

eVACUATE / A holistic, scenario-independent, situation-awareness and guidance system for sustaining the Active Evacuation Route for large crowds



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Information

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Project objectives

The dynamic capture of situational awareness concerning crowds in specific mass gathering venues and its intelligent enablement into emergency management information systems, using smart communication devices and spaces is critical for achieving rapid, timely guidance and safe evacuation of people out of dangerous areas. Humans could be overwhelmed by fast changes of potentially dangerous incidents occurring at confined environments with mass-gathering. They could fail to make objective decisions to find their way to safety. This condition may lead to mass panic and make emergency management more challenging. To cope with these incidents, eVACUATE yields a holistic system:

- » To provide a valuable tool to guarantee enhanced Situational Awareness both to the crowds involved during a crisis but also to the crews operating in situ as well as in remote locations (security crews, first responders, crisis managers)
- » To adapt dynamically evacuation plans according to current conditions
- » To provide an easy to use (visual, multi-lingual) set of safe evacuation instructions available over a multitude of alternative and complementary presentation channels under a resilient, reliable and robust way, regardless of the functionality of the "global network"
- » To support civil protection authorities in the formation and validation of proper safety procedures for crowd management (Reconstruction of Experiences)
- » To set a cornerstone for the standardization of equipment, processes and methodologies for evacuation purposes on an EU level, addressing the cross-cultural issues emerging from diversity imposed by citizens

Description of the work

The overall mission of the eVACUATE consortium is to research, develop and demonstrate the capabilities of a framework that will enhance the effectiveness of complex crowd evacuation operations by:

1. Defining a full architecture and developing underlying necessary technological backbone, designed to provide improved data fusion, interconnection and interoperability between the different system elements and layers, reducing data ambiguity to a minimum.
2. Providing a full-set of systems and services built in accordance to innovative, integrated standards and peer-to-peer architecture, supporting a variety of complex crowd evacuation operations. This will be achieved with:
 - » Monitoring crowd behavior, surveying current environmental conditions, controlling the evacuation flow and predicting incidents that could cause problems to the overall operations
 - » Dynamically simulating an evacuation in a faster than real-time way so as to predict potential (future) incidents evolving as a consequence of other current events, through a game awareness framework
 - » Developing a centralized Data Fusion Mediation System (DFMS) to provide together with the command and control modules, the web portal and the back-end applications, an accurate and intelligent coordination of activities during evacuation operations and decision making
3. Integrating different innovative and existing modules such as:
 - » Multiple types of sensors ranging from visual cameras and hyper-spectral imaging to RFIDs and pervasive technologies,
 - » Sophisticated early location devices, based on Wireless Sensors Networks consisting of low-power sensors nodes
 - » Communication between first responders, command

centers and the crowd itself with integrated networking platforms and ad-hoc mechanisms to guarantee resilient communications

and performing the necessary hardware and software enhancements, so that all involved system elements can be seamlessly integrated to the main platform while interoperability is ensured.

4. Studying and developing the underlying socio-economic environment by addressing ethics, legal issues, regulation societal context, standardization and National and International operating procedures

5. Demonstrating the developed system and validating its operational characteristics in full-scale field trials that

will simulate realistic emergencies and crises. The whole system will be tested involving four different evacuation scenarios: a Football Stadium Scenario, an Airport scenario, a Cruise ship scenario and an Underground (Metro) scenario.

Expected results

eVACUATE foresees to develop an evacuation platform and strategy which through enhanced situational awareness will guide people away from the dangerous situations. In addition, eVACUATE is anticipating to increase effectiveness of forces responding to crisis in view of leading crowd to safer zones while reducing collateral damage, human errors and achieving faster restoration of security at the events venue and its affected proximities.

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