Context is Highly Contextual!

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Context is highly contextual!

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Context

The set of facts or circumstances within a surrounding environment
For example,

A physical context would include a set of **objects** and **events** within a region of **space** and **time**

... also known as a **situation** (or situational context)
To effectively represent physical context,

We must have a way of modeling **space, time, objects, and events**

... in addition, we must model **sensors** and **observations** used for detecting objects and events
There is current research on modeling each of these domains with ontologies

- **Space**  W3C Geospatial Incubator Group
- **Time**   W3C OWL-Time Ontology
- **Objects** Internet of Things
- **Events** EventWeb (Ramesh Jain)

- **Sensors and Observations**
  - W3C Semantic Sensor Networks Incubator Group
In order to represent physical context, there is a data-to-knowledge progression from

• real-world phenomena (of multiple types), to
• raw observational data (of multiple layers), to
• object and event information (of degrees of complexity), to
• situational context knowledge
Situational Context Pyramid

- Physical Phenomenon
- Raw Observation
- Object Identification
- Event Identification
- Situation Awareness

Expressiveness

Knowledge
Information
Data
“Real World”
how do you construct for situations of varying complexity such as:

• event in general (starting with spatial, temporal and thematic properties)

• events for which you have multimodal information (and various levels of abstractions)

• events in the context of ambient intelligence (such as when sensors have observed what a human is doing and has an idea of his/her activity)

• events for which there is both computerized digital information and perception (such as those captured by sensors) and human perception (potentially with nuance of languages and associated social context including emotions, sentiments, etc.) and cognition

• above with history
References

• Kno.e.sis project on Semantic Sensor Web: http://knoesis.wright.edu/projects/sensorweb/

• W3C, Time Ontology in OWL, http://www.w3.org/TR/owl-time/

• W3C, Geospatial Incubator Group, http://www.w3.org/2005/Incubator/geo/