



University of St.Gallen

Institute of Computer Science

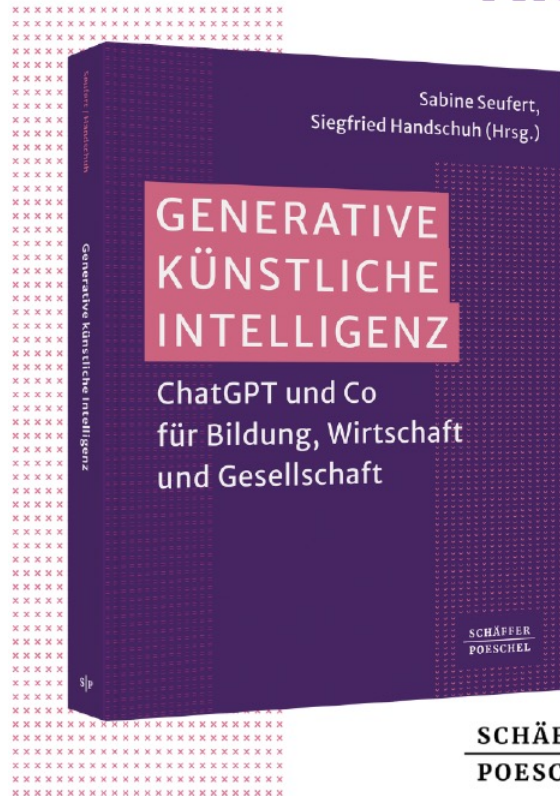
Turn of an Era: Generative AI - a step towards Artificial general Intelligence?

Prof. Dr. Siegfried Handschuh
Münchenwiler, 19. April 2024



From insight to impact.

Chancen und Risiken von KI



- Funktionsweisen, Stärken und Schwächen
- Bildung, Wirtschaft und Gesellschaft

**SCHÄFFER
POESCHEL**

Write a song in the style of Taylor Swift on the occasion of the Seminar

Verse:

Schloss Münchenwiler, where great minds ignite,
Researchers converge, in pursuit of insight.
AI and science, shaping what's to come,
Collegium generale, where all ideas are welcome

Verse: C F G Am

Chorus :

It's a new era, a brave new world
AI's potential, waiting to be unfurled
From medicine to peer review
The possibilities, they break through
At the AI and Science Seminar

Chorus: C G Am F

WHAT IS AN LLM?



VECTOR SPACE MODEL

LARGE LANGUAGE MODELS (LLM) GPT, GENERATIVE AI SIEGFRIED HANDSCHUH

CHALLENGES

LLM'S = FANTASTIC

BUT ...

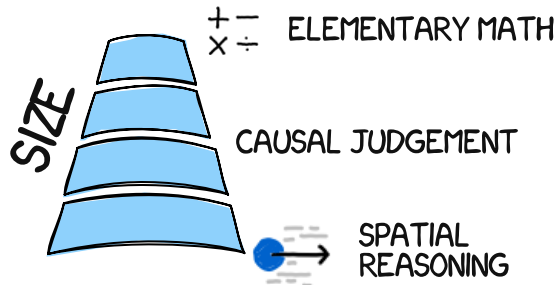
- THEY HALLUCINATE
- ARE EXPENSIVE
- NO CONNECTED KNOWLEDGE, CONTRADICTIONS ARE POSSIBLE

TRAINED ON A LOT OF TEXT



EMERGENT ABILITIES

355 YEARS!



FUTURE OF LLM'S?

NEXT-WORD PREDICTION



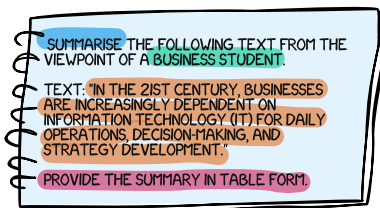
BERN IS THE ... ?



CAPITAL (6%)
BEST (5%)
FIRST (3%)
ONLY (3%)

PROMPT-ENGINEERING

INSTRUCTION
CONTEXT
INPUT DATA
OUTPUT INDICATOR



LLAMA, ALPACA, VICUNA

MODEL "SHRINKING"

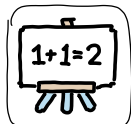


MIT NEWS
"HOW THE BRAIN PROCESSES LANGUAGE"

Emergent Abilities

S

GPT-3 13B
PaLM 8B



simple Arithmetic



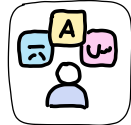
Debugging



Reading Comprehension

M

GPT-3 175B
LaMDA 137B
PaLM 64B
Chinchilla 7B



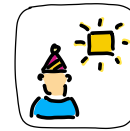
Linguistic Puzzles



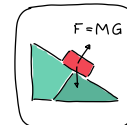
Emoji Movie



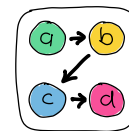
GRE-Comprehension



Metaphor Understanding



Physical Intuition



Logical Deduction

L

PaLM 540B
Chinchilla 70B



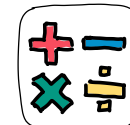
Geometric Shapes



Proverbs



Phonetic Alphabet



Elementary Math



Causal Judgement



Codeline Description

XL

GPT-4
Gemini



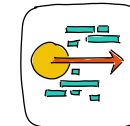
College-Level Exams



Self-Critique/Reflection



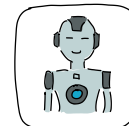
App-Building



Spatial Reasoning



Advanced Creativity



Embodiment Options

Next...



...



Long-Horizon Planning



Persuasion



Advanced Embodiment



Awareness

(inspired by: Thomason 2023)

Simulacra: Simulations with Large Language Models



How does it work?

Record

Record Experiences: The agent records its experiences and interactions with the environment.

Synthesize

Synthesize Memories: It synthesizes memories based on past interactions, which influence its behavior.

Plan

Plan Behavior: The agent plans its future actions based on its memories and the current context.

Memory Stream

2023-02-13 22:48:20: desk is idle
2023-02-13 22:48:20: bed is idle
2023-02-13 22:48:10: closet is idle
2023-02-13 22:48:10: refrigerator is idle
2023-02-13 22:48:10: Isabella Rodriguez is stretching
2023-02-13 22:33:30: shelf is idle
2023-02-13 22:33:30: desk is neat and organized
2023-02-13 22:33:10: Isabella Rodriguez is writing in her journal
2023-02-13 22:18:10: desk is idle
2023-02-13 22:18:10: Isabella Rodriguez is taking a break
2023-02-13 21:49:00: bed is idle
2023-02-13 21:48:50: Isabella Rodriguez is cleaning up the kitchen
2023-02-13 21:48:50: refrigerator is idle
2023-02-13 21:48:50: bed is being used
2023-02-13 21:48:10: shelf is idle
2023-02-13 21:48:10: Isabella Rodriguez is watching a movie
2023-02-13 21:19:10: shelf is organized and tidy
2023-02-13 21:18:10: desk is idle
2023-02-13 21:18:10: Isabella Rodriguez is reading a book
2023-02-13 21:03:40: bed is idle
2023-02-13 21:03:30: refrigerator is idle
2023-02-13 21:03:30: desk is in use with a laptop and some papers on it
...

Q. What are you looking forward to the most right now?

Isabella Rodriguez is excited to be planning a Valentine's Day party at Hobbs Cafe on February 14th from 5pm and is eager to invite everyone to attend the party.

retrieval	=	recency	importance	relevance
2.34	=	0.91	+ 0.63	+ 0.80

ordering decorations for the party

2.21	=	0.87	+ 0.63	+ 0.71
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researching ideas for the party

2.20	=	0.85	+ 0.73	+ 0.62
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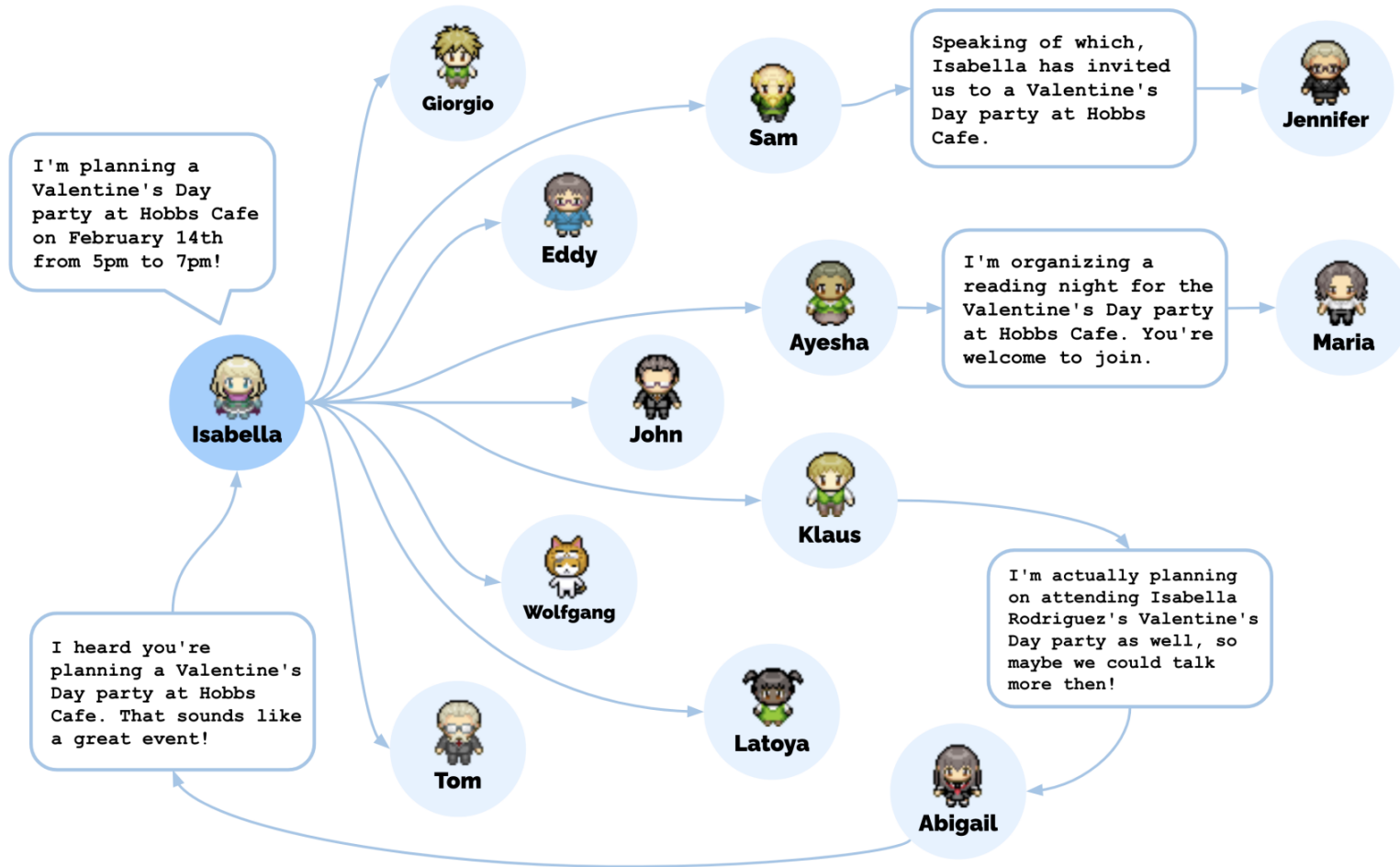
...



I'm looking forward to the Valentine's Day party that I'm planning at Hobbs Cafe!



Isabella



AI on the Board of Directors? A Hong Kong Company Made It Happen

- [AI on the Board of Directors?](#)
- [AI Granted Citizenship](#)
- [Mindy Support is Facilitating the Development of Next-Gener](#)

It seems that every year, we find new practical applications for AI. From developing self-driving cars, and helping farmers increase their crop yields, to very interesting new roles for AI and it brings up ethical and legal questions. We need to reexamine the role AI is playing in our society today as well as its expected future. Here are some interesting examples of AI taking on new roles and responsibilities.

BUSINESS

Artificial intelligence gets a seat in the boardroom

Hong Kong venture capitalist sees AI running Asian companies within 5 years



Can LLMs do better decision than humans?



ON THE SHOW SHOP WELLNESS PARENTS FOOD

● TODAY *all day*



HEALTH & WELLNESS

A boy saw 17 doctors over 3 years for chronic pain. ChatGPT found the diagnosis

Alex experienced pain that stopped him from playing with other children but doctors had no answers to why. His frustrated mom asked ChatGPT for help.

GPs cannot know everything, and specialists only deal with their respective specialties.

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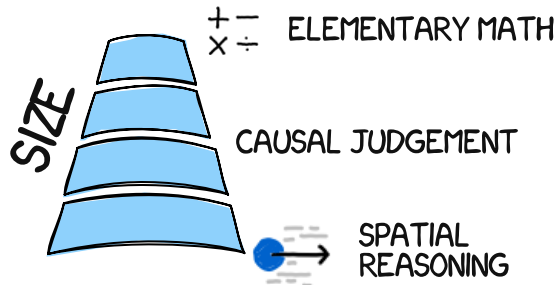
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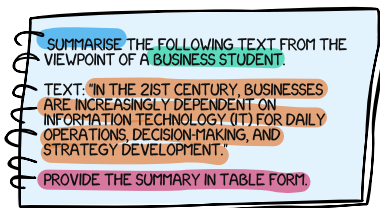
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Thank you

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- Bildung, Wirtschaft und Gesellschaft

SCHÄFFER
POESCHEL

Mehr Infos

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