Demonstration: Dynamic Sensor Registration and Semantic Processing for ad-hoc MOBILE Environments (SemMOB)

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Why Dynamism?

First responders have limited time to analyze sensor (on and around them) observations. There is a team of them making it further difficult for analysis.

There are a variety of sensors used to monitor vitals of firefighters, location, and poisonous gases.

- Footsteps
- Heart rate
- GPS
- CO
- O₂
- CO₂
- Accelerometer
- Compass

Firefighters need to combine prior knowledge of fires and its behavior, extinguishers, and floor plan of the building for rescue strategy and operations.

Sensors on each responder provides different view of the event and they need to register dynamically as the firefighters arrive.

Semantic Web allow us to describe the domain, sensors, and first responders -- apply reasoning techniques to derive actionable insights.

http://affiliatemarketerstoolbox.net/onfire/
SemMOB Architecture

Dynamic registration
Reasoning
Leverage LOD
SOS standards
Modeling Sensors

Modeling accuracy of sensors

Modeling named locations of a system used later by the reasoner

http://www.w3.org/2005/Incubator/ssn/wiki/Sensor_Discovery_on_Linked_Data
SSN XG Model Depicting Basic Sensor Modeling Concepts

http://www.w3.org/2005/Incubator/ssn/wiki/Report_Work_on_the_SSN_ontology
SSN XG Concepts for Modeling Observation Time

Modeling observation time

http://www.w3.org/2005/Incubator/ssn/wiki/SSN_Observation
SemMOB: Sensor Model
Leveraging Mobile Devices using SemSOS

Mobile applications for data collection and reporting

Abstractions that are intuitive to decision makers and first responders.

SemSOS: Semantic analysis and reasoning over sensor observations

GeoNames

Linked Open Data
SemMOB Visualization

Map showing sensor locations

Query interface

Sensors reporting observations in real-time

Authentication Screen

Sensors reporting observations to SemSOS
Oxygen: 410.66
CO₂: 742.05
CO: 911.35
References

   http://www.w3.org/2005/Incubator/ssn/wiki/SSN
   http://www.w3.org/2005/Incubator/ssn/XGR-ssn-20110628/

   WonderWeb Deliverable D17. The WonderWeb Library of Foundational Ontologies
   and the DOLCE ontology, Preliminary Report (ver. 2.0, 15-08-2002).


[4] Cory Henson, Josh Pschorr, Amit Sheth, Krishnaprasad Thirunarayan,
   International Symposium on Collaborative Technologies and Systems (CTS

[5] GeoNames web service and ontology:
   http://www.geonames.org/ontology/documentation.html

   source edition (http://virtuoso.openlinksw.com/).