

ti&m breakout session

ChatGPT – AI for business?



March 2023

ti&m

We digitalize your company.

600+



talents

Consultants, analysts, designers, system and software engineers.

No. 1



in Switzerland

for digitalization, security and innovation projects and products.

100%



vertical integration

of the entire IT value chain.

6



offices

Zurich, Bern, Basel, Frankfurt am Main, Dusseldorf and Singapore.

20%



growth per year

Our expertise in digital banking & finance, insurance, eGovernment and public sector, transport and logistics, life sciences and industry, retail and cyber defense makes us the right partner for you.

Top 10



of the largest owner-managed Swiss IT companies

Founded in 2005 and 100% owner-managed since then.

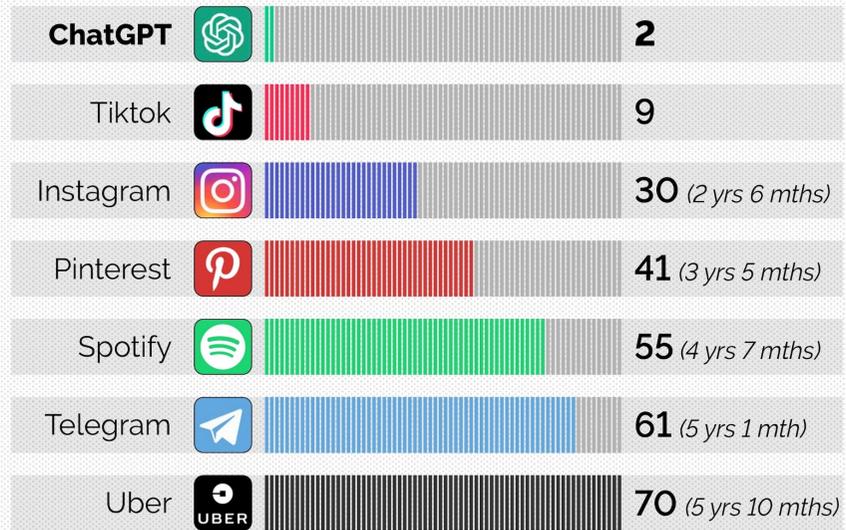
Why the Hype around ChatGPT?



ZOOMING AHEAD

Time to reach **100 million** monthly active users

No. of months



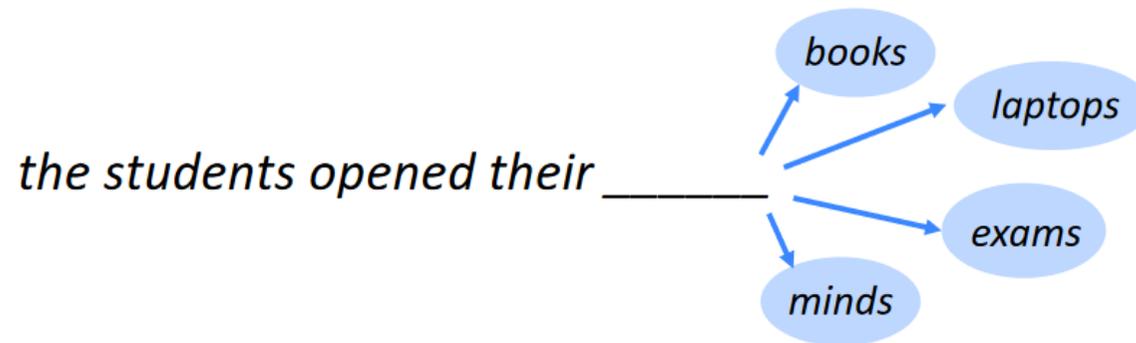
**For most of us, ChatGPT was "first contact"
with an Artificial Intelligence**

What is ChatGPT and how does it work?

What is ChatGPT?

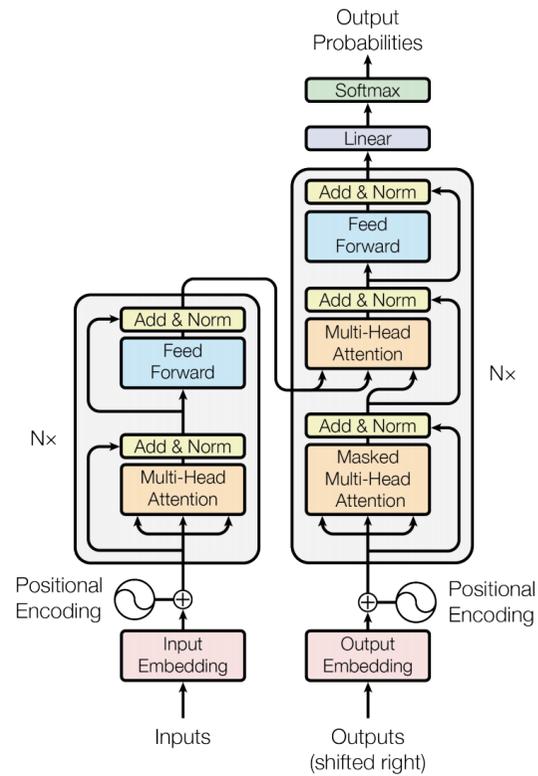
ChatGPT is first of all a Large Language Model (LLM)

Generative (Large) Language Models predict the next word based on a context:



What is ChatGPT?

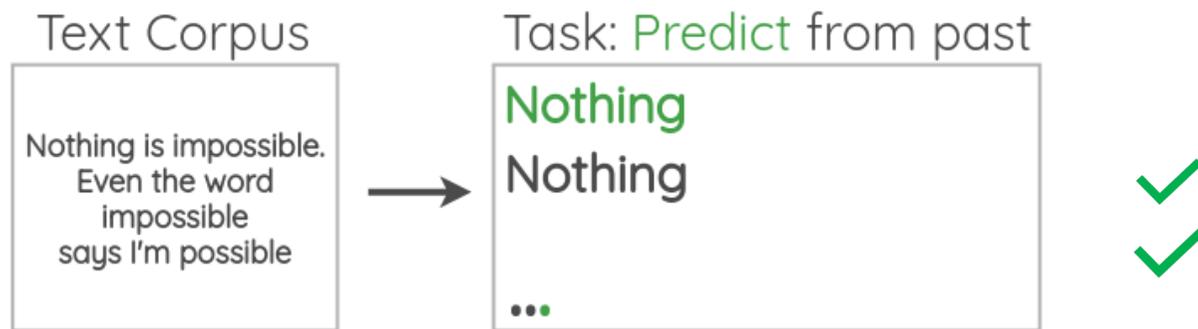
All LLMs are based on the “Transformer” Neural Architecture



Vaswani et al., 2017. Attention is all you need

What is ChatGPT?

How do LLMs learn?



What is ChatGPT?

What did the original GPT-3 learn from?

GPT-3 training data

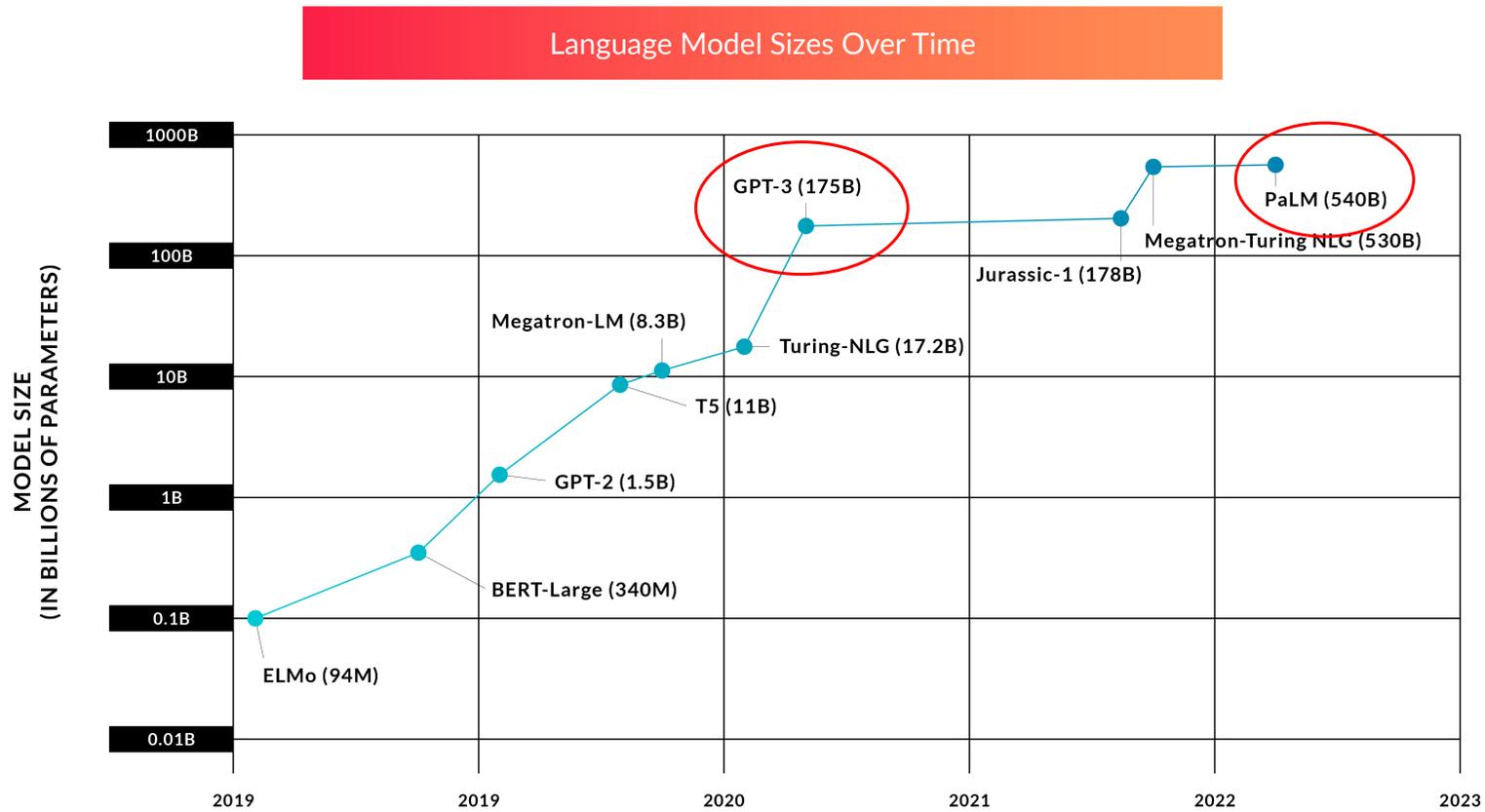


Dataset	# tokens	Proportion within training
Common Crawl	410 billion	60%
WebText2	19 billion	22%
Books1	12 billion	8%
Books2	55 billion	8%
Wikipedia	3 billion	3%

- Initial training cost: ca. 4.6M \$
- Trained on ca. 45 TB of text data

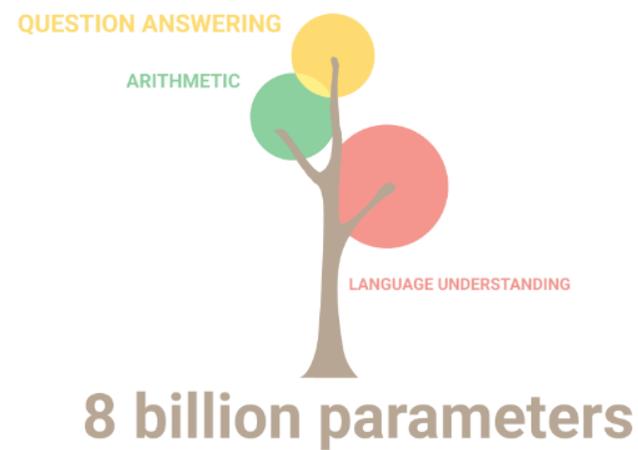
What is ChatGPT?

LLMs are large and get larger every Year



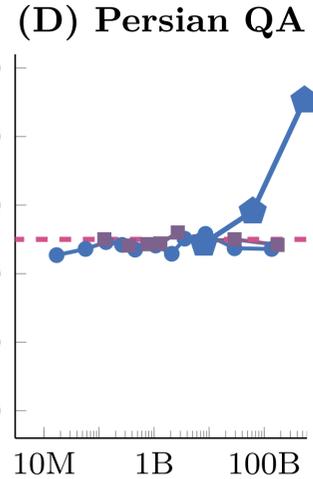
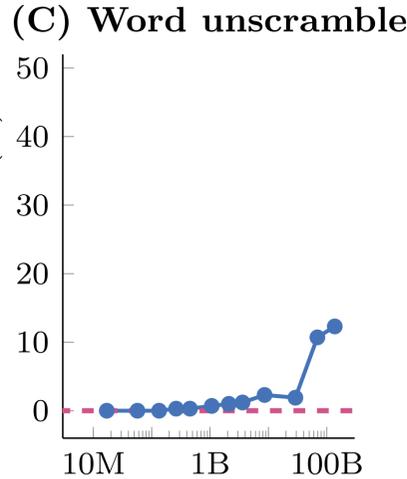
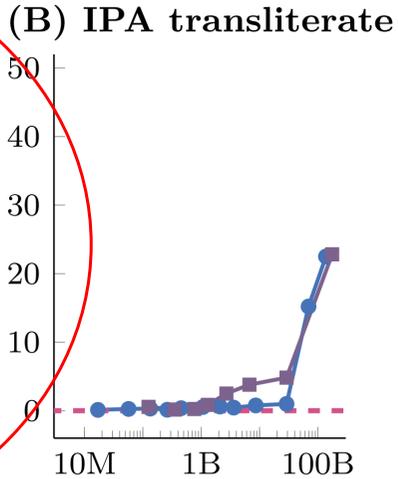
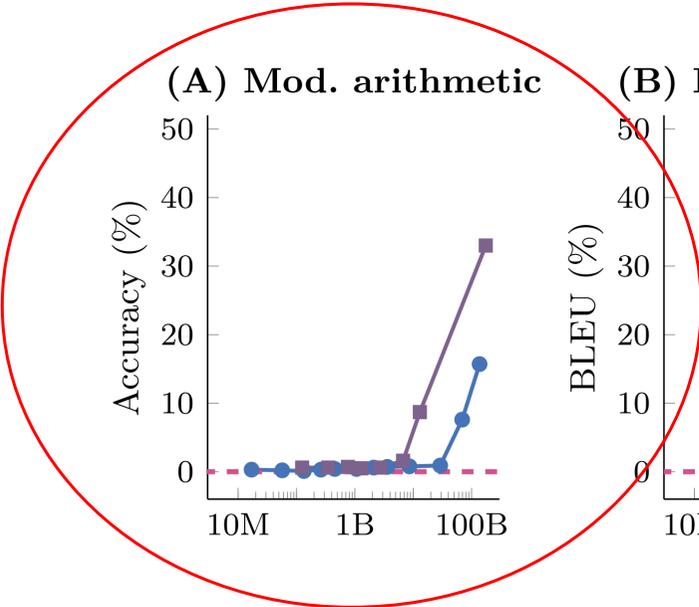
What is ChatGPT?

Scaling Models leads to Emergent Behaviour



Scaling Models leads to Emergent Behaviour

—●— LaMDA —■— GPT-3 —◆— Gopher —▲— Chinchilla —◆— PaLM - - - Random



Wei et al., 2022. Emergent Abilities of Large Language Models

From GPT-3 to ChatGPT: Finetuning on Human Feedback

Step 1

Collect demonstration data and train a supervised policy.

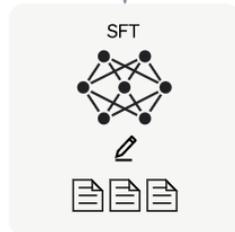
A prompt is sampled from our prompt dataset.



A labeler demonstrates the desired output behavior.



This data is used to fine-tune GPT-3.5 with supervised learning.



Step 2

Collect comparison data and train a reward model.

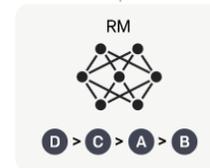
A prompt and several model outputs are sampled.



A labeler ranks the outputs from best to worst.



This data is used to train our reward model.



Step 3: Further Finetuning with Reinforcement Learning

OpenAI, Google, Microsoft & Co.

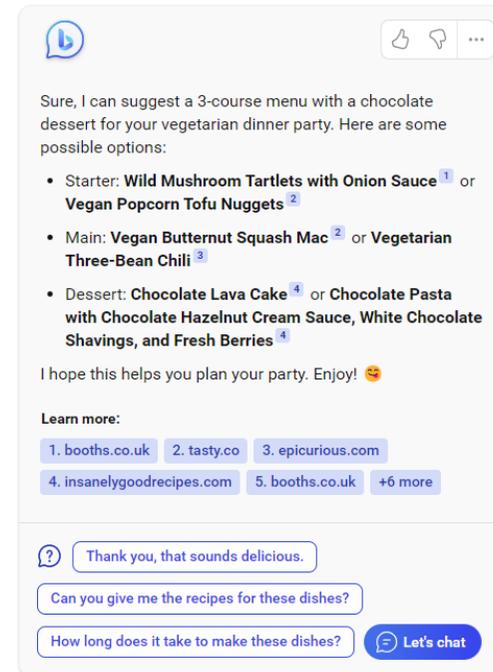
OpenAI: the most famous AI Start-up

- Founded 2015 in a **counter initiative to Googles AI dominance**
- Prominent founding members are **Elon Musk** and **Peter Thiel**, CEO is **Sam Altman**
- The **“Open”** became a bit of a joke as the changed from non-profit to profit in 2019
- In contrary to pure research, OpenAI focus on **engineering good products**. Famous are **GPT-2/3/4, ChatGPT, DALL-E, Codex (Github Copilot), Whisper**
- OpenAI got heavy **investments from Microsoft** (1Billion 2019, 10 Billion 2023) and is heavily integrated in Microsoft products (e.g., Azure, Github)



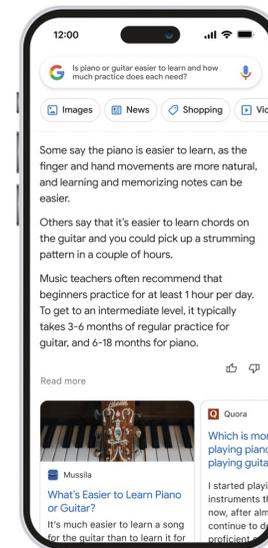
Microsoft

- Microsoft is **heavily invested** in OpenAI
- Microsoft uses the latest version of **ChatGPT integrated in its search, Bing**
- Will massively integrate **GPT-4 into their office products**
- Microsoft, which has a **relatively little share in the global search** market (~2.8%), attempts to increase this **by heavily relying on Conversational AI**
- Microsoft **offers many OpenAI services (e.g. GPT-4) through Azure**. Models are hosted in Western Europe.



Google

- Google was/is for a long time the **leader in AI research**, with landmark papers like e.g. the “Transformer” (2017)
- While google is **using AI heavily for its products** (e.g., Google Lens), it does not offer latest research as API like OpenAI does.
- In contrary to MS, **Google owns ~93% of the global search market** and has a lot to lose by a massive change in search paradigm
- Google makes its **powerful LLMs PaLM (540B Parameter)** accessible to the public via API (April)
- Google is still one (or maybe „the“) major player in AI technologies. **While MS/OpenAI made a powerful move, it’s too early to write Google off**



What can we do with ChatGPT today?

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A Personal Assistant for Health Insurance

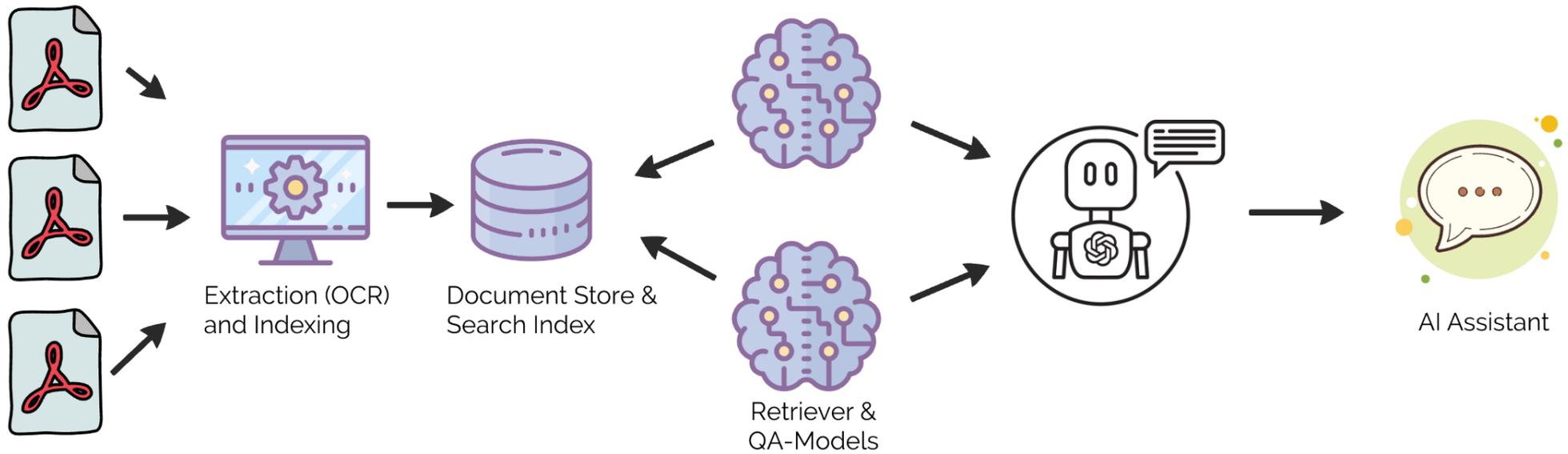
- Use ChatGPT as a personal assistant, but with **fine tuning on a specific case (e.g. Health insurance)**
- Give ChatGPT access to **all insurance policy and product details**.
- The customer can then **ask any questions related to insurance policies or product details** of the company. In addition, he is **talking to an “intelligent” assistant** who can combine and answer almost anything.
- If a customer is **logged in**, he can also ask **specific questions about his private data, for example bills and historical communication** with the health insurance.
- This is possible by **storing all case specific data in a search index or database and combining a generative model (ChatGPT) with a neural search**.



What can we do with ChatGPT today?

Generative Question Answering Architecture

Documents





Neuronale Suche (Beta)

ESG Anlageberatung

Dokumente

3

LLB_2021.pdf (17)



Neue_Bank_2021.pdf (9)



Bank_Alpin_2021.pdf (2)



46 / 289 | + -

Dokument durchsuchen

Ausschluss- und positive Auswahlkriterien kombiniert. Ausgeschlossen sind Investments in Unternehmen, die gegen wichtige nationale oder internationale Normen verstossen oder einen substanziellen Anteil ihres Umsatzes in kontroversen Branchen erzielen. Investiert wird in Unternehmen, welche die drei ESG-Themengebiete («Environment» für Umwelt, «Social» für Soziales und «Governance» für Unternehmensführung) massgeblich berücksichtigen beziehungsweise generell einen Fokus auf den Klimaschutz legen.

Bei ihrer Anlagetätigkeit können unsere Asset Manager neben ihrer langjährigen Erfahrung und ihrem Know-how auch auf einen eigenständigen Ansatz zurückgreifen: das «LLB Multi-Faktor-Modell». Dieses liefert eine breit abgestützte quantitative Analyse grosser Anlageuniversen und damit eine fundierte Basis für die Auswahl der attraktivsten Titel. Wir verfolgen stets das Ziel, mittel- bis langfristig für die Kunden einen überdurchschnittlichen Mehrwert zu schaffen.

Mit unseren Anlageprodukten belegen wir seit Jahren Spitzenplätze bei branchenweiten Auszeichnungen. Auch 2021 konnte die LLB-Gruppe erneut Awards entgegennehmen. So gewann beispielsweise der Fonds LLB Anleihen Schwellenländer ESG in der Kategorie «Rentenfonds Emerging Markets» den deutschen Fondspreis. Die LLB Österreich konnte beim Performance-Projekt IV der FUCHS | RICHTER Prüfinstanz unter 73 Teilnehmern den hervorragenden dritten Platz belegen.

Vermögensverwaltung

Die Bedürfnisse der Kunden stehen bei der LLB-Gruppe im Mittelpunkt. Damit diese ihr Vermögen ihrem Anlagehorizont und der persönlichen Risikobereitschaft entsprechend investieren können, stellen wir fünf Strategien zur Auswahl. Diese reichen von «Konservativ» bis «Aktien» in den Referenzwährungen

LLB-Geschäftsbericht 2021

47

Institutional Clients

CHF, EUR und USD. Bei der Umsetzung ihrer Anlagestrategie können unsere Kunden aus fünf verschiedenen Modellen wählen. Beim sogenannten «LLB Comfort Offering» wird je nach Kundenwunsch global aktiv, in der Schweiz, alternativ, nachhaltig oder auch global passiv investiert. Die LLB Österreich bietet ausserdem mit dem Total-Return-Ansatz eine Mandatsführung mit Fokus auf Werterhalt an.

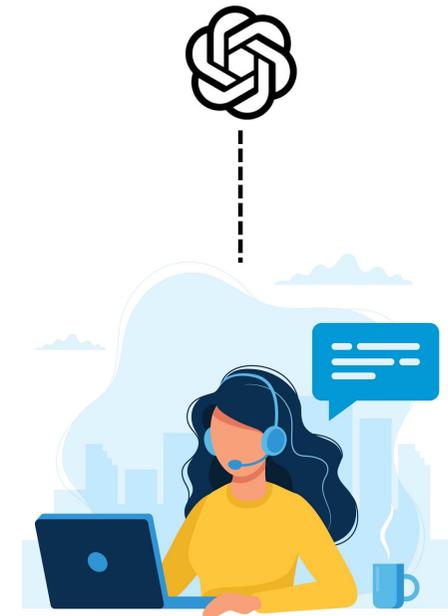
Das Vermögensverwaltungsvolumen belief sich Ende 2021 auf CHF 10.1 Mia. (2020: CHF 8.8 Mia.).



What can we do with ChatGPT today?

Analyse Customer Communication

- **Transcribe phone calls** automatically and in near real-time, for example with **OpenAI's "Whisper"**.
- Use **all customer communication (mails, chats, transcribed phone calls)** for an exhaustive analysis
- **Finetune a GPT-4 model for different use cases.** Send new communication in real-time to the finetuned model and profit from the results.
 - **Summarizing communication:** Summarize calls and mails so that agents get a quick overview on a customer
 - **Analyze customer satisfaction:** Use a fine-tuned sentiment analysis on all communication. Aggregate the results to get an overview on certain customer groups.
 - **Upselling and Cross-Selling:** Automatically identify defined highlights (e.g., person A inherited money) to detect up/cross-selling opportunities
 - **Added Customer Value:** Show important insights in realtime or as a follow-up action



SYSTEM

Du arbeitest bei einer Bank und bekommst Transkripte von Telefongesprächen. Bitte beantworte Fragen dazu.

3A-Kunden anlegen und Ihnen dann via Mobile Banking App die Instruktionen dazukommen lassen, um das Geld möglichst einfach zu verschieben. Haben Sie sonst noch Fragen?

SPEAKER 2 0:02:05:

Nein, das klingt perfekt. Ich danke Ihnen sehr.

SPEAKER 1 0:02:07:

Besten Dank. Schönen Tag. Wiederhören.

SPEAKER 2 0:02:09:

Besten Dank. Adieu.

ASSISTANT



Erwähnt der Kunde, wie viel Geld er transferieren will? Falls ja, wie viel total?



 Add message

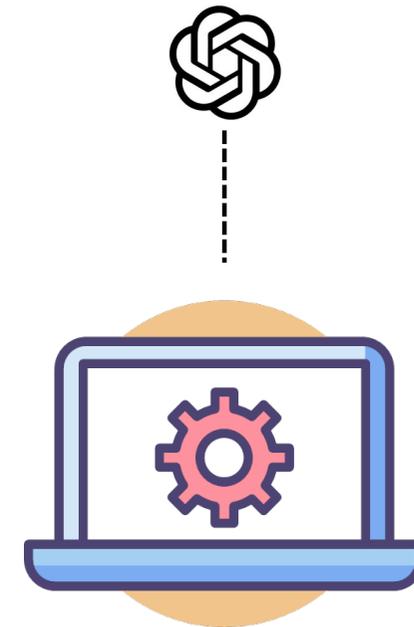
Submit



What can we do with ChatGPT today?

Automate tedious Tasks in Software Engineering

- Many experts discuss if ChatGPT & Co. will **make human developers** in the long run **obsolete**
- Giving a clear answer at this point is hard to say. But **ChatGPT already is and will be even more a powerful tool** for every software engineer in the future
- Future software developers will most probably **focus on steering and supervising a coding model** instead of writing every line of code manually.
- What we can already (semi) **automate today, are code migrations**. This can be a migration from framework X to framework Y, or language A to language B
- All we need to do is **finetuning a GPT-3 model** (preferable a **Codex-Model**) on the task by **showing it a 10 – 100 examples**

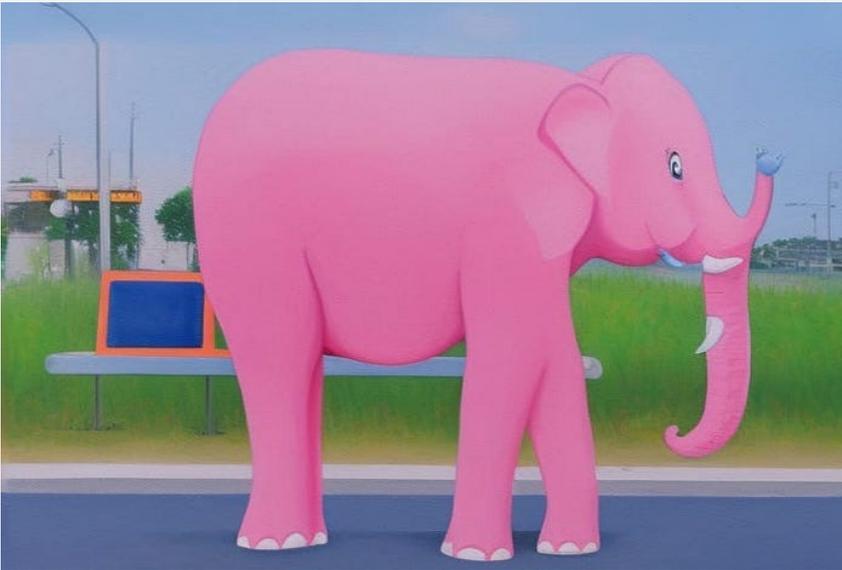


How will we use it tomorrow?

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Fix current issues, mainly “hallucinating”

Hallucination refers to **mistakes in the generated text that are semantically or syntactically plausible but are in fact incorrect or nonsensical.**



BR Can you tell me more about a company in Zürich called ti&m?

Yes, I can provide some information about ti&m, a company located in Zurich, Switzerland. 👍 💬

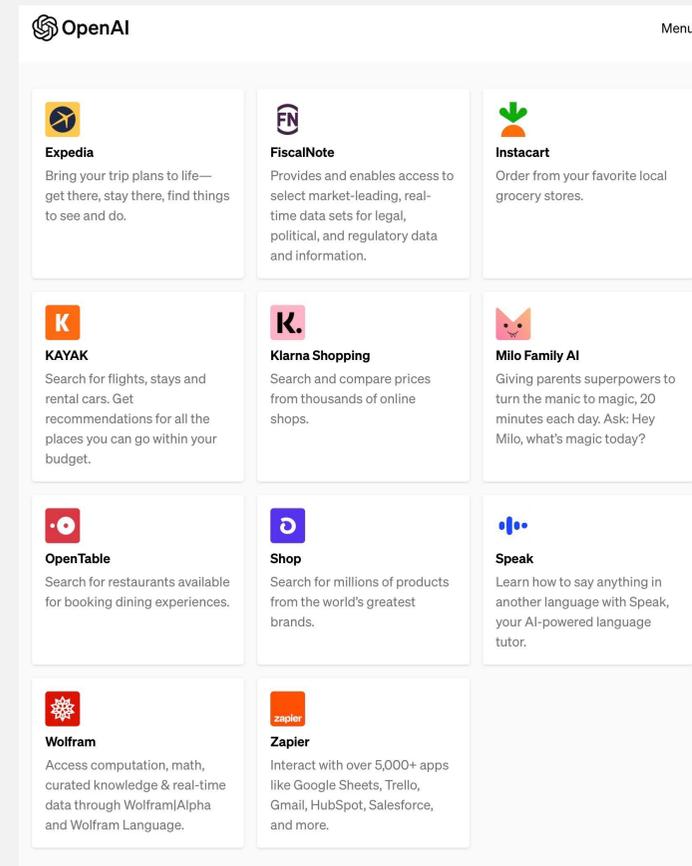
ti&m (Technology, Innovation & Management) is a Swiss-based digital innovation and transformation company founded in 2005. The company provides a range of services to help businesses and organizations innovate and transform digitally, including digital strategy consulting, software development, cybersecurity, and data analytics.

ti&m has grown rapidly since its founding, with a team of over 1,300 employees across Europe, the Middle East, and Asia. The company has received numerous awards for its work, including being named one of Switzerland's top 100 employers in 2021.

How will we use it tomorrow?

From Question Answering to Actions – LLMs become smart Agents

- All ChatGPT and other LLMs do at the moment is **question answering on a very high level**
- LLMs need to store all knowledge and skills in their parameters. **Why not use tools/APIs for different tasks?**



How will we use it tomorrow?

Multimodal Language Models



What is ChatGPT?

(embodied) Multimodal Language Models

Image data

Text data



Driess et al., 2023. PaLM-E: An Embodied Multimodal Language Model

What is ChatGPT?

Multimodal Language Models – Language Only Tasks

Q: Miami Beach borders which ocean? A: **Atlantic.**

Q: What is 372×18 ? A: **6696.**

Language models trained on robot sensor data can be used to guide a robot's actions.

How will we use it tomorrow?

Multimodal Language Models – Visual Question Answering

GPT-4



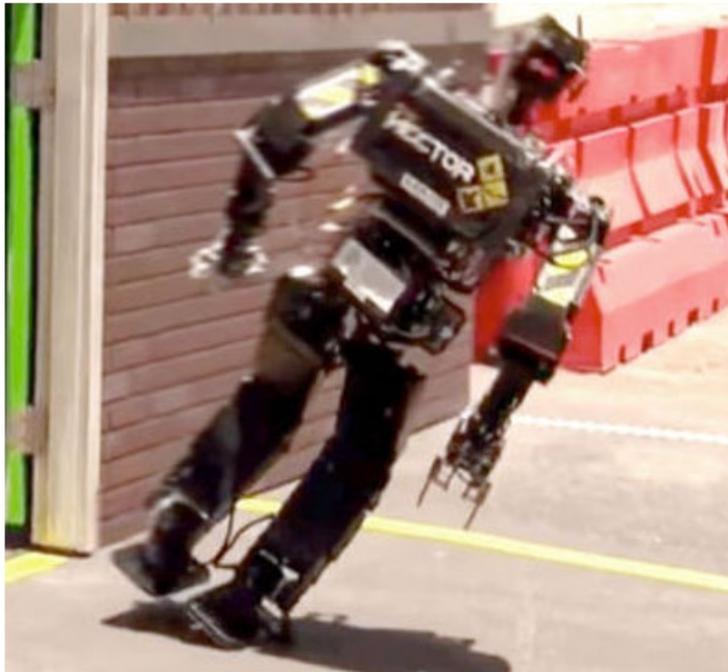
What are a couple of meals I can make with this?

Based on the items visible in the fridge, here are a couple of meal ideas:

- 1) Yogurt parfait: Layer yogurt, strawberries, and blueberries in a bowl or jar. Top with honey or nuts for added texture and flavor.
- 2) Carrot and hummus wrap: Spread hummus on a tortilla or wrap. Top with shredded carrots and any other desired veggies. Roll up and enjoy!

How will we use it tomorrow?

Multimodal Language Models – Physical Prediction



Given **img**. Q: What will the robot do next? A:
fall.

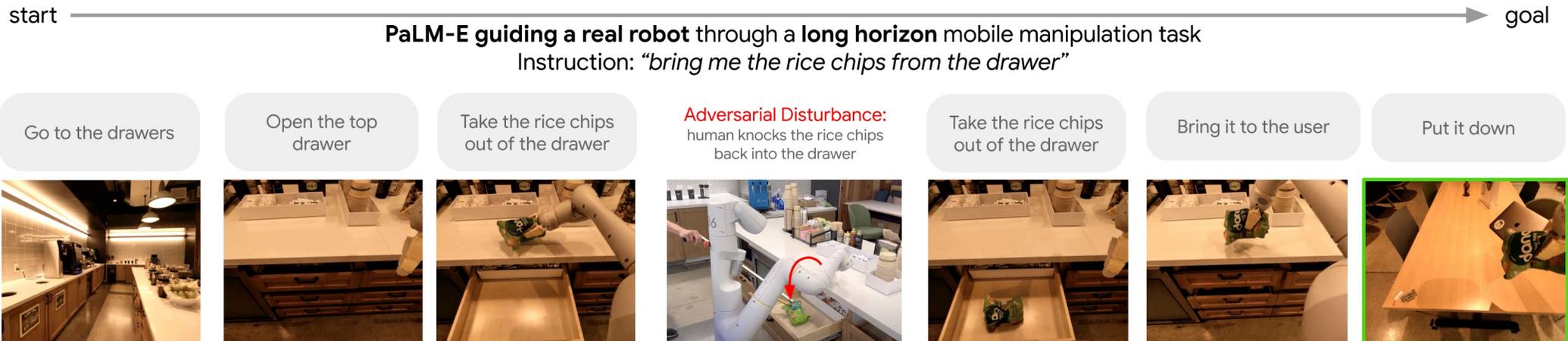
Driess et al., 2023. PaLM-E: An Embodied Multimodal Language Model

Multimodal Language Models – execute long Horizon Tasks in Robotics



How will we use it tomorrow?

Multimodal Language Models – execute long Horizon Tasks in Robotics



Driess et al., 2023. PaLM-E: An Embodied Multimodal Language Model

We digitalize your company.

Thank you!

Get in touch to figure out how YOU can use AI today!

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