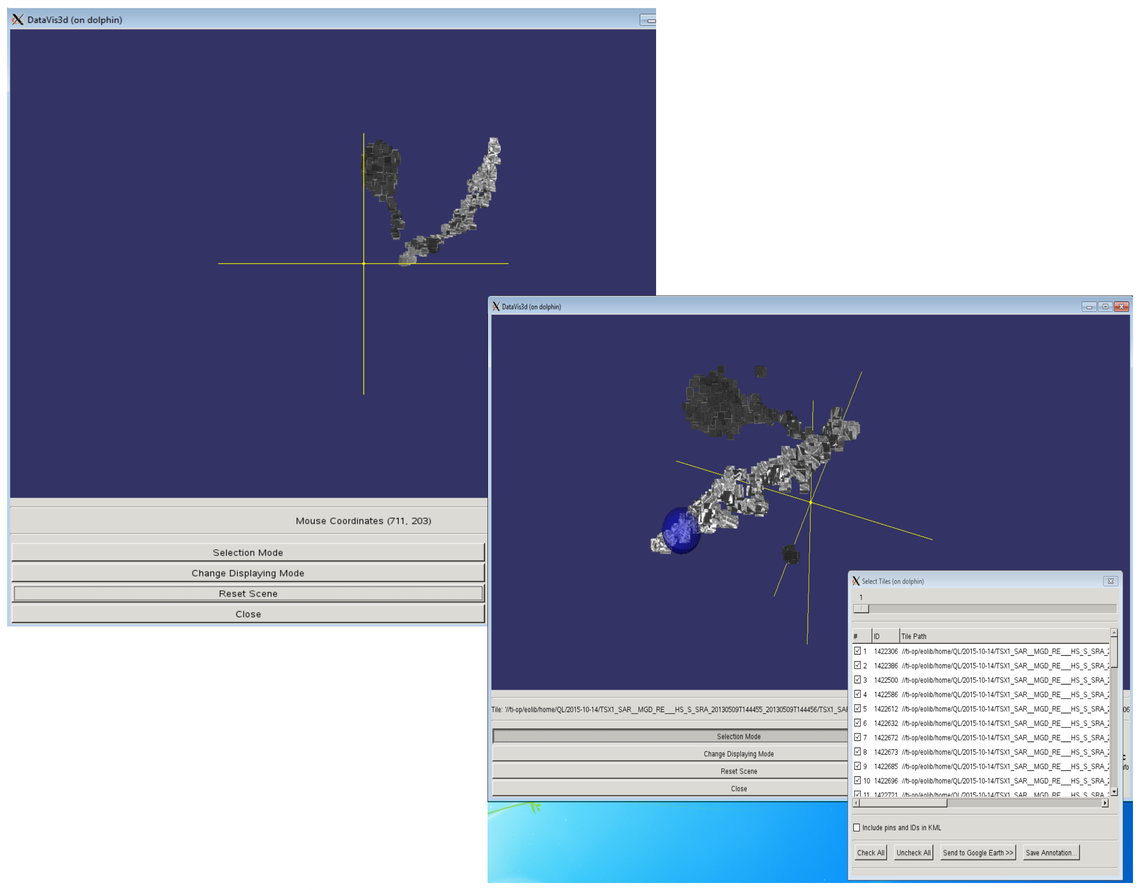
## Abstract

The ESA-funded Earth Observation image Librarian (EOLib) project serves to setup the next-generation of Image Information Mining (IIM) systems, implementing novel techniques for image content exploration. EOLib will exploit information about Earth Observation (EO) product contents which is usually hidden in raster data, image time series and metadata, thus enabling content-based search in very large archives of high resolution EO data.
This system is particularly suitable for (semi-)automated urban mapping as the EO product information content represents actionable information for local information mining, including the semantic annotation of image patches.

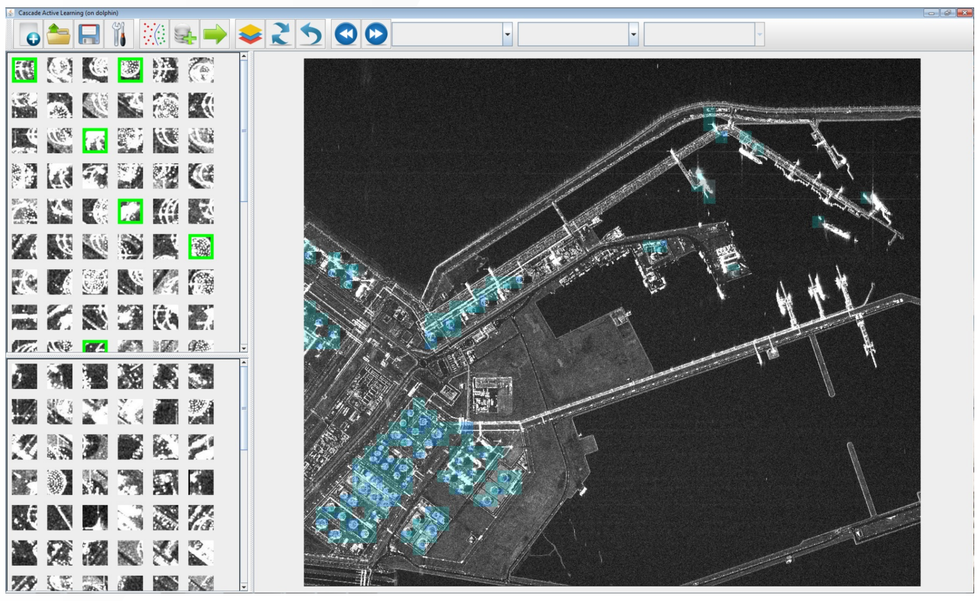
## Architecture

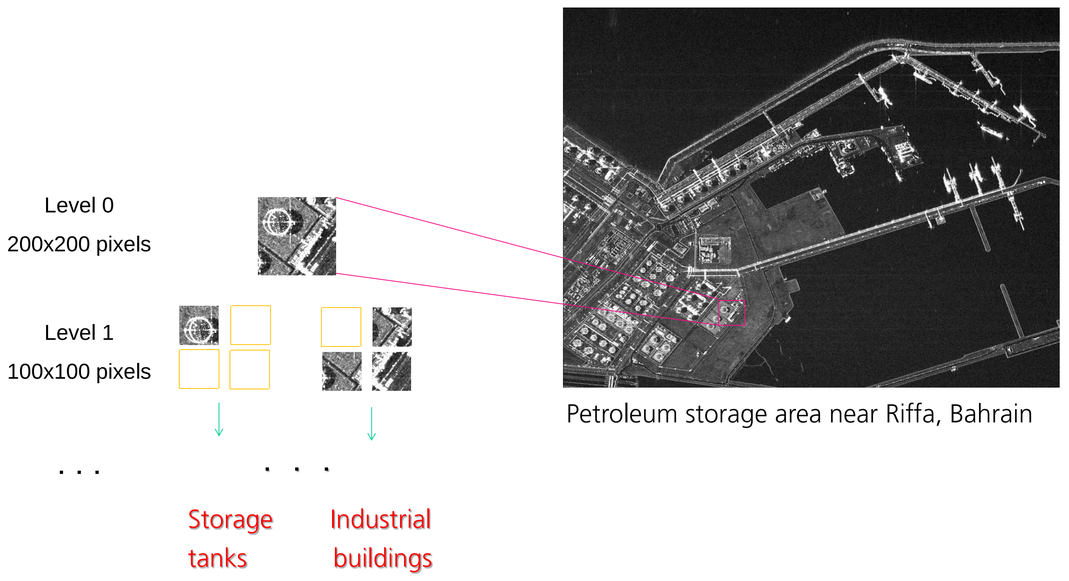



## Visual Data Mining



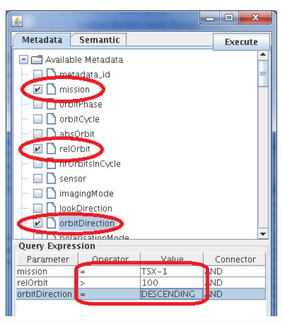

## Knowledge Discovery in Databases

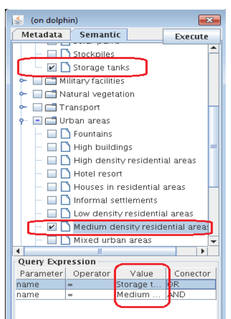


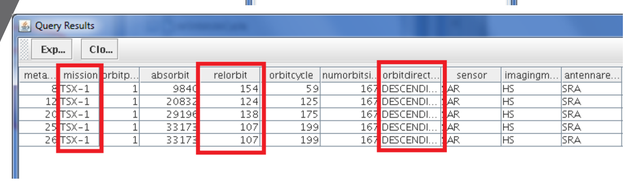


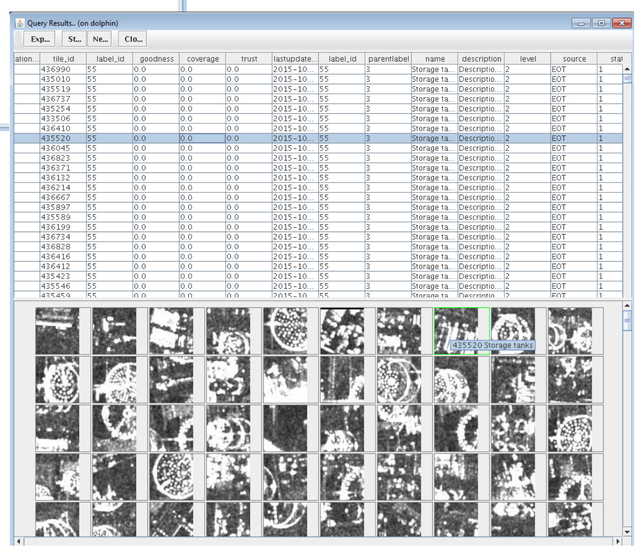

Petroleum storage area near Riffa, Bahrain

## Query Engine



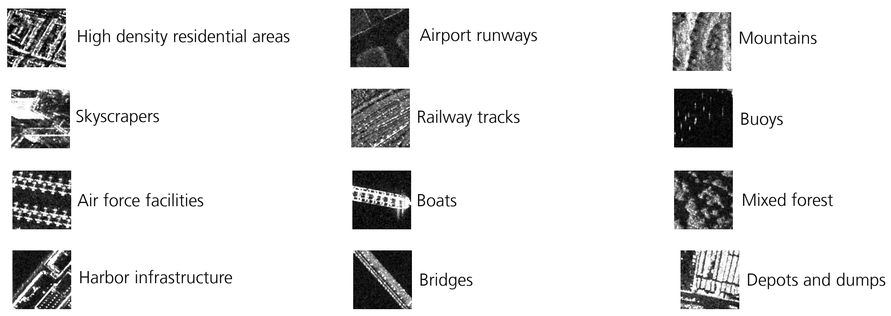




## Test Data Set

- Our test data set consists of 1100 TerraSAR-X products covering different urban and non-urban areas around the world.
- The selected TerraSAR-X products are multi-look ground range detected, radiometrically enhanced, high resolution Spotlight mode images with single polarization (HH or VV). Their pixel spacing is 1.25 meters with a resolution of about 2.9 meters. The incidence angle ranges from 25° to 52° with images taken from ascending and descending pass direction. The average size of the images is 4,200 × 6,400 (rows × columns).

## Taxonomy

- We applied a multi-scale hierarchical annotation scheme. A three-level concept with 150 categories in total, split into 9 high-level categories, 73 mid-level categories, and 68 detailed low-level categories. All categories can be labeled on three scales.




## References

[1] http://wiki.services.eoportal.org/tiki-index.php?page=EOLib

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