Impulse for the panel “Die Hyperpersonalisierung des Lernenden: Analysemacht von AI, Auswirkungen auf das Lehrumfeld und die Rolle der Lehrkraft”

Dr. Aljoscha Burchardt

German Research Center for Artificial Intelligence

Goethe-Institut Peking / Institut français
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Man vs. Machine

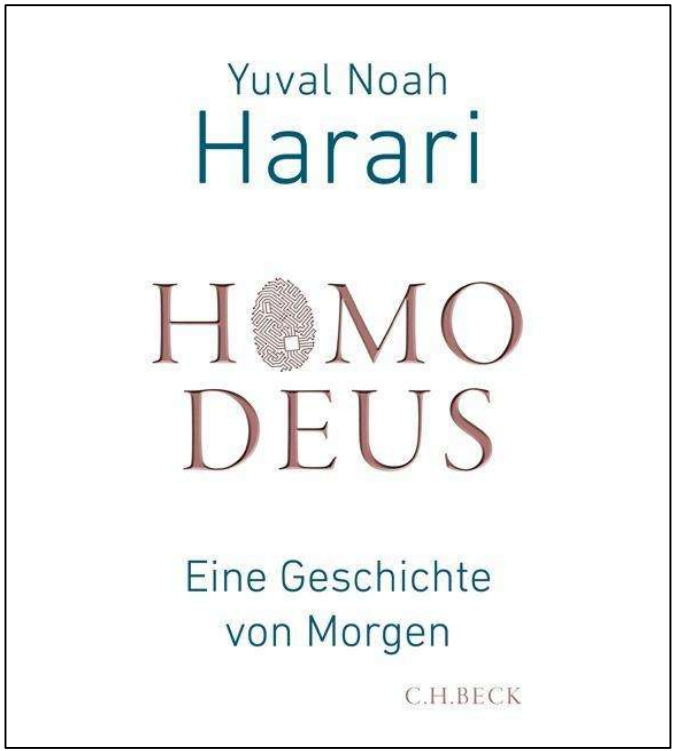
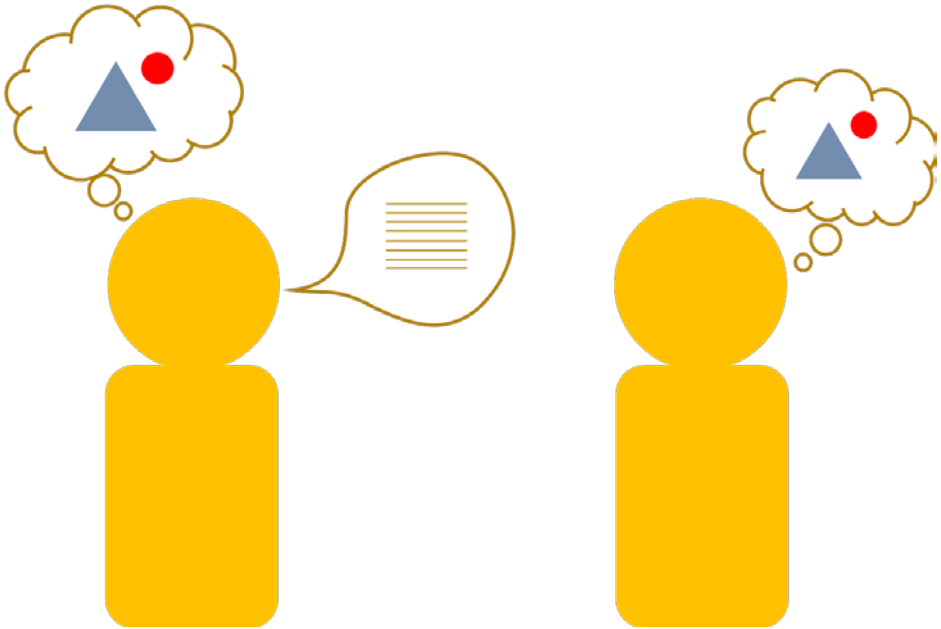


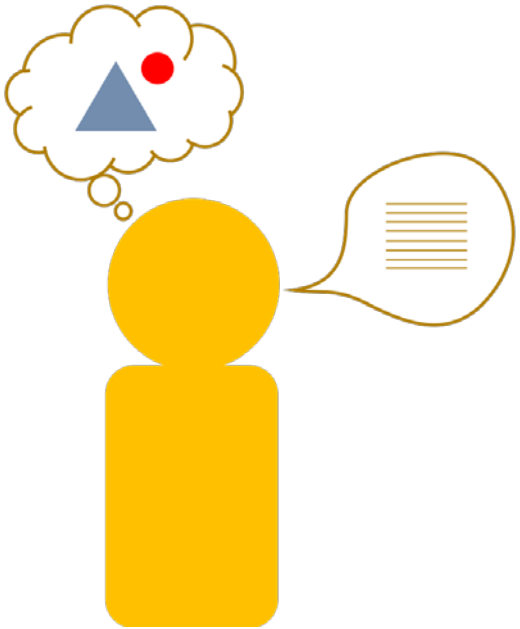
Bild: www.jpc.de

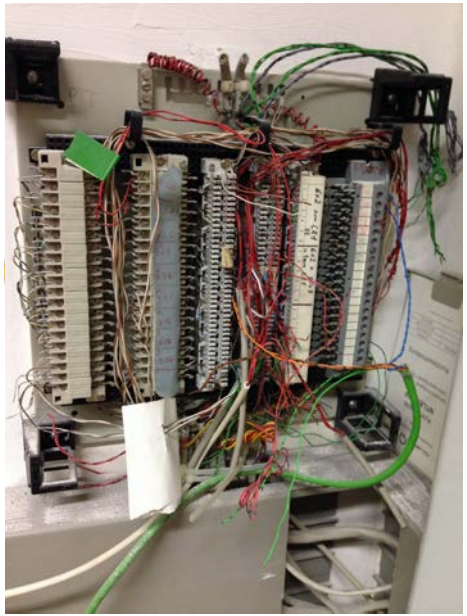
- A human is a highly complex biochemical algorithm
- There is no fundamental difference
  - spirit
  - soul
  - indviduum

Language as human-human interface



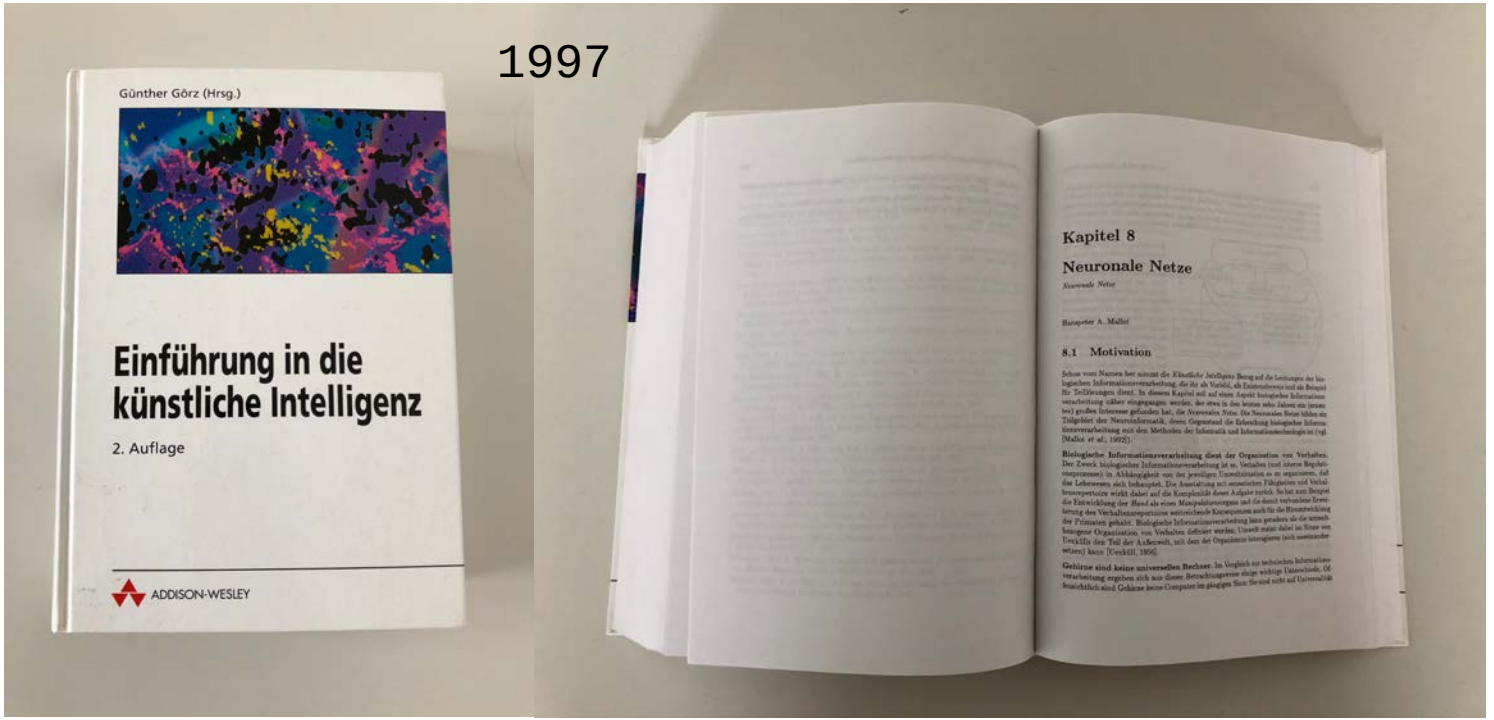
Language as human-machine interface





Maschine Translation

The historical dimension



History of MT

- „Shifting words“
- Rule-based MT
- Translation Memories
- Classical Machine Learning
- Today‘s Machine Learning

History of AI

- Algorithmics
- Expert systems
- Heuristic Algorithms
- Features / Statistics
- Neural Networks

ARE THE SYSTEMS BLACK BOXES?

Test suite experiment – systems used

O-PBMT	Old (phrase-based) version of Google Translate (**o**nline, February 2016)
O-NMT	New (neural) version of Google Translate (**o**nline, November 2016)
OS-PBMT	Open-source phrase-based system (Moses) that uses a default configuration to serve as a baseline (only De-En)
DFKI-NMT	Barebone neural system from DFKI, based on an encoder-decoder neural architecture with attention
ED-NMT	Neural system from U Edinburgh, system was built using the Nematus toolkit
RWTH-NMT	NMT-system from RWTH, makes use of subword units and has been finetuned to perform well on the IWSLT 2016 spoken language task (only De-En)
RBMT	Commercial rule-based system Lucy

Test suite experiment – examples: ambiguity

(1)	Source:	Er hat einen Kater, weil er sehr tierlieb ist.
	Reference:	He has a cat because he is very fond of animals.
	Google-old:	He has a hangover, because he is very fond of animals.
	Google-new:	He has a cat because he is very fond of animals.
	RBMT:	He has a tomcat because it is very animal-dear.
	OS-PBMT:	He has a hangover because it is an encounter.
	DFKI-NMT:	He has a kater because he is very animal.
	RWTH-NMT:	He has a hangover because he‘s very animal.
	ED-NMT:	He has a hangover because he is very animal-loving.

Test suite experiment – examples: phrasal verb

(2)	Source:	Warum hörte Herr Muschler mit dem Streichen auf?
	Reference:	Why did Mr. Muschler stop painting?
	Google-old:	Why heard Mr. Muschler on with the strike?
	Google-new:	Why did Mr. Muschler stop the strike?
	Update 2020:	Why did Mr. Muschler stop painting?
	RBMT:	Why did Mr. Muschler stop with the strike?
	OS-PBMT:	Why was Mr Muschler by scrapping on?
	DFKI-NMT:	Why did Mr. Muschler listen to the rich?
	RWTH-NMT:	Why did Mr. Muschler listen to the stroke?
	ED-NMT:	Why did Mr. Muschler stop with the stump?

Test suite experiment – examples: MWE

(7)

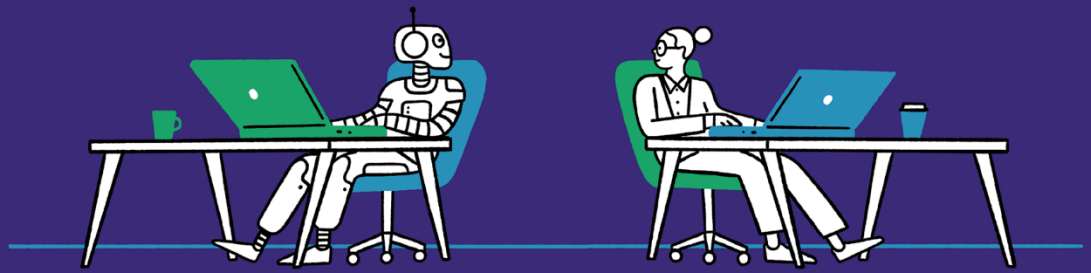
Source:	Die Arbeiter müssten in den sauren Apfel beißen.
Reference:	The workers would have to bite the bullet.
Google-old:	The workers would have to bite the bullet.
Google-new:	The workers would have to bite into the acid apple.
Update 2020:	The workers would have to bite the bullet.
RBMT:	The workers would have to bite in the acid apple.
OS-PBMT:	The workers would have to bite the bullet.
DFKI-NMT:	Workers would have to bite in the acid apple.
RWTH-NMT:	The workers would have to bite into the clean apple.
ED-NMT:	The workers would have to bite in the acidic apple.

By way of an intermediate summary

Machines read on the lines, humans read between the lines.

AI Campus

The Learning Platform
for Artificial Intelligence



AI Campus – the Learning Platform for Artificial Intelligence

https://ki-campus.org

May 2020

Language Learning with Natural Language Processing (few selected examples)

What systems can do

- Find/create personalized learning material/experience
  - Domain texts / linguistic phenomena
  - MC tests
  - QA (Chat)
- Recommend learning units
- Learning analytics
- …

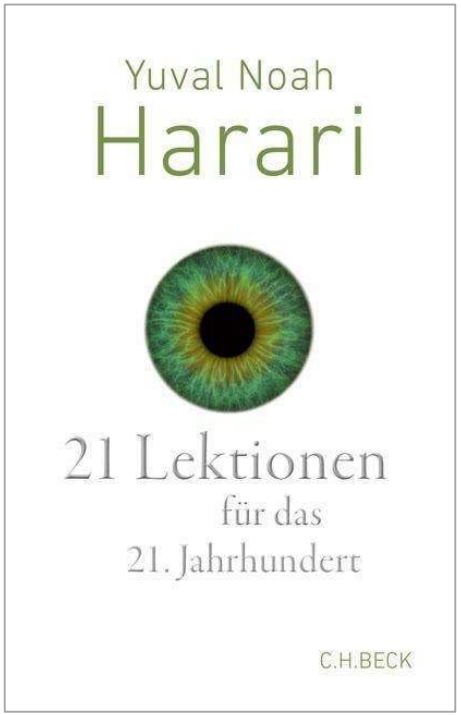
What systems cannot do well

- Give qualified feedback to learner's performance (errors)
- Answer learner's questions
- …

Algorithms will repeatedly make mistakes due to insufficient data, faulty programming, muddled goal definitions and the chaotic nature of life.

[…] most people often make terrible mistakes in the most important decisions of their lives.

Even more than algorithms, humans suffer from insufficient data, from faulty programming (genetic and cultural), from muddled definitions, and from the chaos of life.



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