SEC-19-BES-2016: Data fusion for maritime security applications

EXUS INNOVATION

Research at EXUS

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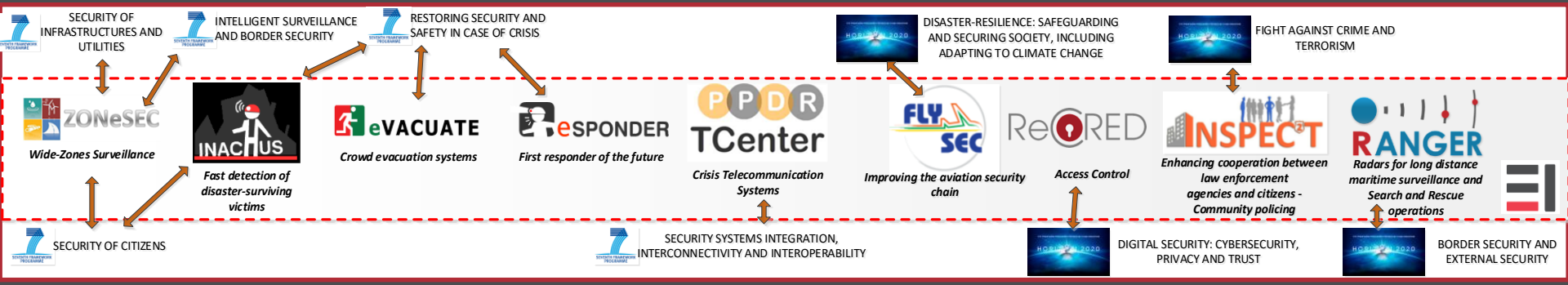
19 on-going projects
12 as coordinator

Security | ICT 4 Health | Creativity & Learning

Data Technologies

Security Group – Current projects / Key people



Alex Bartzas
Research Consultant

Dimitris Petrantonakis
Research Consultant

Panos Zakynthinos
Research Consultant

Angelos Katsis
Senior Software Engineer

Odysseas Bournas
Senior Software Engineer

Thomas Bolis
Senior Software Engineer

Dimitris Kanakidis
Security Research Group Leader

Dimitris Vassiliadis
Head of Innovation

The Problem

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Optimization of the surveillance of the EU maritime area and its maritime borders

Improvement of the situational awareness and increase reaction capability at the external borders of the Member States of the Union

For

detecting, preventing and combating illegal immigration and cross-border crime, and contributing to ensuring the protection and saving of lives of migrants

Current Situation

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Large amounts of “raw” data are being collected:

- **at unprecedented scale,**
- **coming from different sources,**
- **from different sorts of assets**
- **from different EU Member States,**
- **from the Internet and social networks,**
- **gathered for different security purposes,**
- **in a variety of formats**

BUT

not necessarily exploitable because they are not accessible at the same time nor interoperable

SEC-19-BES-2016

“Data fusion for maritime security applications”

Type of action: Innovation action – Leading to prototype(s) up to Technology Readiness Level (TRL) 7

Indicative budget: contribution from the EU of €8m

What is needed (1/3)

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Data to be “fused” and made “understandable” to all systems supporting information exchange, situational awareness, and decision-making and reaction capability at the EU external maritime borders

CORE 1 - Intelligence correlation to produce higher level (or more accurate) information by:

- **mixing several homogeneous data**
- **pre-processing raw data and associating heterogeneous data**
- **generating surveillance pictures without redundant objects/tracks**
- **exploiting sensors of various types and installation location**
- **combining offline with real-time data**

BASED ON LEGACY SYSTEMS

What is needed (2/3)

Data to be “fused” and made “understandable” to all systems supporting information exchange, situational awareness, and decision-making and reaction capability at the EU external maritime borders

CORE 2 - Ensure interoperability by:

- aligning with CISE data model
- building on results from pre-existing EU-funded R&D cooperative projects
- following pre-standards in the context of ESO
- synergies being established with projects funded by the EDA programmes
- engaging a significant number of various end-user organizations

What is needed (3/3)

Data to be "fused" and made "understandable" to all systems supporting information exchange, situational awareness, and decision-making and reaction capability at the EU external maritime borders

CORE 3 – Extensive validation pilot activities:

- **demonstrating interagency and cross-border cooperation**
- **fitting the existing systems and the actual concepts of operations set for missions involving the assets of several Member States maritime border surveillance, security and search-and-rescue organisations**

2 Large scale demonstration pilots envisioned

Solution: D-FUSE

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Data Fusion for Unprecedented maritime Surveillance Effectiveness

Core Objectives:

- Thorough analysis of existing systems and gaps in maritime surveillance
- Multilayer Data Fusion, mixing existing maritime surveillance sensor data and other data sources
- Decision Support system exploiting Big Data analytics
- Technical solutions (TRL7) tested and validated in minimum 4 Piloting activities

Solution: D-FUSE

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Data Fusion for Unprecedented maritime Surveillance Effectiveness

Partners:

- EXUS: IT Technology provider - Coordinator (UK)
- World-class scientific research and experimentation center (Belgium)
- Large Research Institute (Greece)
- Industrial Technology provider (France)
- Large Research Institute (Finland)
- Industrial Technology provider (Portugal)
- Satellite technology and services provider (France)
- END-USERS from Greece, Italy, Malta, Spain, Portugal, France TBC

Potential Role of End-Users

A. Main contribution in Generic and Pilot-specific Mission and Operational Requirements Elicitation
   - Cooperate to achieve Interoperability with legacy systems
   - Provide requirements and co-determine the D-FUSE Graphical User Interface

B. Main Contribution in Pilot Scenarios development and refinement
   - Testing and Validation of the System through organization of one Pilot test case
   - Pilot evaluation and Lessons Learnt
   - Contribution to standards / EU Regulations

Potential Role of End-Users

Two alternatives are foreseen:

1. Light involvement related to point A. Main contribution in Generic and Pilot-specific Mission and Operational Requirements Elicitation

    - Manpower: ~0.5 PY

2. Strong involvement related to point B. in Pilot Scenarios development and refinement and point A.

    - Manpower: ~1 PY + team of 3-4 people during the trial preparation and execution period.

Dr. Dimitris Kanakidis
dkan@exus.co.uk
Dr. Dimitris Vassiliadis
dvas@exus.co.uk

http://www.exusinnovation.co.uk

Tel: +30 210 7450300
Fax: +30 210 7450399