LocON: key solution for tomorrow's monitoring and controlling of large scale infrastructures

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LocON – the Goals

Concept and validation of

- a key solution
- generating innovative control services
- based on context awareness
- in any environment (indoor, outdoor)
- Airport as show case

Broadening of the concept of „location based services“ to safety and security related applications in indoor and outdoor environments
Weakness in airport installations to support the coordination of the increasing number of aircraft operations

The LocON system helps an airport operator to monitor and control all ongoing operations by measuring and analysing the location of all members of staff and objects in the overall environment and automatically rises alarms only in relevant situations.

Thus LocON has the potential to increase safety, security and efficiency of an airport operation.
Assistance for Operators - Safety and Security
LocON – Technologie Challenges

New Context Aware Services
- control / monitoring
- surveillance
- guidance
- decision support

- Innovative control services
- New middleware platform
- Spatio-temporal context
LocON: Cooperation of several Locating Technologies
LocON – New System Architecture

Location Aware Control Services
(Business Logic server)

Platform
(Middleware)

External Systems & data providers

Integrator Tool

Seamless fusion
LocON protocol

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Service oriented architecture (SOA)

Event driven architecture (EDA)

Locationing subsystem

Gateway

Sensors & Actuators

Gateway

Gateway

Gateway

Sensors

Locating subsystem

Business Logic server
The sensor fusion requires some sort of Quality of Location indication: How can we be sure that QoL reported by sub-systems is accurate?

- Variance factor analysis allows to quickly assess the quality of location indicators
- It allows for on-the-fly benchmarking and re-calibration without the need for expensive external measurements
- Systematic errors can be captured to some degree, if the data is fused from multiple sources
Deployment of LocON in Faro Airport

1. Fraunhofer IIS – 2.4 GHz RFID
2. INOV: GPS/EGNOS
3. Symeo: LPR (5.8 GHz) /GPS
4. CEA-LETI: UWB (4-5 GHz)
5. CIT: WiFi (2.4 GHz)
Seamless Fusion: Example

GPS (D-GPS / EGNOS)  LPR  GPS+LPR in fusion

GPS (D-GPS / EGNOS)

LPR

GPS+LPR in fusion
LocON in other applications

- Safety and security of persons, of equipments and workprocesses
- Coordination and organization support
- Detection of traffic / business rules infringements
Thank You....

www.ict-locon.eu

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Key solution based on

- **new system concept**
  context awareness in the overall area: integration of all available locating systems (satellite based navigation, RTLS*, RFID) with **seamless fusion**

- **locating technologies independent layer**
  ➔ **LocON protocol** – LocON gateway

- **new middleware platform**
  ➔ event driven architecture
  ➔ sensor and data **fusion**

* RTLS: Real-time Locating System
LocON - R&D project

- Research and Development project from the seventh framework programme of the European Commission (FP7)
- Key target of the programme: Networked embedded and control systems
- Medium-scale focused research project (STREP)
- 9 European partners involved
- Started in June 2008
- Duration 33 months
- Project volume: 3,8 Mio €
LocON – the consortium

Project coordinator
Locating system, Coexistence of radio systems

Research Institute
Locating system
Data Fusion

End user
Operator of airports

Industry
Commercial
Locating system

SME
Platform design

Research Institute
Communication system
GPS/EGNOS

SME
System Integrator

University
Middleware, Tools Design

Research Institute
Locating system

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Seamless Fusion: Sensor Fusion

Example: 4 vehicles (located outside on the apron) and 2 staff members (one outside and one in the terminal)