



# FOLDOUT

Through-foliage detection, including in the outermost regions of the EU.



**FOLDOUT**

## OBJECTIVES

The FOLDOUT platform will assist border guards by providing prompt detection of illegal activity at borders and trace the movement and routes prior to arrival in border areas. FOLDOUT will build a system that combines various sensors and technologies and intelligently fuses these into an effective and robust intelligent detection platform. FOLDOUT will make the tasks of Border Guards simpler and faster by combining events from various sensors to give a complete situation threat assessment combined with suggested reaction scenarios.

With a two year pilot in Bulgaria and demonstrators in Greece, Finland and French Guiana, FOLDOUT will provide fundamental enhancements in the domain of border surveillance and improved search & rescue scenarios.

## DESCRIPTION

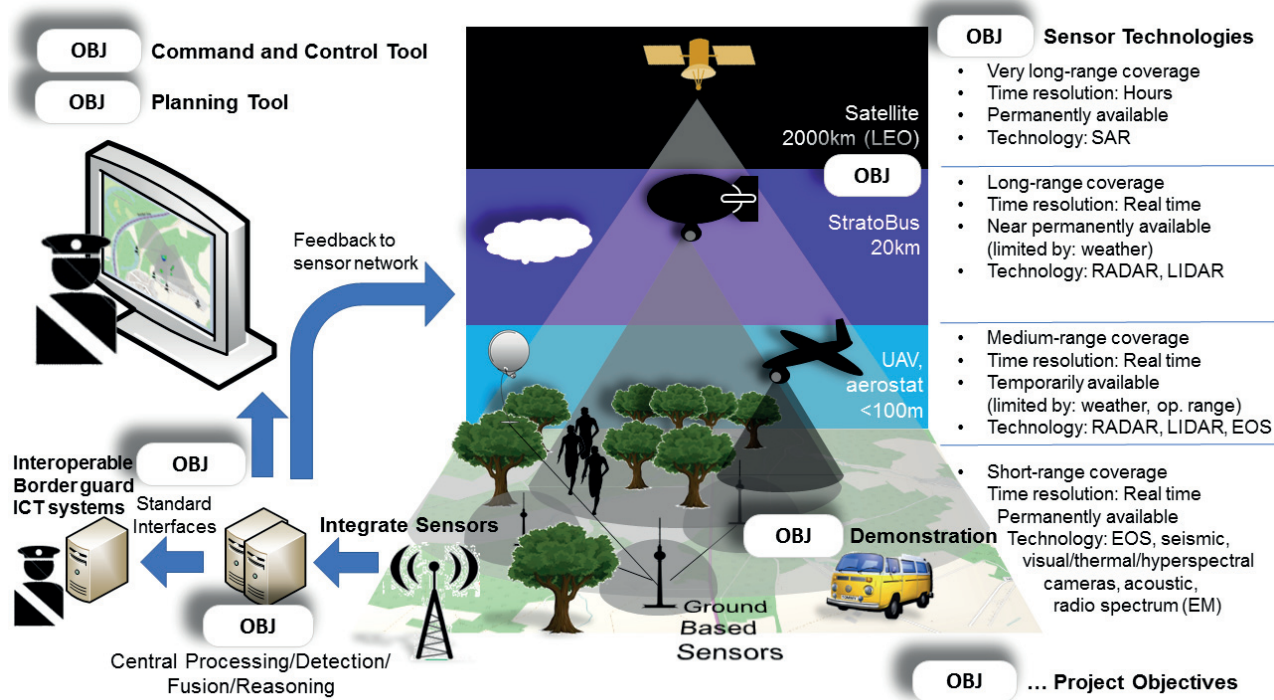
The technical concept of FOLDOUT is based on the combination of several sensor technologies on the ground and on special, high rising platforms with data fusion algorithms into a single, seamlessly integrated system. This concept allows for the real-time detection of critical events (e.g. illegal cross border activities, lost persons) even under dense foliage. The alarms are presented to border guard operators in a common operational picture in a unified data presentation for all sensors.

To penetrate the foliage to a certain extend under day and night conditions long range, multi-spectral, LIDAR and RADAR sen-

sors are used. For the surveillance of large border areas stratospheric platforms are employed to yield unobstructed field-of-view and unprecedented detection range for the sensors they carry. Ground EM (radio transmitter detection), acoustic and seismic (movement) detectors will deliver complementary data where the vegetation is too dense to penetrate. The activities at the fringe of the foliage, such as suspicious car traffic, are monitored by conventional ground-based cameras and EOS sensors completed by satellite SAR data. Unmanned vehicles will be employed on demand to scan areas where sensor coverage is too low or data received are ambiguous.

All the different sensors are integrated in a common system and data model to provide information on different aspects and in a different light spectrum or modality or even on a different time resolution or scale. Data processing algorithms based on machine learning will therefore be used to fuse and reliably interpret all data to derive alarms on the presence of persons or critical situations in the surveilled area. Reasoning methods will be used to filter unusual from usual behavior in the surveillance area. To reduce operator workload and improve situational awareness sensor information and alarms are uniformly presented to the operator on a command and control software tool. The tool will provide a map-based graphic user interface with a standardised symbology to observe, track and react with maximum efficiency.





## EXPECTED RESULTS

The main result of FOLDOUT is to develop, test and demonstrate a system and solution to detect and locate people and vehicles operating under the coverage of trees and other foliage over large areas. FOLDOUT will:

- Develop requirements closely together with the end users, e.g. border guards;
- Improve sensor technologies with innovative approaches specifically adapted to through foliage detection scenarios, functioning at day as well as night time and in harsh environment;
- Improve situational awareness through fusion of advanced aerial and space-based sensor platforms with ground based sensors into one surveillance solution;
- Demonstrate the effectiveness of the FOLDOUT concept in realistic operational scenarios;
- Provide a planning tool for decision makers to configure a surveillance system for the specific requirements of a target deployment area;
- Create a scientific/industrial development community and putting at their disposal a set of reference data, which will be used to tune and assess the analytics performance.

## FACTS

- Funding Type: EU Horizon 2020
- Total Cost: € 8,199,387.75
- EU Contribution: € 8,199,387.75
- Starting Date: 01.09.2018
- Duration: 42 Months
- End Date: 28.02.2022

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