



## SUBITO Report Summary

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### **Periodic Report Summary 1 - SUBITO (Surveillance of unattended baggage and the identification and tracking of the owner)**

The SUBITO project has been designed to research and further develop novel technology for automated, real-time detection of unattended baggage (UB) and the fast identification of the individual responsible. The project is guided by end-user driven requirements to ensure that security personnel receive the technologies they need in order to deliver improved threat security.

The project will culminate in a demonstration at an end user site, operating with existing CCTV technology and demonstrating:

- fast detection of baggage that has been abandoned;
- fast identification of the individual who left the baggage; and
- fast determination of their location or path they followed.

The key requirements for the SUBITO system were derived from a series of discussions held with end-users, generating a view on the decision logic applied by operators to the problem of UB. Building on the defined requirements, the system architecture design has been completed which defines the system components, functions and data flows necessary to ensure that the architecture complies with the system requirements. A privacy impact assessment will be carried out based on the system architecture to ensure that privacy issues, either legal or ethical, resulting from the design process are identified and can be addressed.

Algorithms have been developed with the capability to robustly detect and segment all moving objects within the monitored scene, using techniques such as facial detection, carried object detection, detection using pan-tilt-zoom (PTZ) camera 'tours' etc. to improve robustness. State of the art algorithms are being developed and tested that operate using multi-view detection that will better handle occlusions and provide more accurate localisation of detected objects. Improvements have been made in the operation of facial detection algorithms where image resolution is reduced and head pose varies considerably from the existing norm.

A multi-view tracker has been implemented to track objects in 3D, while comprehensive track management is provided by a multiple hypothesis tracker, evaluation results from which have demonstrated the ability to resolve short term occlusions and reduce the number of false alarms. Algorithms designed for discriminating people and baggage provide robust classification of objects.

A rule based system has also been created that evaluates these critical situations and generates a reliable threat assessment. Evaluation tests show that by introducing the notion of ownership between UB and individuals, the performance is greatly improved. Supporting studies have been completed that investigate the potential performance benefits to be gained through the use of enhanced CCTV, other sensors and distributed processing in the system.

The output from SUBITO is expected to significantly improve the capability of intelligent CCTV systems to robustly detect an UB and identify and track its owner. This will offer security improvements that can be adopted by industry, integrating new surveillance software into existing and future CCTV, thereby benefiting the security of all European citizens. SUBITO is also expected to generate technologies in the areas of CCTV image segmentation and analysis, facial recognition, behavioural analysis and people tracking.

The emphasis of SUBITO is to develop and demonstrate the incremental improvements that can be achieved by adding layers of increasing sophistication to already existing technology and infrastructure, This approach recognises that a high level of investment in new technologies has been made in this area and yet the systems still fall considerably short of meeting the end users requirements. The output from the SUBITO project are designed to produce a robust yet scalable solution that can be built around an end users previous investment offering improved security at reduced cost.

### **Related information**

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## Subjects

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### [Security](#)

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