

Knowledge Graphs

Lecture 1 – Knowledge Representation with Graphs

1.3 The Art of Understanding

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Lecture 1: Knowledge Representation with Graphs

1.1 From Data to Knowledge

1.2 Knowledge and how to represent it

1.3 The Art of Understanding

1.4 Graphs and Triples

1.5 Knowledge Graphs

1.6 The Semantic Web

1.7 Linked Data and the Web of Data

What is Meaning?

- *(In the philosophy of language, metaphysics, and metasemantics,)*
- **Meaning** is a relationship between two sorts of things:
 - **Signs** and
 - the kinds of things they **intend**, **express**, or **signify**.
- **Words** (and nonverbal symbols) are **necessarily meaningful**!



What does it mean to understand?

- **Understanding** (in general) is the ability to grasp the meaning of information.
- **Information** is conveyed in a **message** using a specific **language** from a sender to a receiver.
- **Information is understood** by the receiver of a message, if the receiver **interprets** the information **correctly**.

Meaning and Understanding

Correct Interpretation depends on

- Syntax,
- Semantics,
- Context,
- Pragmatics, and
- Experience.

Syntax

- =[greek] Arrangement, Ordering
- In **grammatics**, syntax denotes the study of the **principles** and processes **by which sentences are constructed** in particular languages.
- In **formal languages**, syntax is just a set of rules, by which well formed expressions can be created from a fundamental set of symbols (alphabet).
- In **computer science**, syntax defines the normative structure of data.

X This sentence no verb.

✓ This sentence has no verb.

Semantics

- =[greek] pertains to the character, the study of meaning
- is part of linguistics which focuses on **Sense and Meaning** of language or symbols of language.
- is the **study of interpretation of signs or symbols** as used by agents or communities within particular circumstances and **contexts**.
- Semantics asks, how sense and meaning of complex concepts can be derived from simple concepts based on the **rules of syntax**.
- The semantics of a message depends on **context** and **pragmatics**.

X This sentence has no verb.

✓ This sentence has a verb.

Context

- [lat.] contextus = interweaved
- denotes the **surrounding of a symbol** (concept) in an expression with respect to its **relationship with surrounding expressions** (concepts) and further related elements.
- Context denotes **all elements of any sort of communication that define the interpretation of the communicated content.**

The jaguar looks rather elegant.



Pragmatics

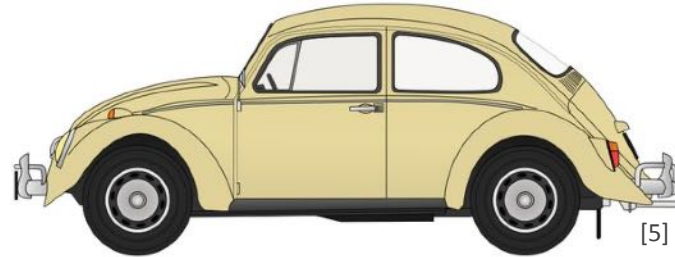
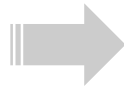
- =[greek] action
- reflects the **intention by which the language is used** to communicate a message.
- In linguistics, pragmatics denotes the **study of applying language in different situations**.
- It also **denotes the intended purpose** of the speaker.
- Pragmatics studies **the ways in which context contributes to meaning**.

"Is there any beer left in the fridge?"
(= "Could you please go to the fridge and get me some beer?")

Experience

- **Experience** considers all knowledge that you have learned and put in context with the world you are living in.
- Experience in this sense is often referred to as **common sense knowledge** or **world knowledge**.

"Think small!"



[5]

Successful Communication

- For **successful communication**,
 - information has to be correctly transmitted (**Syntax**)
 - the meaning (**Semantics**) of the transmitted information must be interpreted correctly (= **understanding**).
- **Understanding** depends on
 - the **context** of both sender and receiver and
 - the **pragmatics** of the sender.
- (Personal) **experience** determines
how sender and receiver **interpret the semantics, context, and pragmatics** of a message, and thus its intended meaning.



Graphs and Triples

Next Lecture...

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