

Radar imagery application supporting actionable intelligence



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Background

The European Defence Agency was tasked by its Member States "to develop tools and applications to support EU operations with improved geo-information and satellite imagery, in coordination with EU Satellite Centre (EU SATCEN) and European External Action Service (EEAS) avoiding duplication" (EDA Capability Development Plan – Priority Actions 2014). Within this framework, in cooperation with EU SATCEN, the Agency contracted the REACT study ("Radar imagEry applications supporting ACTIONable intelligence") to contribute to fill this capability gap. In particular, considering the domain of Synthetic Aperture Radar (SAR), due to the inherent complexity of SAR data and large number of well-established procedures for optical image exploitation, SAR images are considered as an additional source of valuable information to support military operations and the decision making process. Improving the awareness of SAR data and, above all, procedures for its exploitation could increase its usage and operational benefits, either alone or in combination with electro-optical, bringing to the intelligence user community advantages in terms of visibility, capacity, acquisition timing and sensitivity to target behaviours.



Multi-coherence product from the execution of a workflow for damage assessment
COSMO-SkyMed image © ASI 2017

Objectives

The REACT study had the objective to give greater value to imagery data through identifying areas where military imagery analysts can be assisted by tools/workflows to produce valuable and possibly actionable intelligence. The study was focused on SAR imagery.

Who is involved?

The study was conducted in cooperation with the EU SATCEN that also acted as final user. A Study Expert Working Group was established where national experts belonging to the SATCEN communities provided the necessary expertise and guidance for the successful execution of the study activities.

FRONTEX followed the activities and actively participated to the Implementation Sessions.

The study was awarded to an international consortium composed by: e-GEOS, Telespazio Ibérica and INTA. The contract was signed in January 2016.

Methodology

The study was organized in two main work packages:

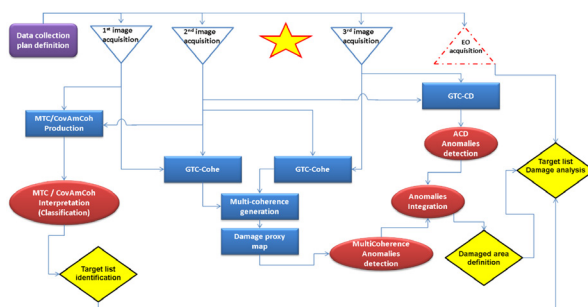
- I. Initial landscaping: definition of a list of workflows to support military imagery exploitation based on realistic operational scenarios/tasks.

II. Implementation Sessions: execution of selected number of workflows in a pseudo-operational environment: one session for military oriented workflows and another for FRONTEX activities.

Outcomes

The main deliverable of the study was the Workflow Description Document containing a wide broad description of the defined workflows; the document provided reference and assistance to the imagery analysts in the production of intelligence with satellite radar data.

An additional outcome was the increased knowledge in the use of radar imagery by the military communities.



Example of Damage Assessment workflow

Benefits

The activities resulted in the following benefits:

- enhancing the ability to manage the intrinsic complexity of working with radar imagery by providing practical information on each step of the workflows to be followed;
- supporting the establishment of effective working procedures for radar imagery exploitation involving the final users (imagery analysts);
- increasing the understanding of the pros and cons of using the several commercial software available for radar data exploitation;
- evaluating the state of the art of some new tools and algorithms for radar imagery exploitation (e.g Automatic Target Detection / Recognition).

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