

Media Transformation

Vorlesung

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Woche 4



Computer generated stories: How?

- What people want to communicate
 - thus human agenda driven
 - *answering* questions
 - Eliza using external data sets
- Analyse data
 - “mining data for meaning and insight”
- Deliver analysis in natural language



Natural language generation

- Translating
 - *from* computer based representations
 - *into* natural language representations
- Either explicit models (grammars)...
- ...or statistical models of human text
 - as in NLP in general



Natural language generation

1. Content determination
2. Document structuring
3. Aggregation
4. Lexical choice
5. Referring expression generation
6. Realisation

Further reading (example): Dale, Robert; Reiter, Ehud (2000). *Building natural language generation systems*. Cambridge.



Natural language generation

1. Content determination
 - Deciding what information to mention in the text.
 - For instance, deciding whether to explicitly mention that pollen level is 7 in the south east.
2. Document structuring
3. Aggregation
4. Lexical choice
5. Referring expression generation
6. Realisation



Natural language generation

1. Content determination
2. Document structuring
 - Overall organisation of the information to convey.
 - For example, deciding to describe the areas with high pollen levels first, instead of the areas with low pollen levels.
3. Aggregation
4. Lexical choice
5. Referring expression generation
6. Realisation



Natural language generation

1. Content determination
2. Document structuring
3. Aggregation
 - Merging of similar sentences to improve readability and naturalness.
 - For instance, merging the two sentences "Grass pollen levels for Friday have increased from the moderate to high levels of yesterday" and "Grass pollen levels will be around 6 to 7 across most parts of the country" into the single sentence "Grass pollen levels for Friday have increased from the moderate to high levels of yesterday with values of around 6 to 7 across most parts of the country".
4. Lexical choice
5. Referring expression generation
6. Realisation



Natural language generation

1. Content determination
2. Document structuring
3. Aggregation
4. Lexical choice
 - Putting words to the concepts.
 - For example, deciding whether medium or moderate should be used when describing a pollen level of 4.
5. Referring expression generation
6. Realisation



Natural language generation

1. Content determination
2. Document structuring
3. Aggregation
4. Lexical choice
5. Referring expression generation
 - Creating referring expressions that identify objects and regions.
 - For example, deciding to use in the Northern Isles and far northeast of mainland Scotland to refer to a certain region in Scotland.
 - This task also includes making decisions about pronouns and other types of anaphora.
6. Realisation



Natural language generation

1. Content determination
2. Document structuring
3. Aggregation
4. Lexical choice
5. Referring expression generation
6. Realisation
 - Creating the actual text, which should be correct according to the rules of syntax, morphology, and orthography.
 - For example, using will be for the future tense of to be.



Content generation systems

Example:

Galitsky, Boris (2013). "A Web Mining Tool for Assistance with Creative Writing". *Advances in Information Retrieval. Lecture Notes in Computer Science*. 7814: 828–831.

doi:10.1007/978-3-642-36973-5_95.

- What do they say?
- Do you accept their argument?



Publish or perish

- Need more text produces
- Less time to produce it
- Solution
 - domain-independent creative writing tool
 - when quality is not essential
 - based on large content collections
- Machine learning
 - topic analysis of content



Creative writing assistance

- Domain dependent template
 - built automatically
 - event description, biography, political news, ...
 - can include dialogue/argumentative structure
- Epistemic structure
 - extracted from texts in domain



Creative writing

- Search the web
 - tool
- Find pieces
 - tool
- Merge them
 - tool, human do final acceptance/rejection
- Final text polishing
 - human



The process

- For any idea
 - a similar document exists
- Cannot really invent something new
 - find that document
 - substitute
- Starting point
 - seed sentences
 - basis for construction of search



Questions

- Who will read all this text?
 - computers?
 - algorithms analysing it to make new texts
- What is it to tell a story
 - to express oneself?
 - to produce a number of words?



So what is this really?

- Analysis of data...
- ...presented not as a graph...
- ...but as a text
- Stories as a visualisation tool
 - from image to text—as–visualisation
 - (impression of) objectivity?
- So who is the winner?
- Poetry or painting?
 - that is, the visual or the graphical?



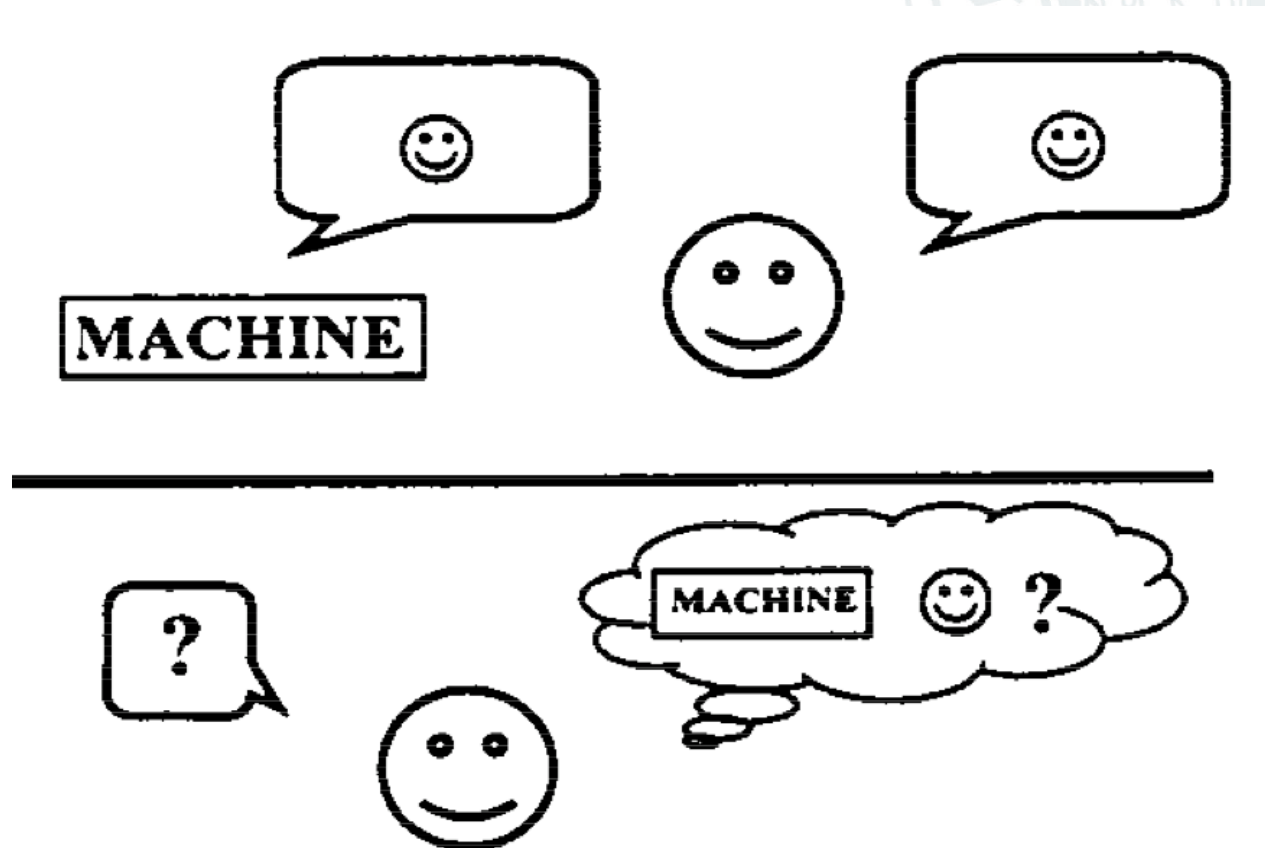
Interactivity

- The quality or condition of interaction
- Can be higher or lower
- Human to human interactivity
 - communication between people
- Human to computer interactivity
 - the artefact does not desire communication
 - interactive behaviour experienced by human



The Turing test

- Alan Turing, 1950
- Testing the machine's ability to show intelligence



Saygin, A. P.; Cicekli, I.; Akman, V. (2000), "Turing Test: 50 Years Later" (PDF), *Minds and Machines*, 10 (4): 463–518

Dialogism

- Dialogue between people talking
- Dialogue with historical sources
- Dialogue with natural environment
- Text and text interpreter
- Bakhtin: literary texts are dialogical
 - intertextuality
- Forming thoughts through dialogue
 - learn what we know by saying it



Affordances

- Based on the verb “to afford” (Gibson)
- Complementarity animal—environment
- Relative to the animal
 - surface of the lake for a flea and for a dog
- Intention irrelevant
 - a tree is shelter against the rain
 - this is not the purpose or intention of the tree



In dialogue with our surroundings

- Using affordances
 - natural
 - language: potentials in concrete utterances (Linell)
- The language is part of the dialogue
- Context of interaction
- Interaction at many levels
 - with each others
 - with tools
 - with landscape...



Interhuman communication

- Talking to each others
- Happens in context
- Significant shared background
 - common affordances
- Face to face
 - sound, sight, smell, touch, ...
- Mediated
 - narrower in varying degree



Intercultural communication

- Less common affordances
 - language differences
 - cultural differences
- Emotional differences
 - culture and the individual
- Common languages
 - football
 - laughter
 - rituals
- Communication always possible
 - but can be hard



Interspecies communication

- Human to animal
- Animal to animal
- Animal to plant
- Less symbolic
 - words play a different role
- Intentionality unclear
 - does the dog want to interact with me?
 - the tree?



Communication with the dead

- Religion/mythology
- Literature
 - “Sapho speaks to me”
 - (but do I reply?)
 - model reader → author instance in text
- Talking to fictional persons
- Art
 - falling in love with a painting – or the motive?
- Virtual reality
 - talking to historical persons?

