ALICE – Assistance for Better Mobility and Improved Cognition of Elderly Blind and Visually Impaired

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Context
- VI persons face problems with overall contextual understanding of space semantics and interaction with surrounding objects
- VI persons have serious difficulties with planning, orientation, communication and navigational skills
- GPS accuracy reaches precision of down to 50m in urban environments
- WHO reports that there are 285 million registered visually impaired people (39M blind, 246M with low vision)
- The degree of visual impairment is increasing with an ageing population

Project outline
- 7 partners (academic, SMEs, visually impaired persons associations) from 4 countries (ES, FR, SI, UK)
- Duration: June 2012 – November 2014
- Final product: device consisting of smartphone with additional sensors, wirelessly connected with local processing unit

Challenges
- Limited computational resources: light portable devices
- Real time responsiveness
- Reliability and no false positives
- Adequate, non-overwhelming communication with the user (alerts, indications)

Objectives
- Provide navigational assistive device for elderly blind with cognitive capabilities: positioning, obstacle detection/alerting, landmark/object recognition
- Offer VI users a cognitive description based on a fusion of perceptions gathered from multiple sensors

First achievements

Pilot device and data collection
- Sensor performance benchmarking
- Pilot device configuration and setting
- Test videos collected from urban areas (Ljubljana, Paris)

Navigation assistance

User interface prototype

Future work
- Learning and recognizing user-defined landmarks and objects of interest
- Obstacle classification according to degree of risk to the user and generation of adequate alerts
- Improve navigation and recognition at key points of trip (start and finish)
- Navigation and obstacle recognition modules integrated into a single application