Social Life Networks: Ontology-based Recognition

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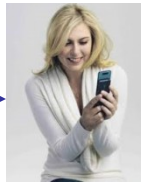
Relevant Trends

- Social Networks and their role in communication
- Micro-blogs becoming major source of News.
- Internet of Things is emerging.
- More than 75% of the world poulation owns a mobile phone.

Social Networks

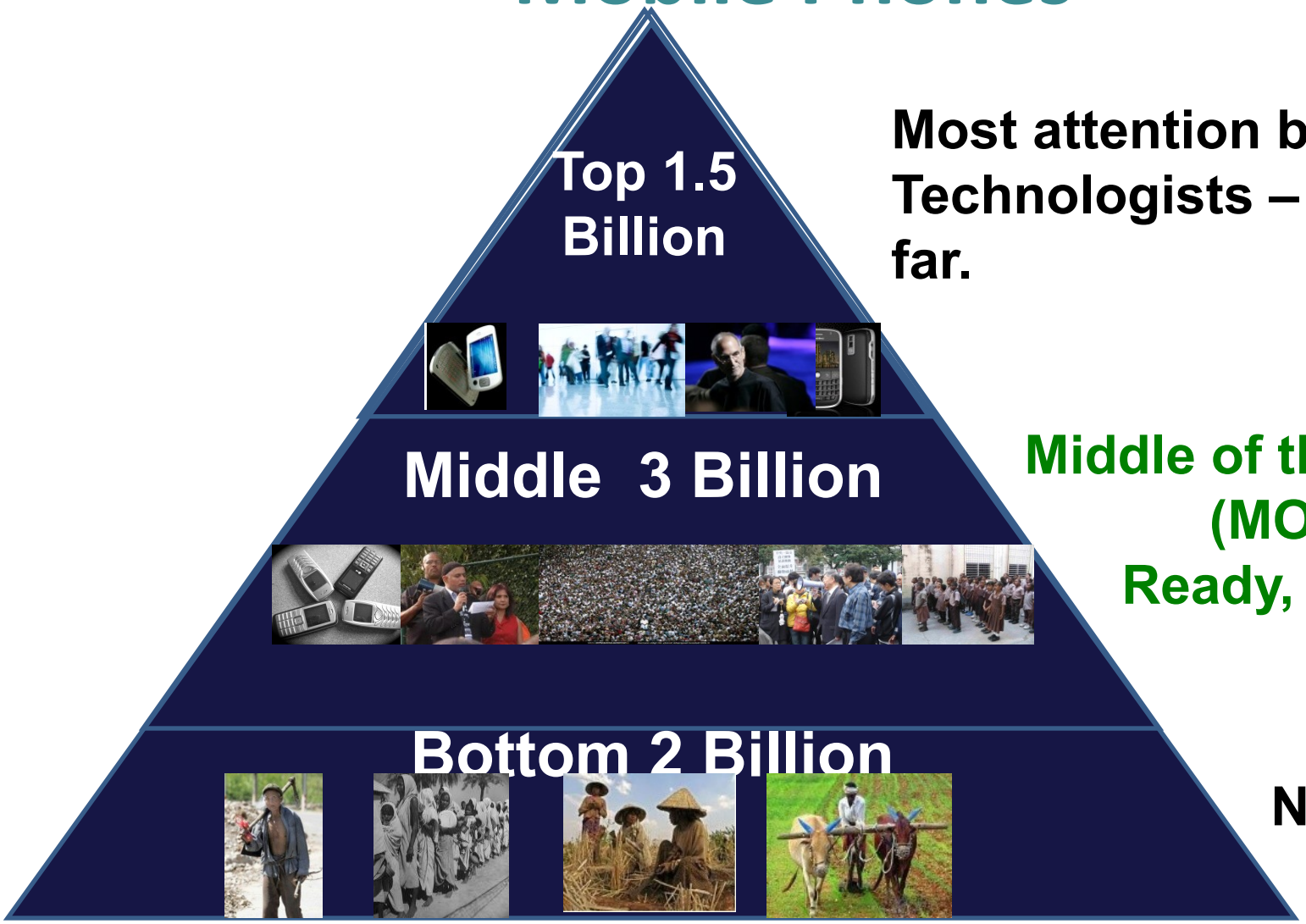


Connecting People

From Micro Events to Situations

From Tweets to Revolutions

The World as seen through Mobile Phones

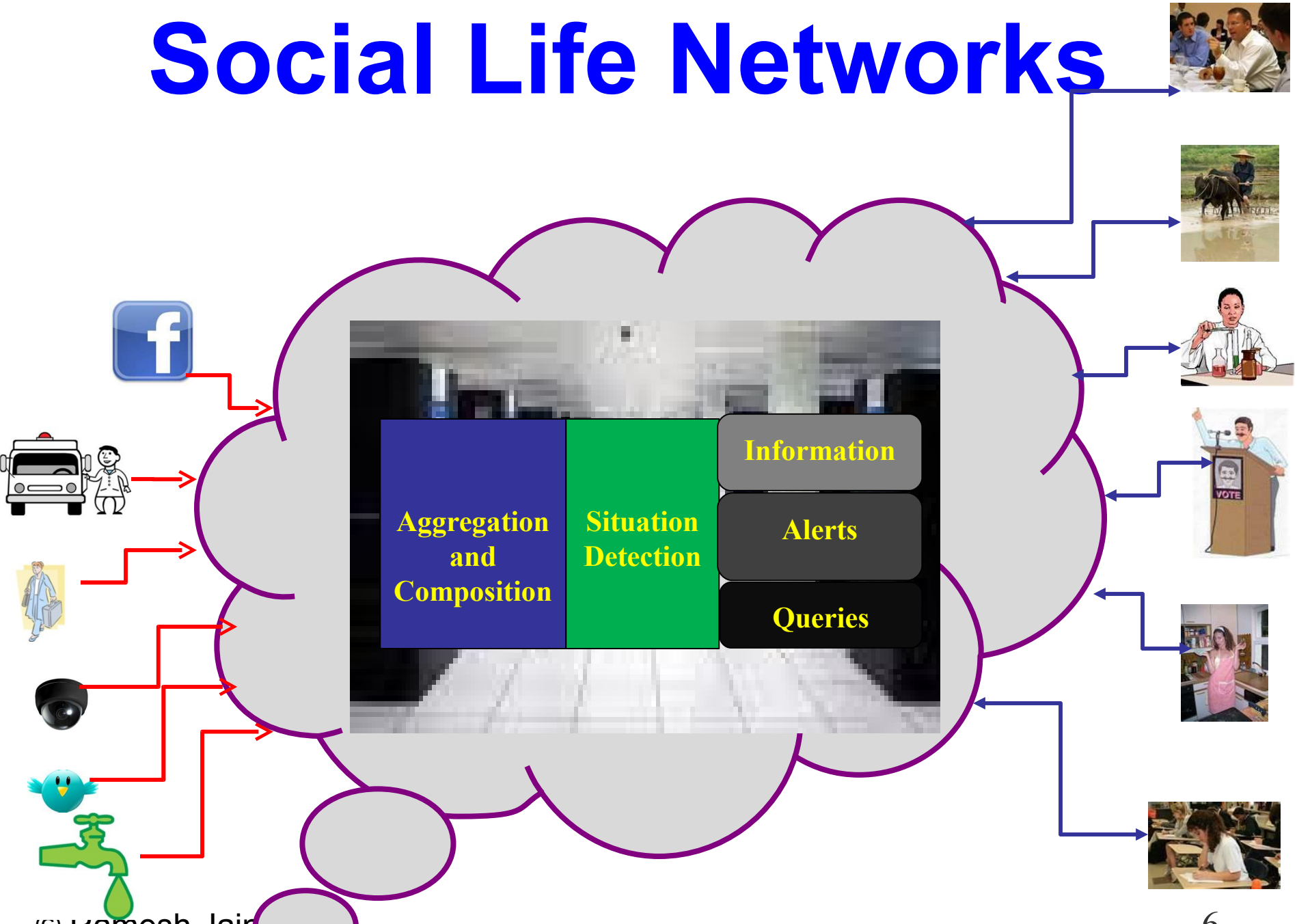


Most attention by Technologists – so far.

Middle of the Pyramid (MOP): Ready, BUT …

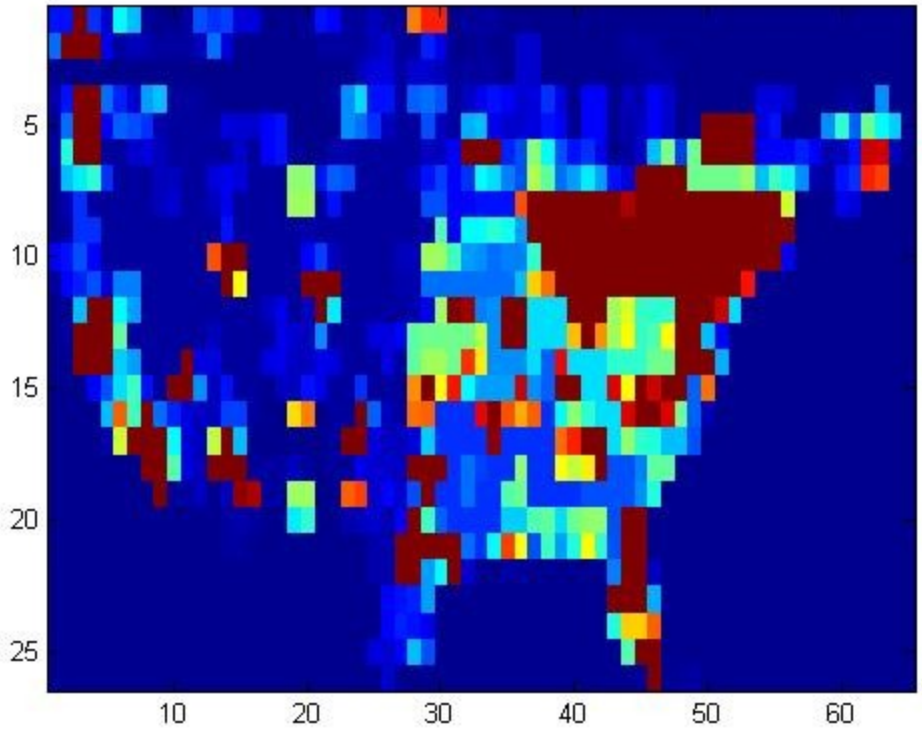
Not Ready

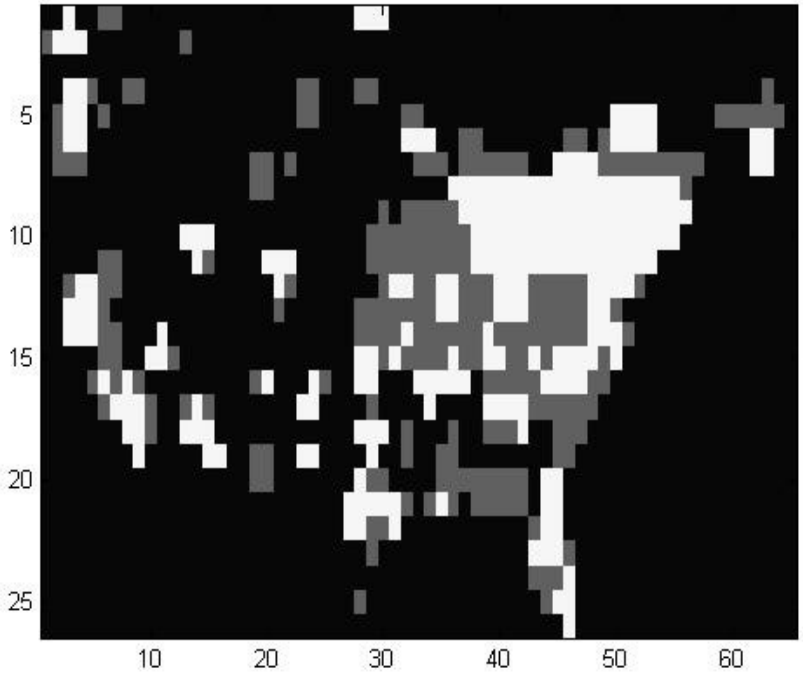
Social Life Networks



Swine flu social image and its segmentation

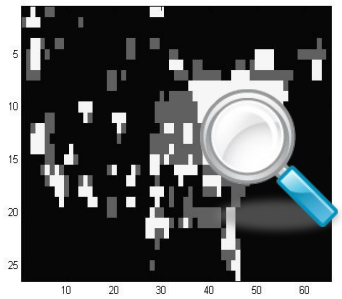
into ‘high’ and ‘low ’activity zones.





Situational Recommendation System

Macro situation



Date=12/09/10

Alert Level=High

Micro event

e.g. "Arrgggh, I have a sore throat"

(Loc=New York, Date=12/09/10)

Situational controller

·Goal

·Macro Situation

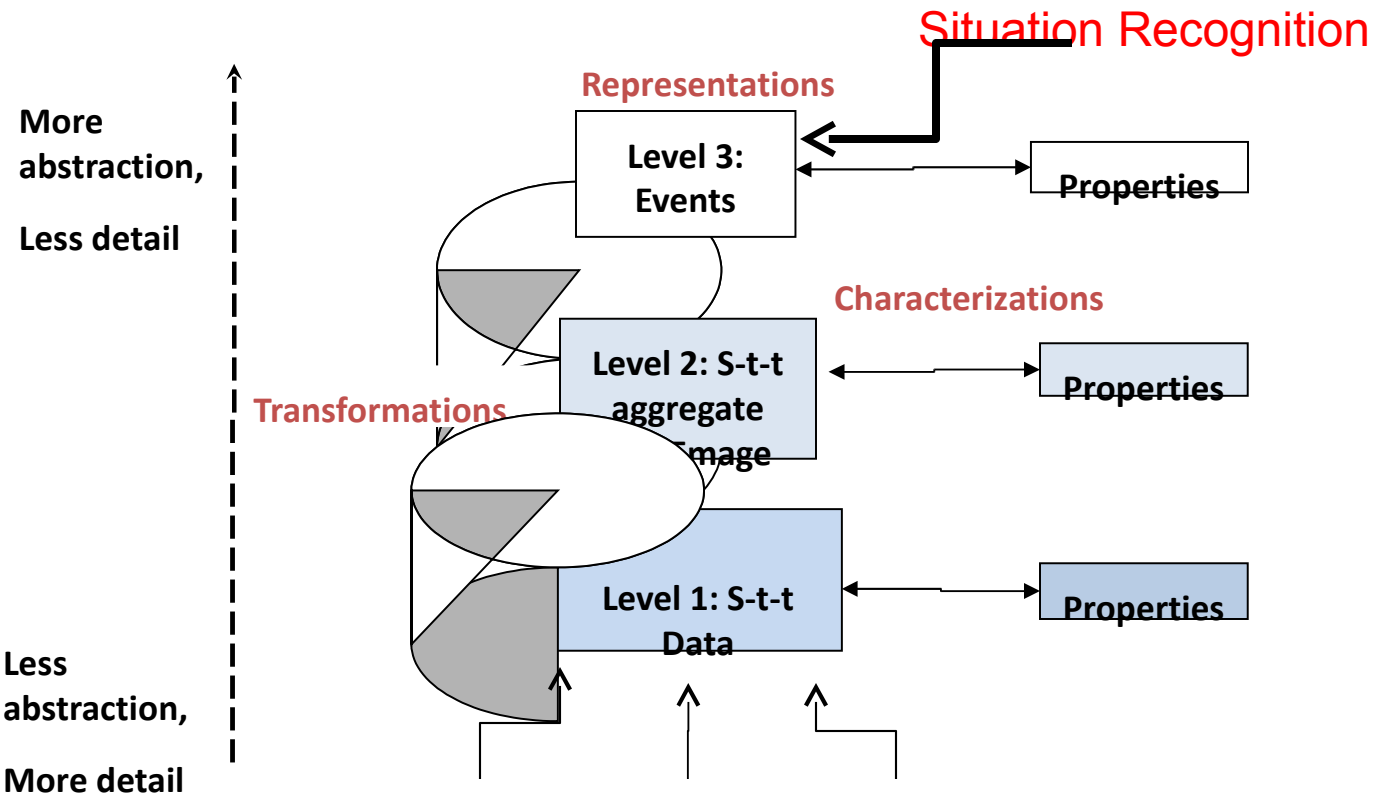
·Rules

Control Action

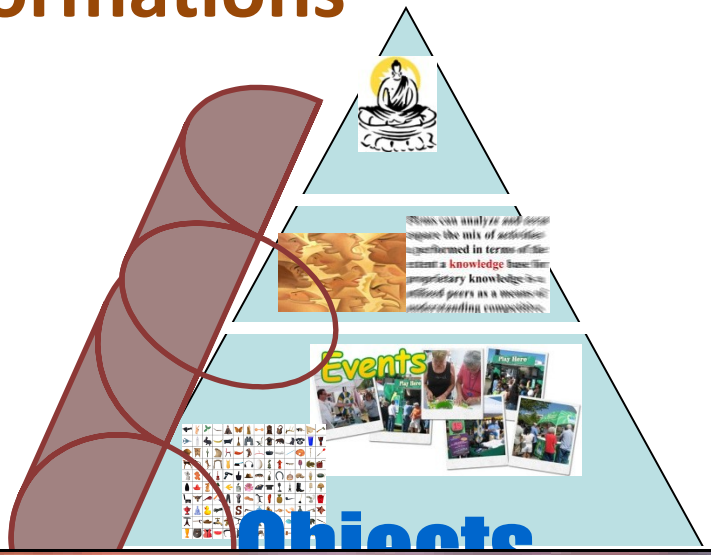
"Please visit nearest CDC center at 4th St immediately"

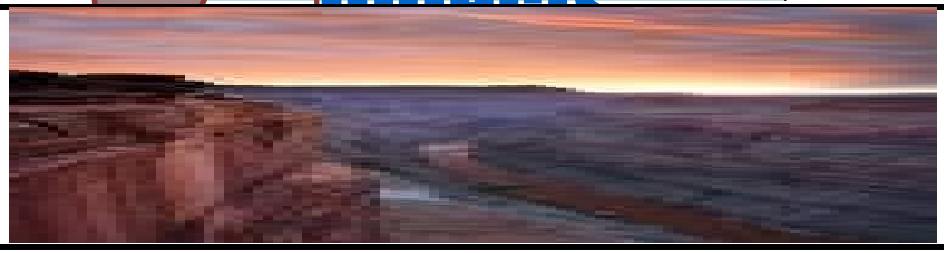
Level 1 personal threat + Level 3 Macro threat -> Immediate action

Real Time Situation Analysis



Transformations





Semantic Gap

Lists, Arrays, Documents, Images …

Alphanumeric Characters

Bits and Bytes

Semantic Gap

The semantic gap is the lack of coincidence between the information that one can extract from the visual data and the interpretation that the same data have for a user in a given situation. A linguistic description is almost always contextual, whereas an image may live by itself.

Content-Based Image Retrieval at the End of the Early Years
Found in: IEEE Transactions on Pattern Analysis and Machine Intelligence
Arnold Smeulders , et. al., December 2000

Models bridge the Semantic Gap.

Models

- A model in science is a physical, mathematical, or logical representation of a system of entities, phenomena, or processes. Basically a model is a simplified abstract view of the complex reality.

- Models in software allow scientists to leverage computational power to simulate, visualize, manipulate and gain intuition about the entity, phenomenon or process being represented

Ontology

An **ontology** is a formal representation of knowledge as a set of concepts within a domain, and the relationships between those concepts. It is used to reason about the entities within that domain, and may be used to describe the domain.

From http://en.wikipedia.org/wiki/Ontology_(informatio

Descriptions

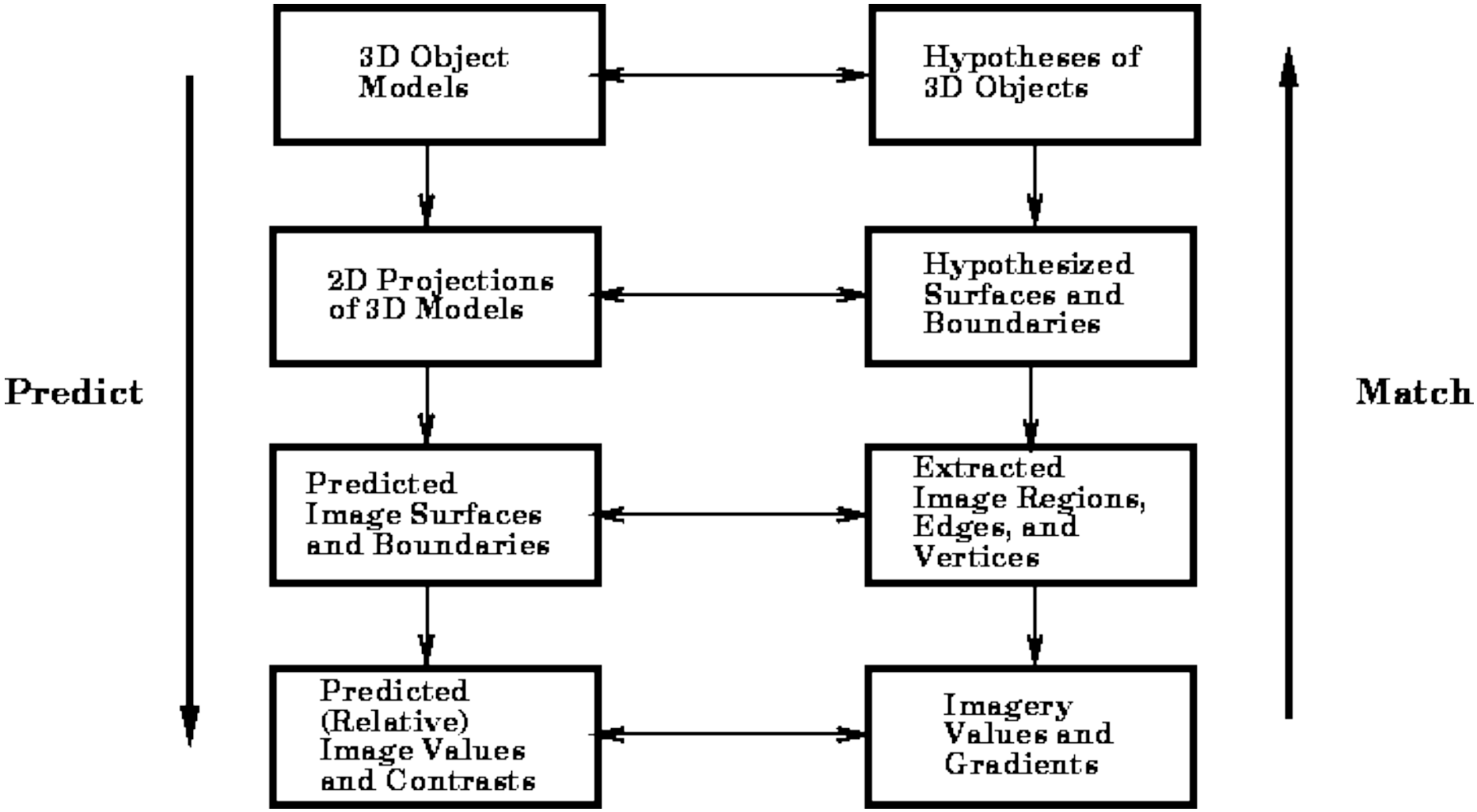
The purpose of description is to re-create, invent, or visually present a person, place, event, or action so that the reader may picture that which is being described.

Ontologies have been used mostly for description of domain knowledge.

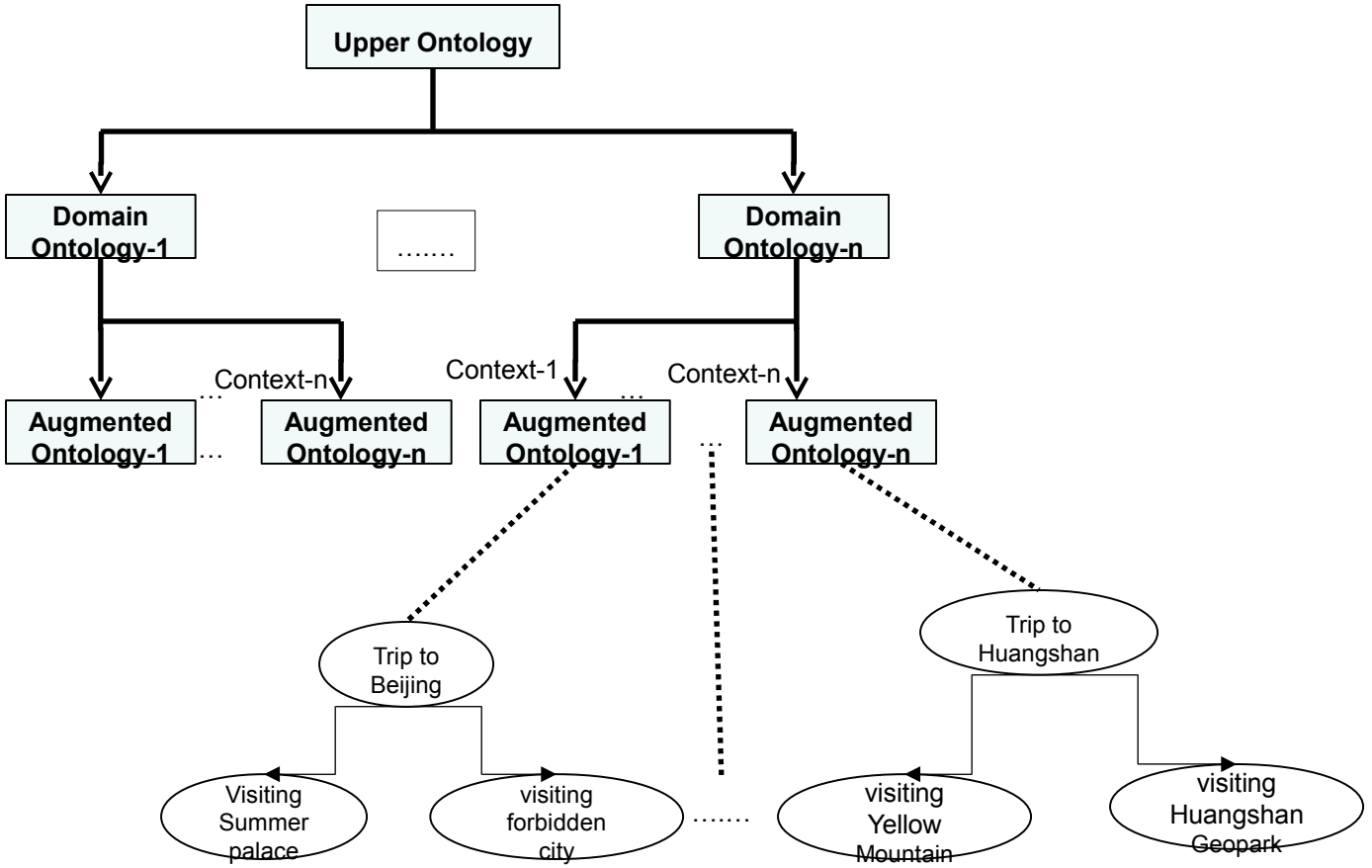
Recognition

Recognition is identification of something already known

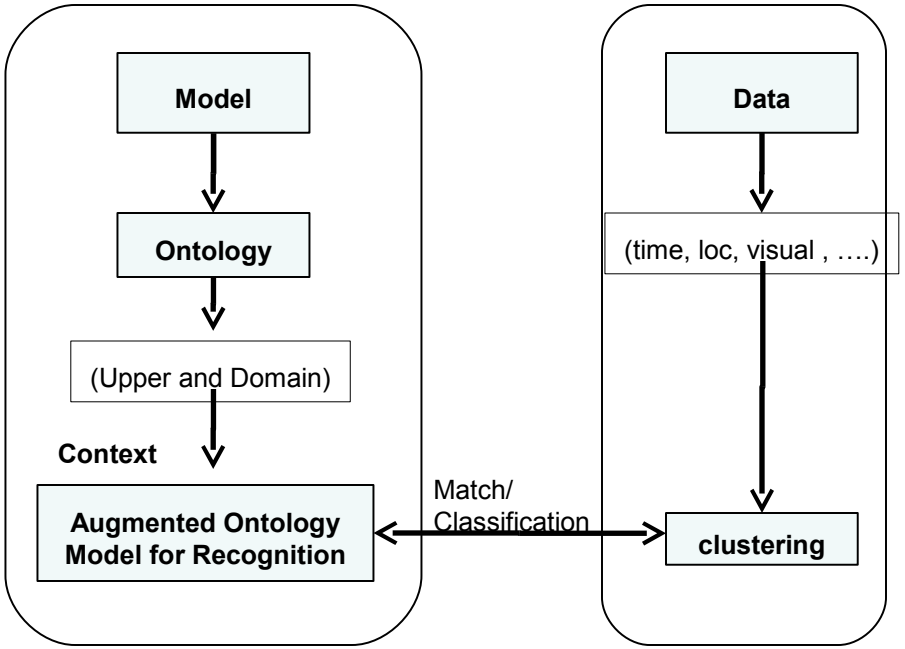
Thomas O. Binford. Image understanding: intelligent systems.
In *Image Understanding Workshop Proceedings*,
volume 1, pages 18-31, Los Altos, California, February 1987.



Creating R-Ontology



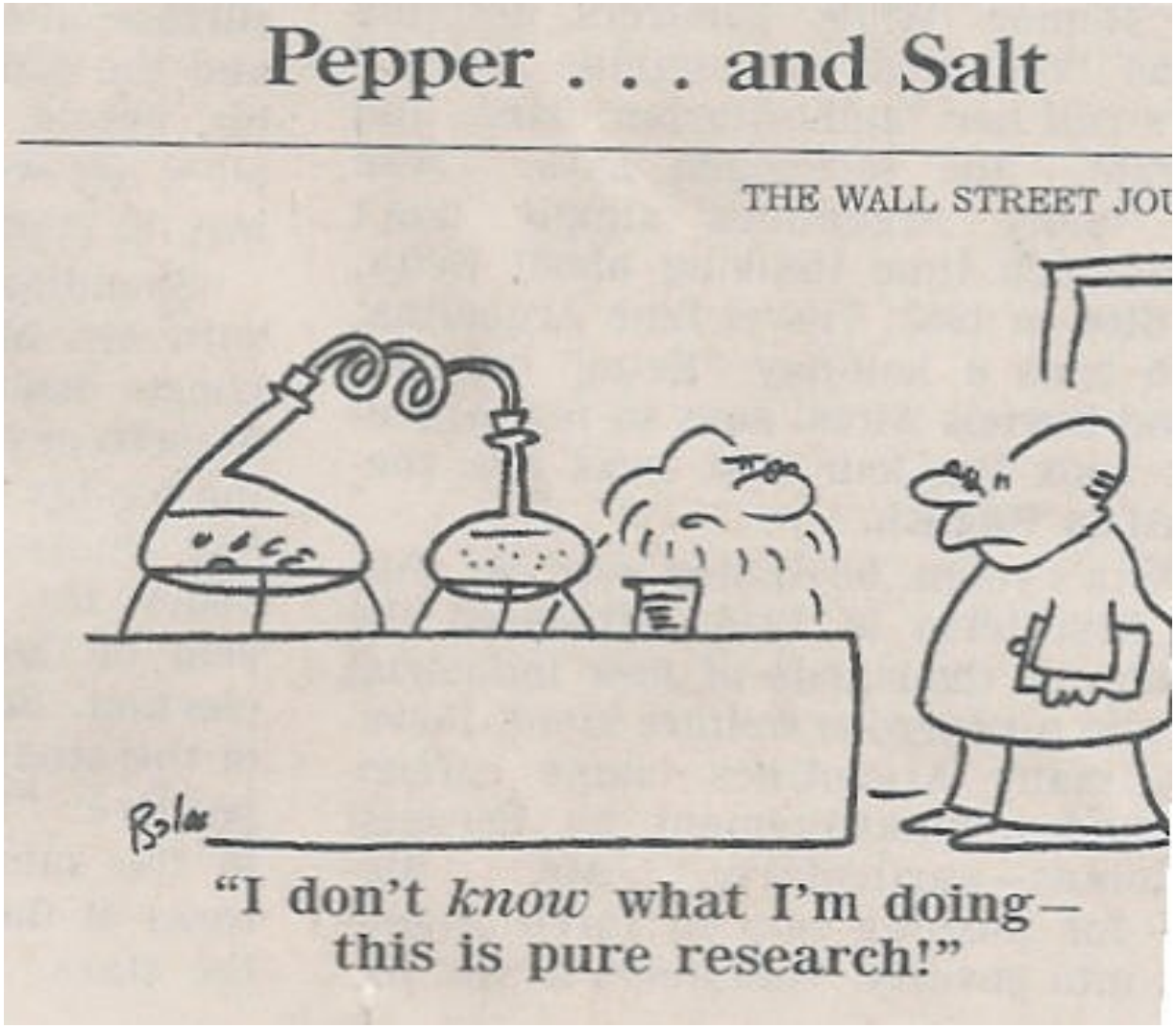
Recognition using R-Ontology



Conclusion

- Ontology for a specific situation augmented with available contextual information.
- Augmented Ontology used for recognition of situation from multiple sources of data.
- Ontology allow explicit specification of models that could be modified using context information to provide very flexible models to bridge the semantic gap.

Thanks for your time and attention.



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