INFRA

Innovative & Novel First Responders Applications

Project objectives

The fundamental objective of the INFRA project is to research and develop novel technologies for personal digital support systems, as part of an integral and secure emergency management system to support First Responders in crises occurring in Critical Infrastructures under all circumstances.

The specific objectives of the project fall under the following categories:

- Communications objectives, which involve the research and development of an integral and interoperable wireless communications system that will allow First Responders to have reliable means of communications as they enter subway tunnels and buildings with thick concrete walls.
- First Responders objectives, which entail the R&D of a robust indoor-site navigation system based on three location sensors (an inertial sensor, a wireless sensor and a video sensor), a video annotation system for First Responder PDAs, sensors for real time identification of radiation exposure and hazardous materials and applications for gas leakage and hidden fire detection.
- Standardization objectives, which includes R&D of a European level proposal for the standardization of the framework of communications and applications as proposed by INFRA.
- Demonstration objectives, which consist on the demonstration of the validity of INFRA's standards, communications and First Responder applications being developed.

Description of the work

The work to be developed is comprised of the following areas:

The Critical Infrastructure Broadband Communications Base area will cover advanced wireless broadband network technology that is specially adapted to the needs of First Responder teams in Critical Infrastructure sites. The network shall support video, data and voice communications and it will consist of multi-radio mesh topology with self- adaptive and self-healing functionality.
The Critical Infrastructure Open Interoperability Standard area will cover the development of a highly dynamic system of systems made up of elements that interact with each other in unplanned and spontaneous ways. It will also cover the development of a First Responder oriented network-programming platform that will implement the systems-of-systems nature of First Responder applications and communications.
In addition, the abstraction level provided by this communication layer will be able to support future applications that will conform to the INFRA specifications, aiming to lay the foundation for a European First Responder interoperability standard.
The Communications Space will provide an unprecedented level of interoperability for voice and data communications. All First Responder teams, First Responder command posts and the Critical Infrastructure control centre, regardless of their radio technology, will be able to communicate with each other. Furthermore, First Responders will be able to use their legacy equipment inside buildings with thick concrete walls and in underground tunnels, where typically radio RF propagation is impaired. The Application Space will provide novel technologies and applications for the use of First Responders in Critical Infrastructure sites. These shall be Site Indoor Navigation (based on inputs from three independent tracking sources for increased reliability and accuracy), Thermal imaging (including gas-leaks detection and hidden-fire detection), Advanced Sensors (robust and lightweight fibre optic based sensors for the detection of hazardous materials) and Video Annotation (annotated with symbols and graphical components through dedicated authoring tools and short textual descriptions that aim at focusing the attention of the First Responder on a specific part of the picture).

Expected results

To create an open, standards based interoperability layer that will allow:
- Broadband access for high bandwidth applications.
- Autonomous wireless broadband in underground tunnels and concrete buildings.
- Full voice and data communication interoperability between all First Responder teams.
- Full interoperability of First Responder applications.

To provide practical and useful novel applications for First Responder teams, including:
- Thermal imaging applications.
- Video annotation.
- Advanced fibre-optic sensors.
- Indoor navigation system.

INFORMATION

Acronym :
INFRA

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€ 2,642,895

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24 months

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