Intelligent Sensor Network

Simulation Environment for Test and Demonstration
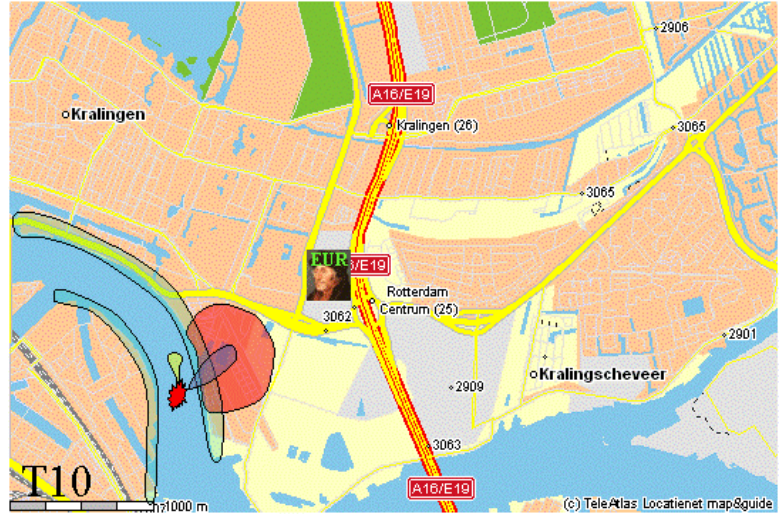
By Peter van Lith - RI

The Combined Project

- During a disaster information is generally available but not shared by all parties
  - Firemen may enter a building while the police knows there are no people inside anymore
  - Ambulance people send people away from disaster area not knowing exactly what is happening elsewhere
- The combined project provides facilities to collect, enhance and distribute information during disasters
  - Usage of a variety of sensors
  - Usage of information from other sources
- How can we demonstrate and test such a system
  - The proposed simulator must make this possible

Simulator

- Display a map of the area

- Display all current sensors using GPS location

- Show status of all sensors

- Connect to other system functions using Agents

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- Mobile phones used as sensors using SMS interface
  - Is a separate project
- Existing sensors like 'sniffer-poles' and traffic loops
  - Wrapping sensor in software layer to process information
- Virtual sensors
  - Simulating real sensors to allow testing and demonstrations
  - Sensor values given in script file, consisting of scenario
- Sensor Suite
  - Sensor unit consisting of camera, GPS and Gas Sensor
  - Is mobile or can be mounted on rescue vehicle

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- Consists of scenes, describing a time series of events
- All sensors and sensor values are described in script file
  - XML file with alle definitions
  - Commands to show different viewpoints
  - Comment to explain what is going on
- Combination of real and virtual sensors
  - A Gas sensor could be used in a demo, pretending to be in the disaster area and showing the effect of sensing a gas concentration
  - Usage of mobile phones to collect information
    - E.g. Do you smell gas?
    - SMS answer: Yes

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- All definitions of maps, sensors etc
- Contact with other systems using Agents
  - Distributed Perception Network (DPN) reasons about conclusions to be drawn from sensor readings
  - Should be displayed on the map
- Simulator to be called by other systems
  - Acts as an Agent
  - Provides data to other systems using a Web Service interface
  - Simulates behavior of hardware sensors

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Using the existing definitions, develop a first version that contains the desired functionality:

1. Display a map, using GPS location information
2. Display all sensors in a simulation run
3. Generate sensor data and provide these to other processes using a Web Service interface
4. Activate the DPN and receive conclusions
5. Display conclusions in the map

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