Data Science and AI for Medicine Training School

TRAINING: Large Language Models and AI Assistants

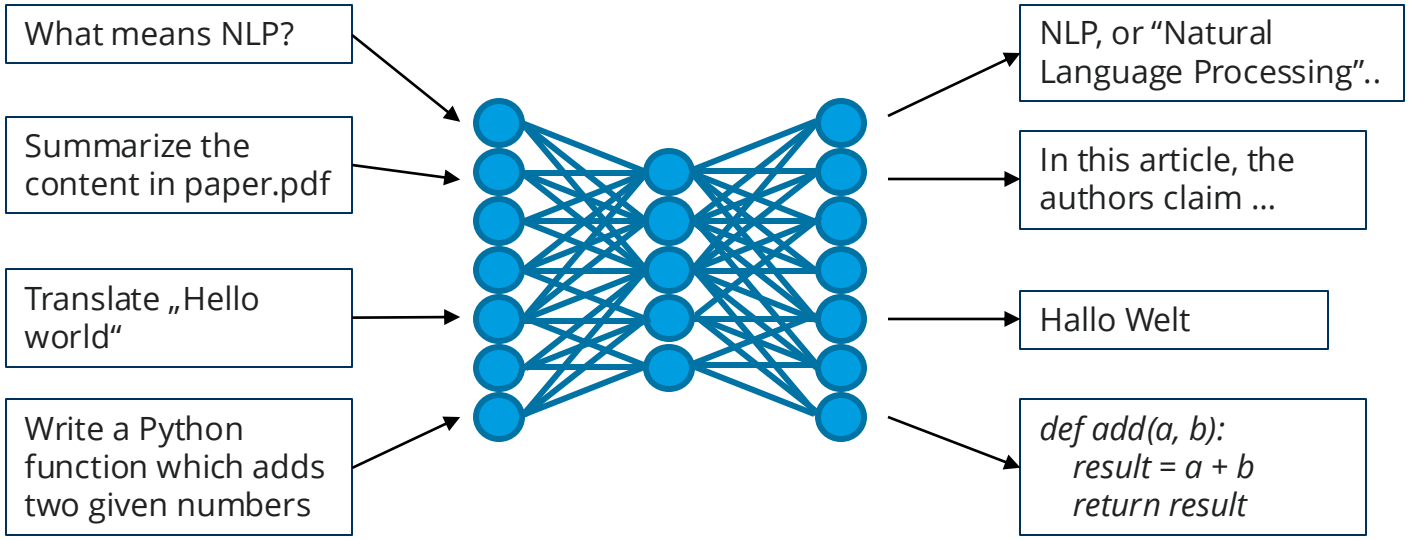
SPEAKER:

GEFÖRDERT VOM
Bundesministerium für Forschung, Technologie und Raumfahrt

SACHSEN
Diese Maßnahme wird gefördert durch die Bundesregierung aufgrund eines Beschlusses des Deutschen Bundestages.
Diese Maßnahme wird mitfinanziert durch Steuermittel auf der Grundlage des von den Abgeordneten des Sächsischen Landtags beschlossenen Haushaltes.

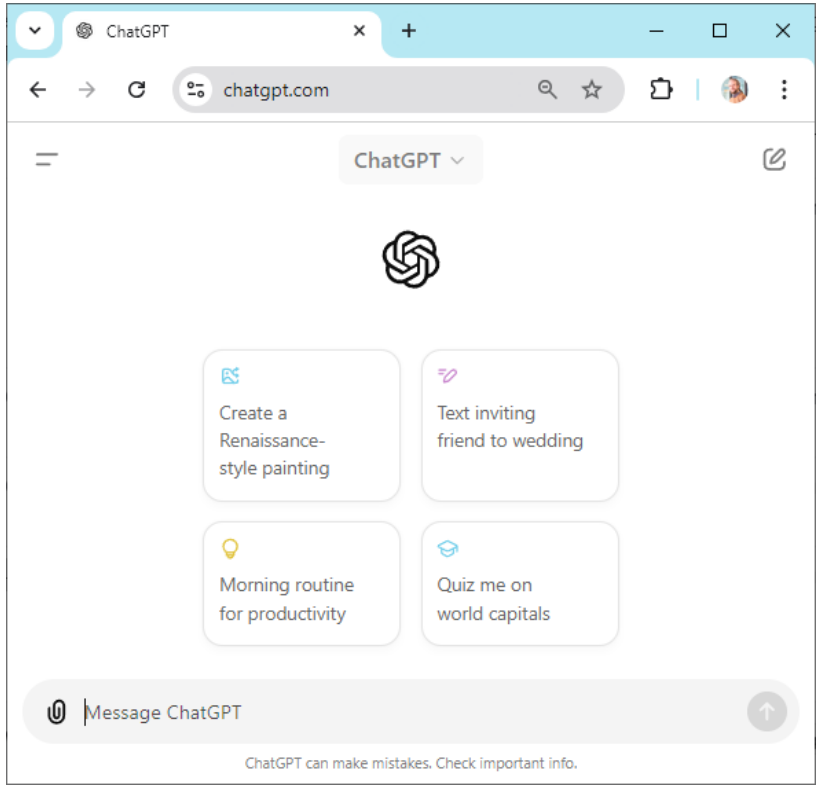
LLM Services
What is an LLM?

- Advanced AI models (Neural Networks / Deep Learning), trained on large amounts of text data
- Aim to understand and generate human language
- Can take context into account and interact with users
- Can perform a variety of tasks depending on further specialization:
  - Answering questions
  - Summarizing texts
  - Translating
  - Generating code
  - Additional functions, e.g. web search



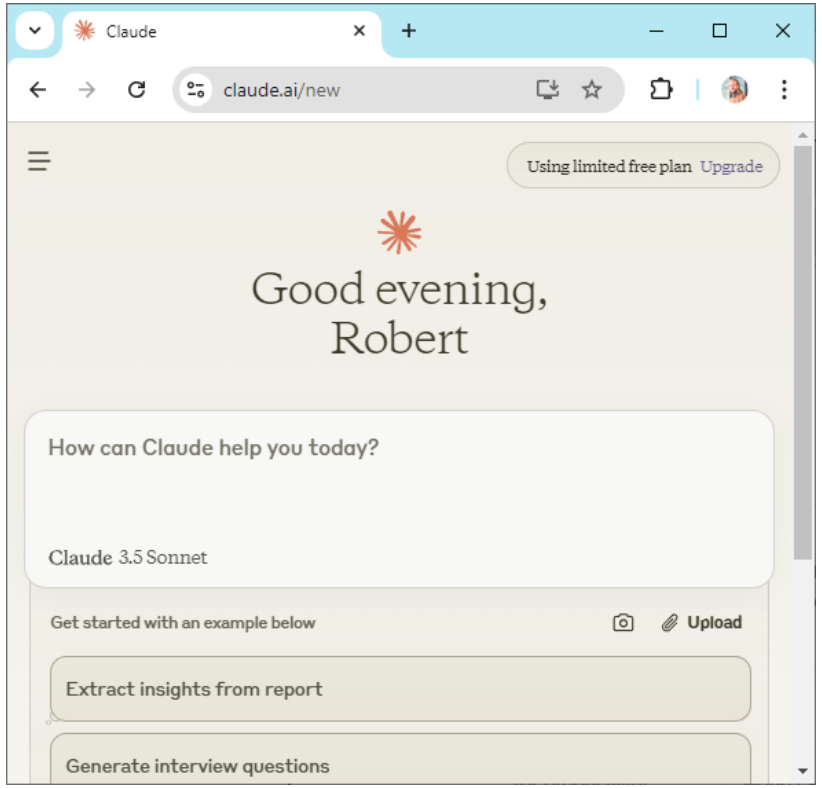
LLM Services
Setup and usage

ChatGPT



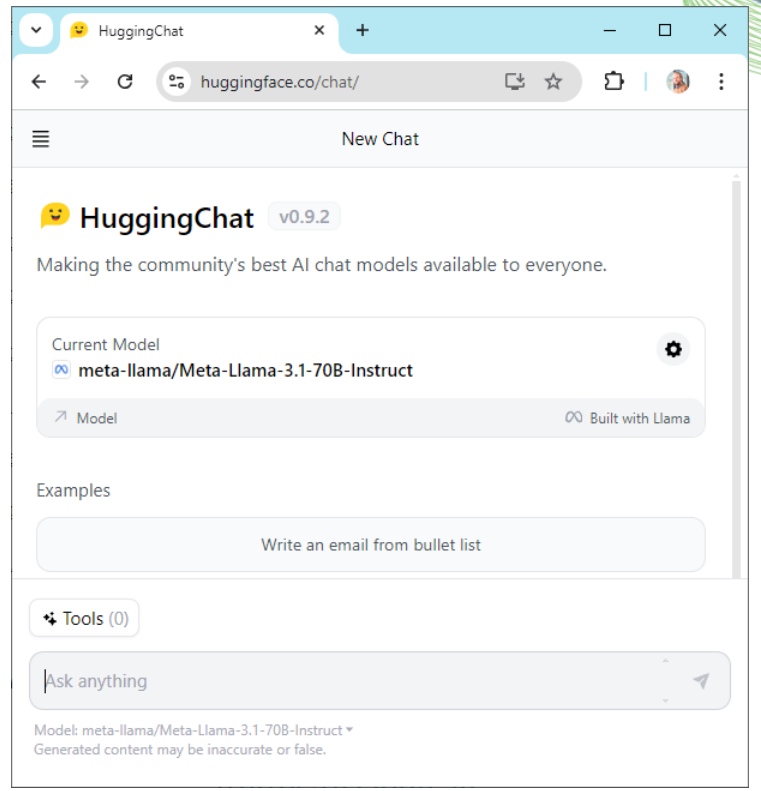
https://chatgpt.com/

Claude



https://claude.ai/

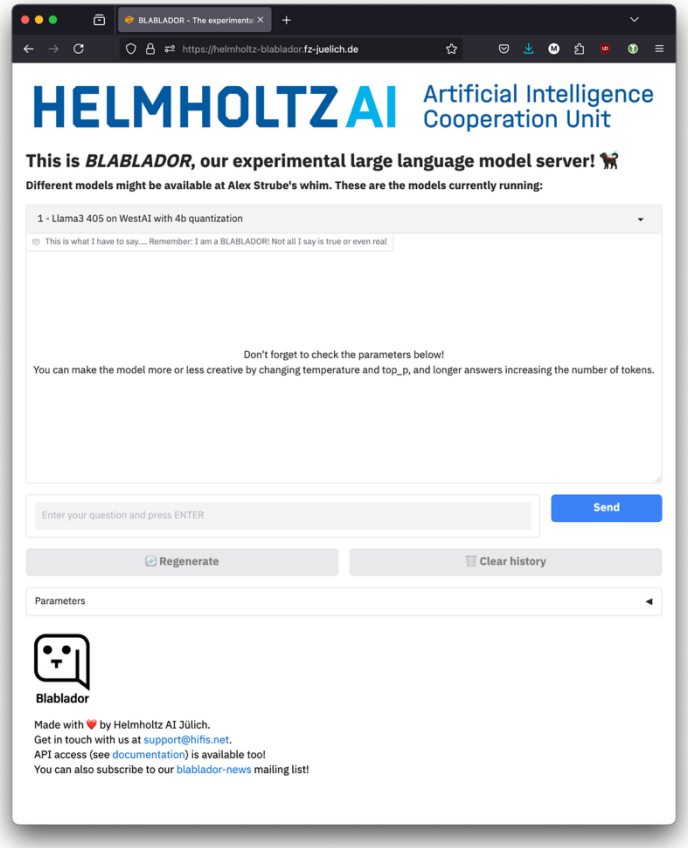
Open models



https://huggingface.co/chat/

LLM Services
Setup and usage

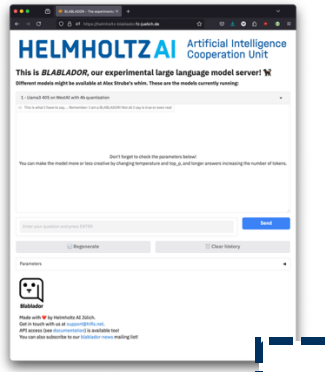
Helmholtz Blablador



https://helmholtz-blablador.fz-juelich.de/

- Various providers with their own services and LLMs
- Proprietary to open-source, paid to free
- Server locations worldwide, in Europe, in Germany
- Basic technical structure and concepts are usually similar

LLM Services
Setup and usage



Browser

Login and Usage with Username / Password

Store API Key on local PC

With active login: create API Key

Code

Login and Usage with API Key

Provider Server „Provider“

Web-Service with Chat

LLM A

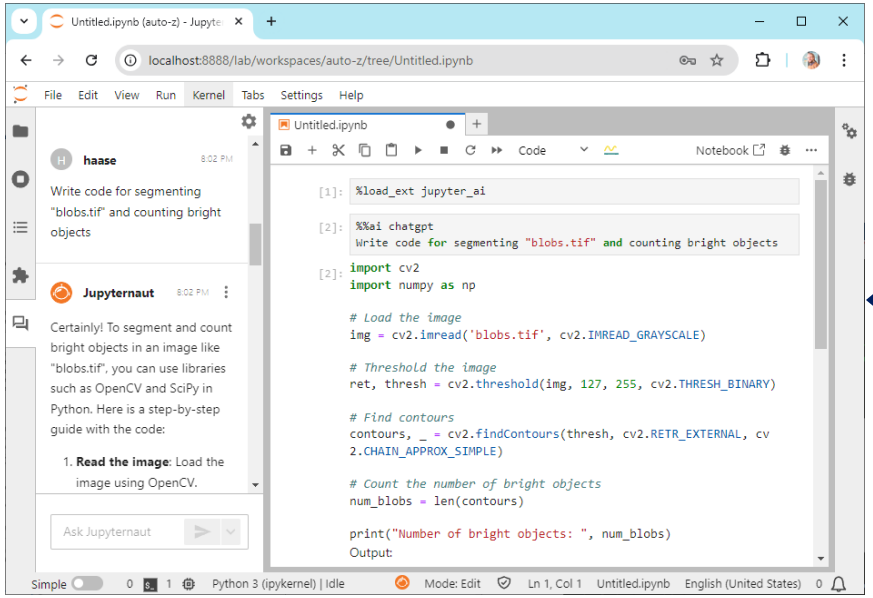
LLM B

API

Provider-ID/Modell-ID

AI Assistants
Technical Overview

- Integration of LLM functions into existing tools and services
  - Chatbots on websites
  - AI assistants in MS365, Adobe Cloud, ...
  - AI assistants in programming environments (IDE, ...)
- For Jupyter Lab, e.g., via "jupyter-ai" or "bia-bob"



Login with API Key

blablador/alias-fast

Software package or plugin for chat, text or code generation, etc connected to →

Provider

API

LLM A

LLM B

Alternative: Direct local access, needs according hardware performance

Local Computer

Local LLM Service

API

LLM a

AI Assistants
Usage and Limitations

Prompt Engineering

- Prompt: Instruction for the AI assistant / LLM to fulfill a task
- Formulate as precisely as possible and provide useful context
- Iterative modification of the prompt until the desired result is achieved

Limitations

- Prompts and context are transmitted to the LLM - when using an external LLM service provider, this means data transmission to external servers, so data protection must be considered!
- The AI assistant is only as good as the LLM used in the backend - variations in answer quality, available languages, knowledge level, code generation capability, ...
- The context window (number of tokens) has limitations and varies depending on the LLM

In this training, we use "bia-bob" (AI assistant for Jupyter) with Blablador (LLM provider Helmholtz / FZ Jülich)

(https://github.com/haesleinhuepf/bia-bob)
(https://helmholtz-blablador.fz-juelich.de)