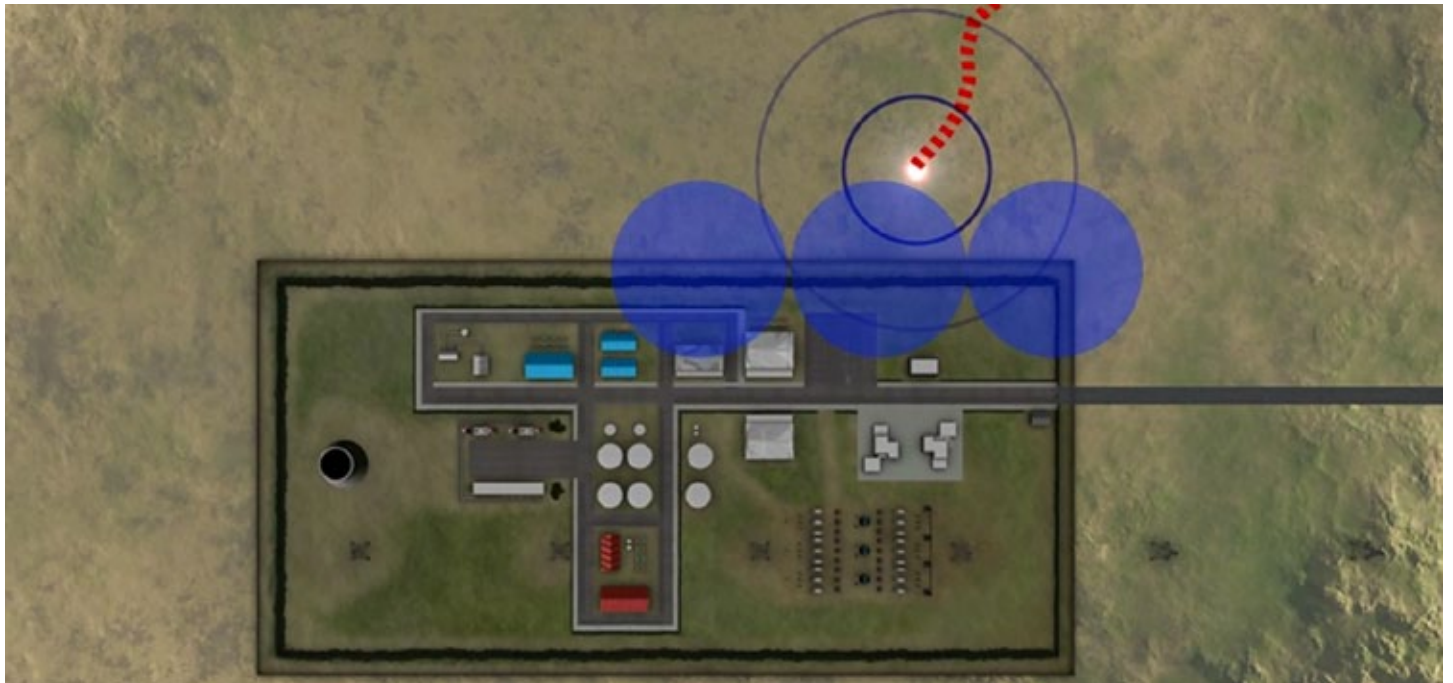




INFRASTRUCTURE PROTECTION AND INTEGRATED SURVEILLANCE SECURITY SYSTEM



Perimeter Seismic UGS detection

BASYLIS / MOBILE, AUTONOMOUS AND AFFORDABLE SYSTEM TO INCREASE SECURITY IN LARGE UNPREDICTABLE ENVIRONMENTS

Introduction

Civil installations such as power plants are often isolated and located in wide and remote areas. Furthermore, in the future, the number of small distributed facilities will increase as a direct result of new European environmental policies that aims to increase societies' resilience to climate change.

The protection of fragmented assets is difficult to achieve and requires portable and cost affordable security systems. BASYLIS project has addressed these issues by developing a low-cost smart sensing platform that can automatically detect a range of security threats in complex environments, such as forest, mountain, and desert.

BASYLIS security solution combines RADAR, LADAR, Acoustic Vector Sensors, Unattended Ground Sensors (UGS), Seismic UGS, bracelets for personal security and video Intelligence for alarm recognition and classification.

The system provides behavioral analysis tools which processes the signals received from the sensors in the system and together with social science determines the threat and its grade.

Within the scope of the project:

- Radar, ladar, UGS Acoustic (UNAVE), UGS metal, Seismic UGS Optimization, bracelets/panic buttons, COTS integration board and video intelligence sensors has been developed, focusing on their potential cross-integration with the others.
- Multitracking and behaviour analysis tools have been developed to identify threats detected by different sensors.
- System has been tested in a real critical infrastructure facility.
- The system is compliance to the privacy rules in the European Union.

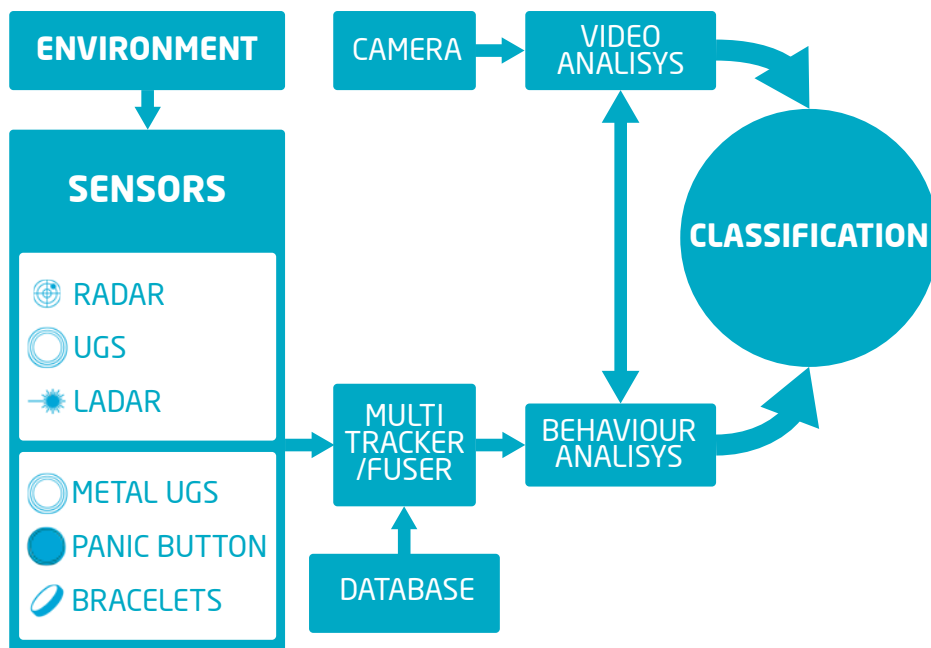
BASYLIS system has been developed in the scope of a R&D project funded by the European Commission, by a consortium that consists of several companies and academic institutions all over Europe: Indra Sistemas (Spain) as project leader, New Technologies Global Systems (Spain), Università Degli Studi Di Firenze (Italy), Terma A/S (Denmark), Microflown (The Netherlands), Mirasys Oy (Finland), Universidad Politecnica De Madrid (Spain), University Colleague London (United Kingdom) and Centro Nacional de Protección de Infraestructuras (Spain) as technological stakeholder.

System deployment

As it is shown in the diagram, the sensors are deployed around the critical infrastructure according to the range of coverage of each one. When there is a potential threat, firstly the radar will detect it, which is the sensor with highest range of coverage, the blind areas are covered by the ladar, then as the threat gets closer to the critical infrastructure will be detected by the rest of sensors in the order that follows: personnel sensors, Metal UGS, Acoustic vector sensors and finally will be verified by the camera. The inner areas within the protected area also will be covered with BASYLIS system.

When the potential threat arrives to the destination, the critical infrastructure, the security staff will have the following information about the threat: The path done by the threat, its speed, the object is armored or not, bracelet or not bracelet carrier (if it is, it is not a threat), threat classification: person/vehicle.

BASYLIS is an autonomous system for wide area protection, easy to deploy and easy to gather



System performance

When an object enters in the protected area (environment) the sensors generates an alarm. The alarms generated by the sensors are sent to the multitracker/fuser which merges alarms coming from different sensor for the same object (overlapped coverage) in a single alarm. The single alarm will be sent in a standard format (as virtual sensor) to the Behavioural Analysis module.

The Behavioural Analysis will automate the identification and classification of suspicious behavior of the objects (potential threats) and will set the level of risk for the threat. In order to reduce the false alarms ratio, Behavioural Analysis module can request Video analysis for determining the classification of the suspicious object.

All the data processed by the system is stored for keeping the track of the system. The video image is not recorded (but the images can be stored to increase the security) in order to preserve the privacy of the people involved in the area protected with BASYLIS security system.

