



Generative KI

Kapitel 4 – LangChain und Generative KI

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Heute:

- **Beispiellösungen Übungszettel 01**

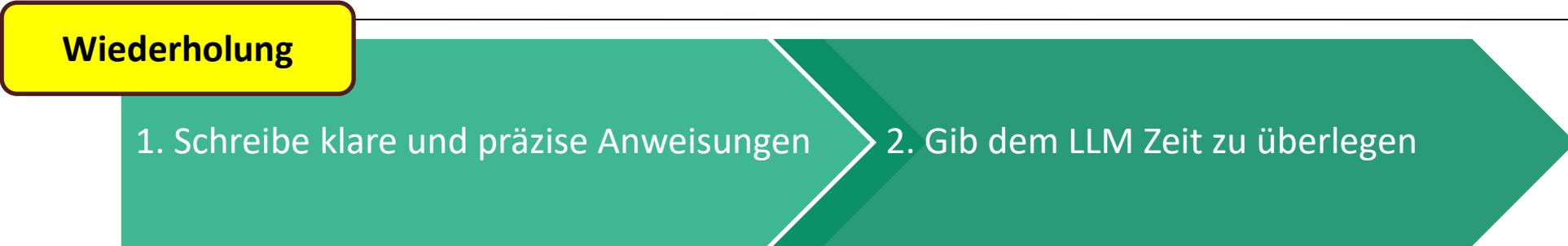
- **Übungszettel 02 (bis 27.05.24)**

1

Anwendungen bauen mit LangChain

Prinzipien des Prompt Engineerings

Wiederholung

- 
1. Schreibe klare und präzise Anweisungen
 2. Gib dem LLM Zeit zu überlegen

1. Präzise ist nicht gleich kurz.
2. Verwende Trennzeichen.
3. Fordere strukturierten Output an.
4. Überprüfe, ob Bedingungen erfüllt sind.

1. Gib dem LLM die Arbeitsschritte vor.
2. Weise das LLM an, zuerst seine eigene Lösung zu erarbeiten, anstatt direkt eine Antwort zu geben.

Prompt Strategien

Wiederholung

Prompt Engineering: Entwickeln von Strategien

Technisch: Optimierung mit technischem Verständnis

Prgamatisch: Optimierung, um zu lernen, was in der Praxis funktioniert

Je nach **Anwendungsfall** verschiedene Strategie sinnvoll

Stetige **Entwicklung**, immer neue Strategien werden „entdeckt“

Zero-shot Prompt

Eine Eingabe mit einer Anweisung



One-shot Prompt

Eine Eingabe mit einer Anweisung und einem Beispiel



Few-shot Prompt

Eine Eingabe mit einer Anweisung und mehreren Beispielen



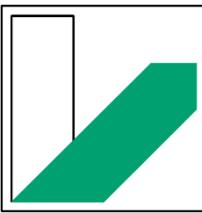
Chained Prompting

Mehrere Eingaben mit Anweisungen und Beispielen



Shin et al., 2020, Brown et al., 2020

<https://www.br.de/nachrichten/netzwelt/ki-schafft-neue-jobs-was-macht-eigentlich-ein-prompt-engineer,TX4P23Z>



Komplexe Prompts: Das Rad stets neu erfinden?

```
prompt = """  
Your task is to determine if  
the student's solution is  
correct or not.
```

```
To solve the problem do the following:  
- First, work out your own solution to the problem.  
- Then compare your solution to the student's solution  
and evaluate if the student's solution is correct or not.  
...  
Use the following format:  
Question:  
...  
question here  
...  
Student's solution:  
...  
student's solution here  
...  
Actual solution:  
...  
...  
steps to work out the solution and your solution here  
...  
Is the student's solution the same as actual solution \  
just calculated:  
...  
yes or no  
...  
Student grade:  
...  
correct or incorrect  
...  
  
Question:  
...  
(question)  
...  
Student's solution:  
...  
(student_solution)  
...  
Actual solution:  
"""
```

Prompts can be
long and detailed.

Reuse good
prompts when
you can!

LangChain also
provides prompts
for common
operations.



LangChain: Einführung

Founder & Lead Developer: Harrison Chase

Ideen:

- Wiederverwendbarkeit von guten Prompts
- „Boiler Plate Code“ vereinfachen
- Zusätzliche Funktionalitäten bereitstellen

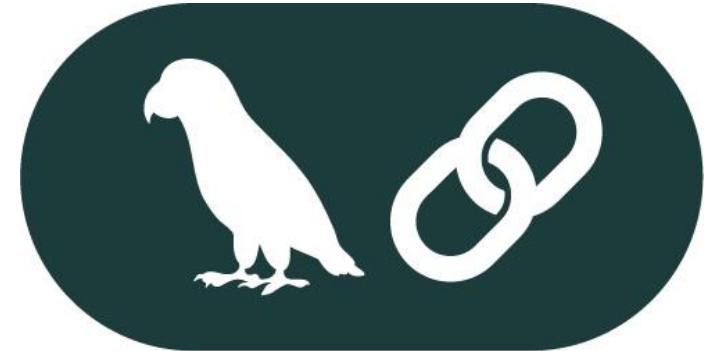
Gestartet Oktober 2022 als Open Source Projekt

Erste Releases ab Januar 2023 auf GitHub (v.0.0.64 vom 16.01.23)

April 2023: Gründung als Incorporated (LangChain, Inc.)

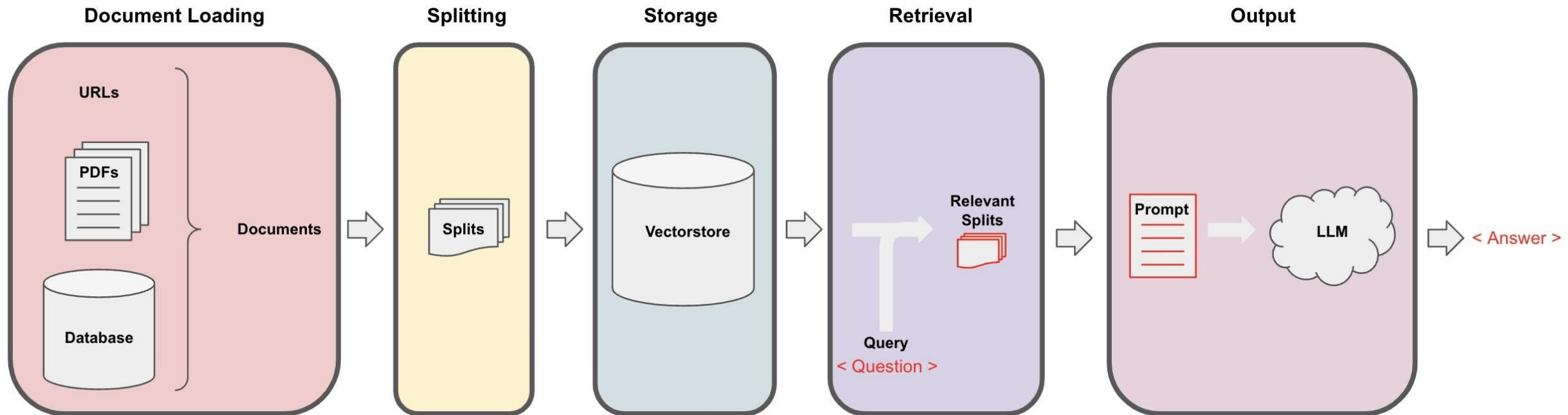
\$ 20M Venture Capital eingenommen

Geschätzter Wert: \$ 200M



LangChain

LangChain: Einführung





Components

- Prompts
 - Prompt Templates
 - Output Parsers: 5+ implementations
 - Retry/fixing logic
 - Example Selectors: 5+ implementations
- Models
 - LLM's: 20+ integrations
 - Chat Models
 - Text Embedding Models: 10+ integrations
- Indexes
 - Document Loaders: 50+ implementations
 - Text Splitters: 10+ implementations
 - Vector stores: 10+ integrations
 - Retrievers: 5+ integrations/implementations
- Chains
 - Can be used as building blocks for other chains
 - More application specific chains: 20+ different types
- Agents
 - Agent Types: 5+ types
 - Algorithms for getting LLMs to use tools
 - Agent Toolkits: 10+ implementations
 - Agents armed with specific tools for a specific application



LangChain: Prompt Templates

Prompt Template:

Wiederverwendbares Element, um einen Prompt zu generieren

Kann u.a. enthalten:

- Anweisungen an das LLM
- Few-Shot Beispiele für die Antwort
- Anfrage (Query) an das LLM

```
from langchain.llms import OpenAI
# decouple to read .env variables(OpenAI Key)
from decouple import config
# import openAI from langChain
from langchain.llms import OpenAI
# import prompt template
from langchain import PromptTemplate

# create the prompt
prompt_template: str = """/
You are a vehicle mechanic, give responses to the following/
question: {question}. Do not use technical words, give easy/
to understand responses.
"""

prompt = PromptTemplate.from_template(template=prompt_template)

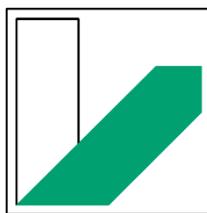
# format the prompt to add variable values
prompt_formatted_str: str = prompt.format(
    question="Why won't a vehicle start on ignition?")

# instantiate the OpenAI instance
llm = OpenAI(openai_api_key=config("OPENAI_API_KEY"))

# make a prediction
prediction = llm.predict(prompt_formatted_str)

# print the prediction
print(prediction)
```

<https://medium.com/@princekrampah/prompt-templates-in-langchain-248c015be3e0#:~:text=%E2%80%9CA%20prompt%20template%20refers%20to,question%20to%20the%20language%20model.>



LangChain: Indexes / Document Loader

Vector Stores

1. Load Source Data



Load, Transform, Embed

Vector Store

0.5, 0.2....0.1, 0.9
:
2.1, 0.1....-1.7, 0.9

Embed
5.5, -0.3...
2.1, 0.1

2. Query Vector Store

XXXXXXXXXXXXXX
XXXXXXXXXXXXXX

XXXXXXXXXXXXXX
XXXXXXXXXXXXXX

3. Retrieve 'most similar'

https://python.langchain.com/docs/modules/data_connection/vectorstores/



LangChain: Indexes / Document Loader

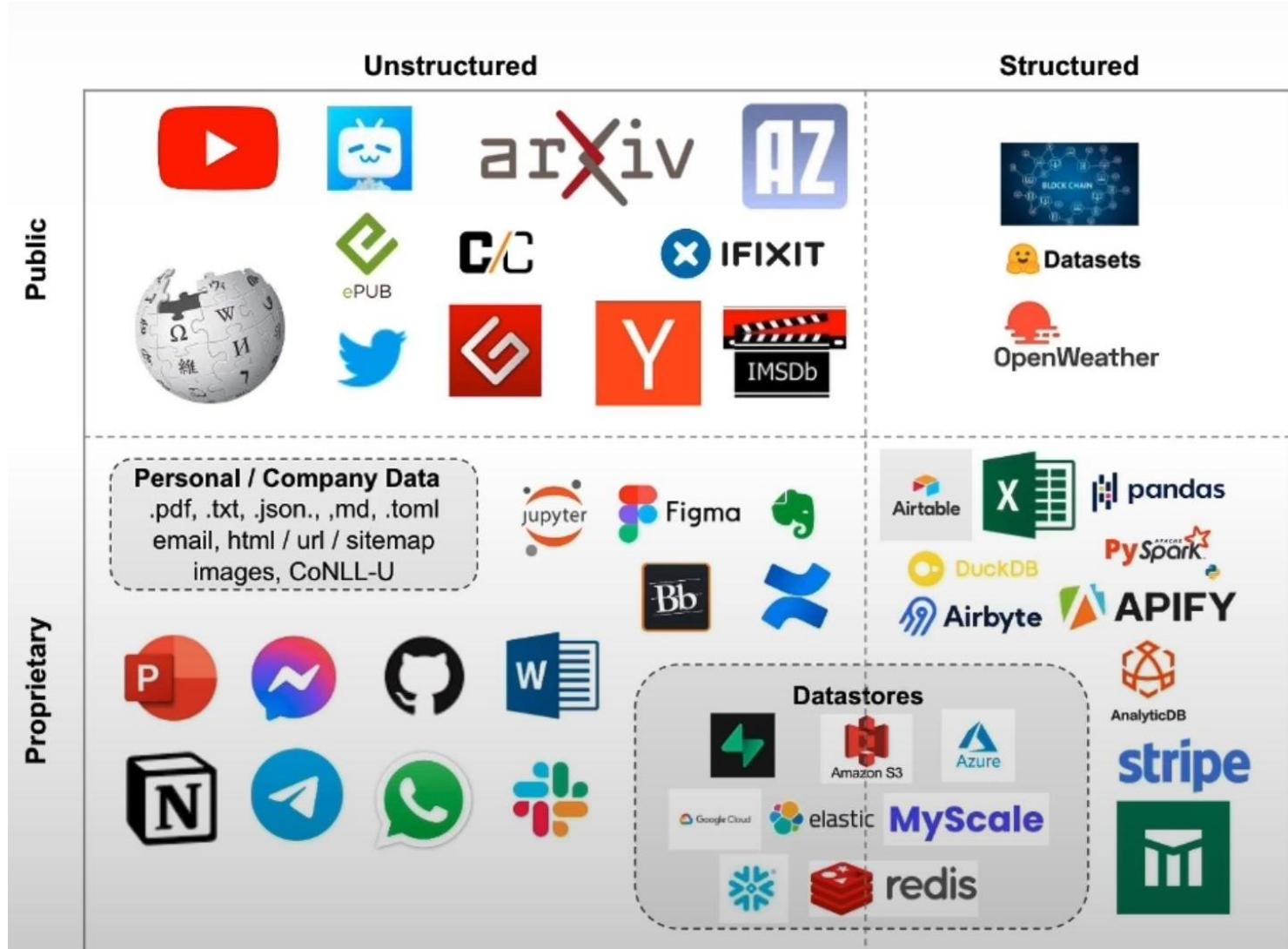
Loader greifen auf Daten zu und konvertieren diese in ein internes 'document' Objekt

Zugriff auf:

- Web Seiten (Wikipedia)
- Datenbanekn
- Youtube
- arXiv
- ...

Datentypen:

- PDF
- HTML
- JSON
- Word, Powerpoint
- ...





Chunking

Transformer (machine learning model)

[Article](#) [Talk](#)

From Wikipedia, the free encyclopedia

A **Transformer** is a deep learning architecture that relies on the attention mechanism.^[1] It is notable for requiring less training time compared to previous recurrent neural architectures, such as long short-term memory (LSTM),^[2] and has been prevalently adopted for training large language models on large (language) datasets, such as the [Wikipedia Corpus](#) and [Common Crawl](#), by virtue of the parallelized processing of input sequence.^[3] More specifically, the model takes in tokenized (byte pair encoding) input tokens, and at each layer, contextualizes each token with other (unmasked) input tokens in parallel via attention mechanism. Though the Transformer model came out in 2017, the core attention mechanism was proposed earlier in 2014 by Bahdanau, Cho, and Bengio for machine translation.^{[4][5]} This architecture is now used not only in natural language processing, computer vision,^[6] but also in audio,^[7] and multi-modal processing. It has also led to the development of pre-trained systems, such as generative pre-trained transformers (GPTs)^[8] and BERT^[9] (Bidirectional Encoder Representations from Transformers).

Background [\[edit\]](#)

Before transformers, most state-of-the-art NLP systems relied on gated RNNs, such as [LSTMs](#) and [gated recurrent units \(GRUs\)](#), with various attention mechanisms added to them. Unlike RNNs, transformers do not have a recurrent structure. Provided with enough training data, their attention mechanisms alone can match the performance of RNNs with attention added.^[1]

Previous work [\[edit\]](#)

In 1992, Jürgen Schmidhuber published the fast weight controller as an alternative to RNNs that can learn "internal spotlights of attention,"^[10] and experimented with using it to learn [variable binding](#).^[11]

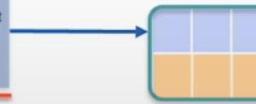
In a fast weight controller, a feedforward neural network ("slow") learns by gradient descent to control the weights of another neural network ("fast") through outer products of self-generated activation patterns called "FROM" and "TO" which corresponds to "key" and "value" in the attention mechanism.^[12] This fast weight is applied to queries. The attention mechanism may be obtained by interposing a softmax operator and three linear operators (one for each of query, key, and value).^{[12][13]}

Flawed sequential processing [\[edit\]](#)

Models, used before the transformer models prevailed, processed the input tokens sequentially, maintaining a state vector representing all the tokens up to the current token in the input. To process the n th token, such a model combined the vector representing the sentence up to token $n - 1$ with the information of the new token to create a new state, representing the sentence up to token n . Theoretically, the information from one token can propagate arbitrarily far down the sequence, if at every point the state continues to encode contextual information about the token.

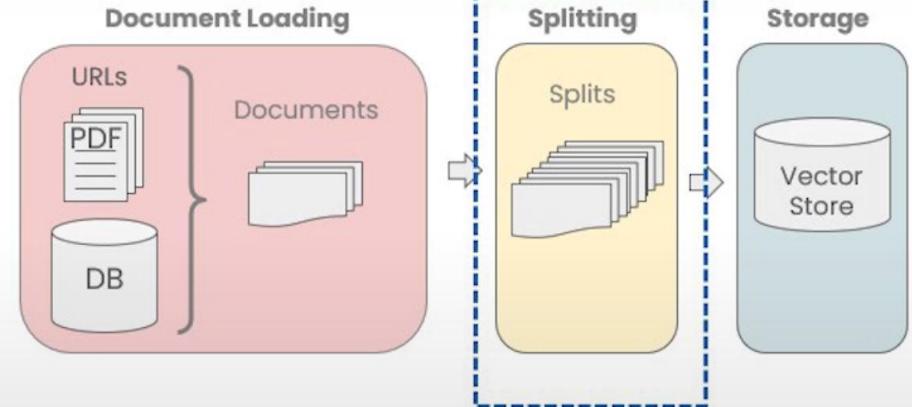
Query

Do transformers have a recurrent structure?



Document Splitting

- **Splitting Documents into smaller chunks**
 - Retaining meaningful relationships!



... on this model. The Toyota Camry has a head-snapping 80 HP and an eight-speed automatic transmission that will ...

Chunk 1: on this model. The Toyota Camry has a head-snapping

Chunk 2: 80 HP and an eight-speed automatic transmission that will

Question: What are the specifications on the Camry?



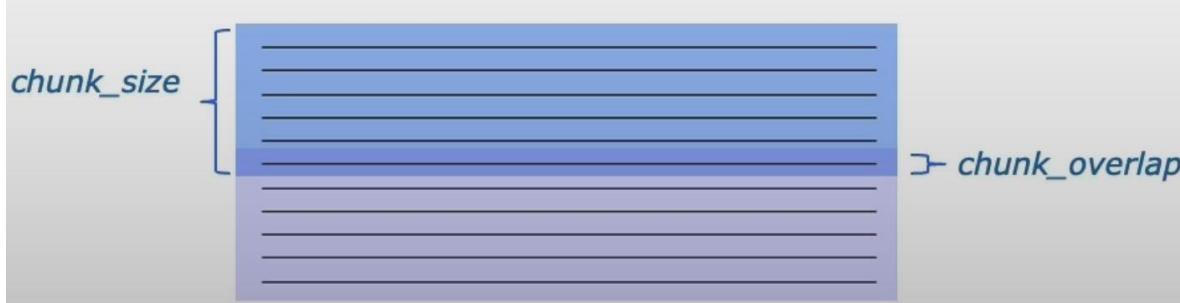
Example Splitter

```
langchain.text_splitter.CharacterTextSplitter(  
    separator: str = "\n\n"  
    chunk_size=4000,  
    chunk_overlap=200,  
    length_function=<builtin function len>,  
)
```

Methods:

`create_documents()` - Create documents from a list of texts.

`split_documents()` - Split documents.



Types of splitters

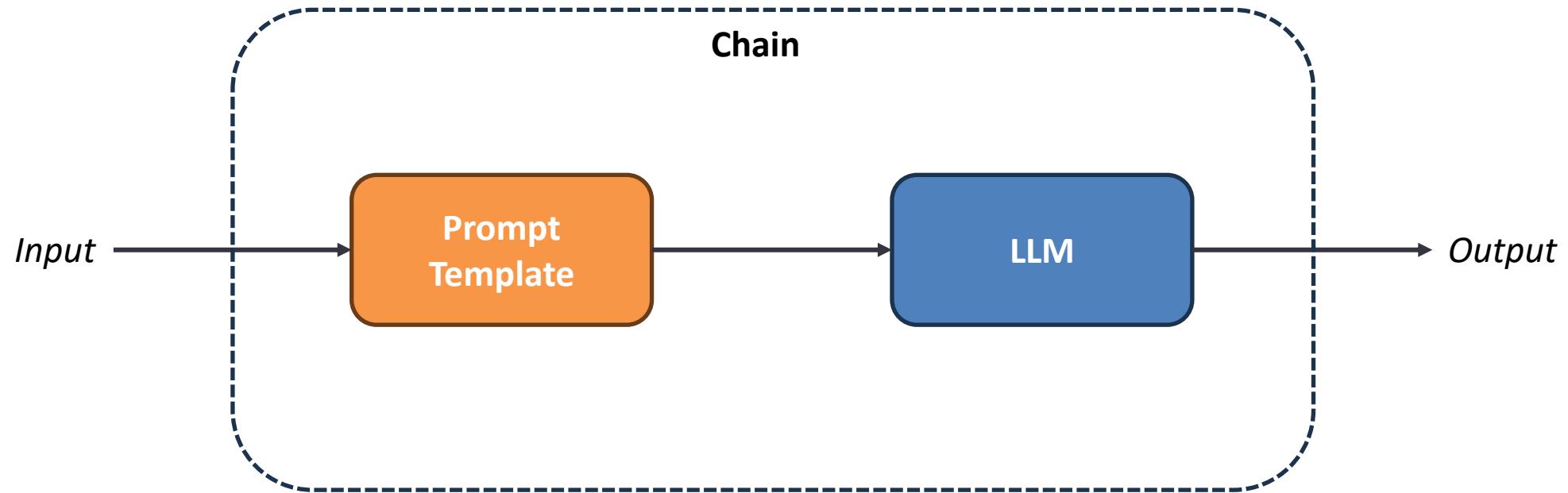
`langchain.text_splitter.`

- **CharacterTextSplitter()** - Implementation of splitting text that looks at characters.
- **MarkdownHeaderTextSplitter()** - Implementation of splitting markdown files based on specified headers.
- **TokenTextSplitter()** - Implementation of splitting text that looks at tokens.
- **SentenceTransformersTokenTextSplitter()** - Implementation of splitting text that looks at tokens.
- **RecursiveCharacterTextSplitter()** - Implementation of splitting text that looks at characters. Recursively tries to split by different characters to find one that works.
- **Language()** – for CPP, Python, Ruby, Markdown etc
- **NLTKTextSplitter()** - Implementation of splitting text that looks at sentences using NLTK (Natural Language Tool Kit)
- **SpacyTextSplitter()** - Implementation of splitting text that looks at sentences using Spacy



LangChain: Chains / Chain Definition

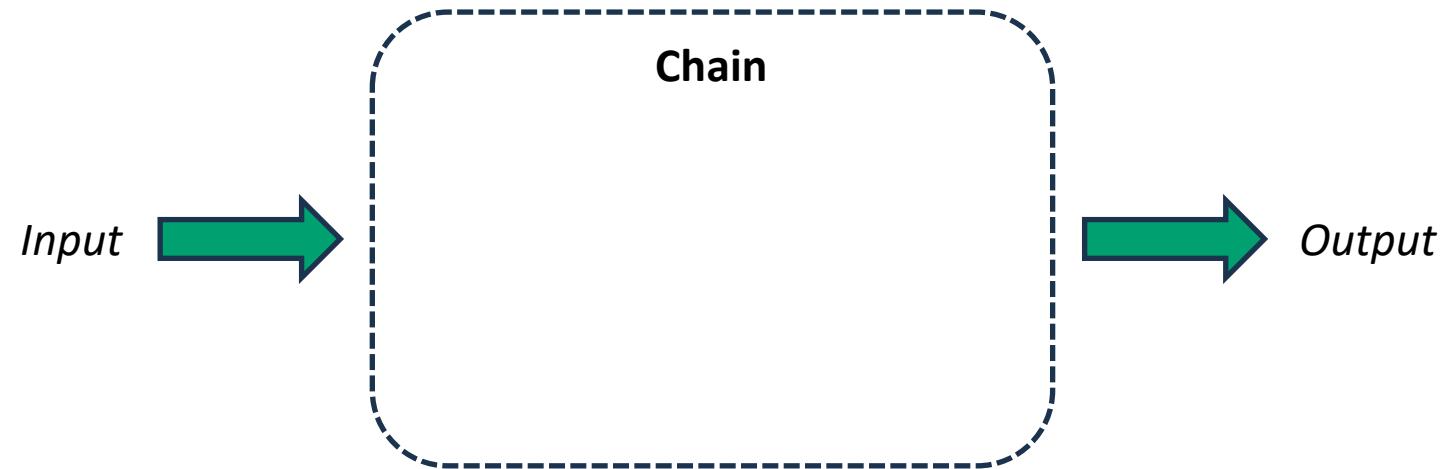
➤ Grundsätzliche Funktionsweise



➤ Derzeit 46 spezialisierte Chains in LangChain enthalten



LangChain: Chains / LLMChain



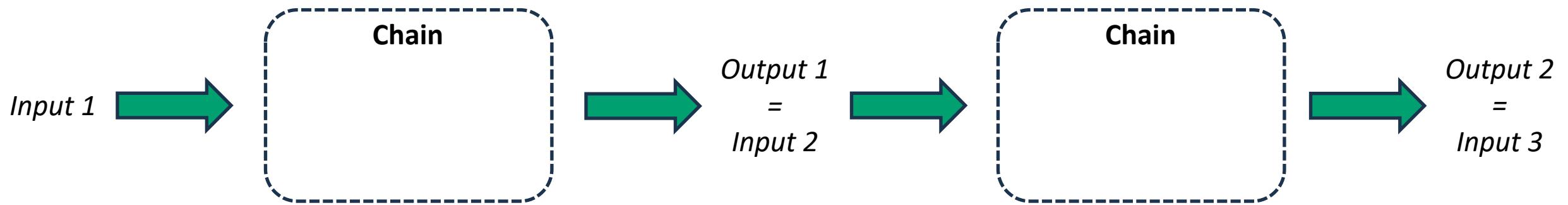


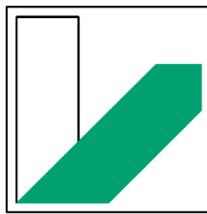
LangChain: Chains / LLMChain

```
1 |  
2 |  
3 |   from langchain.chat_models import ChatOpenAI  
4 |   from langchain.prompts import ChatPromptTemplate  
5 |   from langchain.chains import LLMChain  
6 |  
7 |  
8 |     llm = ChatOpenAI(temperature=0.9, model="gpt-3.5-turbo")  
9 |  
10|     prompt = ChatPromptTemplate.from_template(  
11|         "What is the best name to describe a company that makes {product}?"  
12|     )  
13|  
14|     chain = LLMChain(llm=llm, prompt=prompt)  
15|  
16|     product = "Queen Size Sheet Set"  
17|     chain.run(product)  
18|
```



LangChain: Chains / SimpleSequentialChain

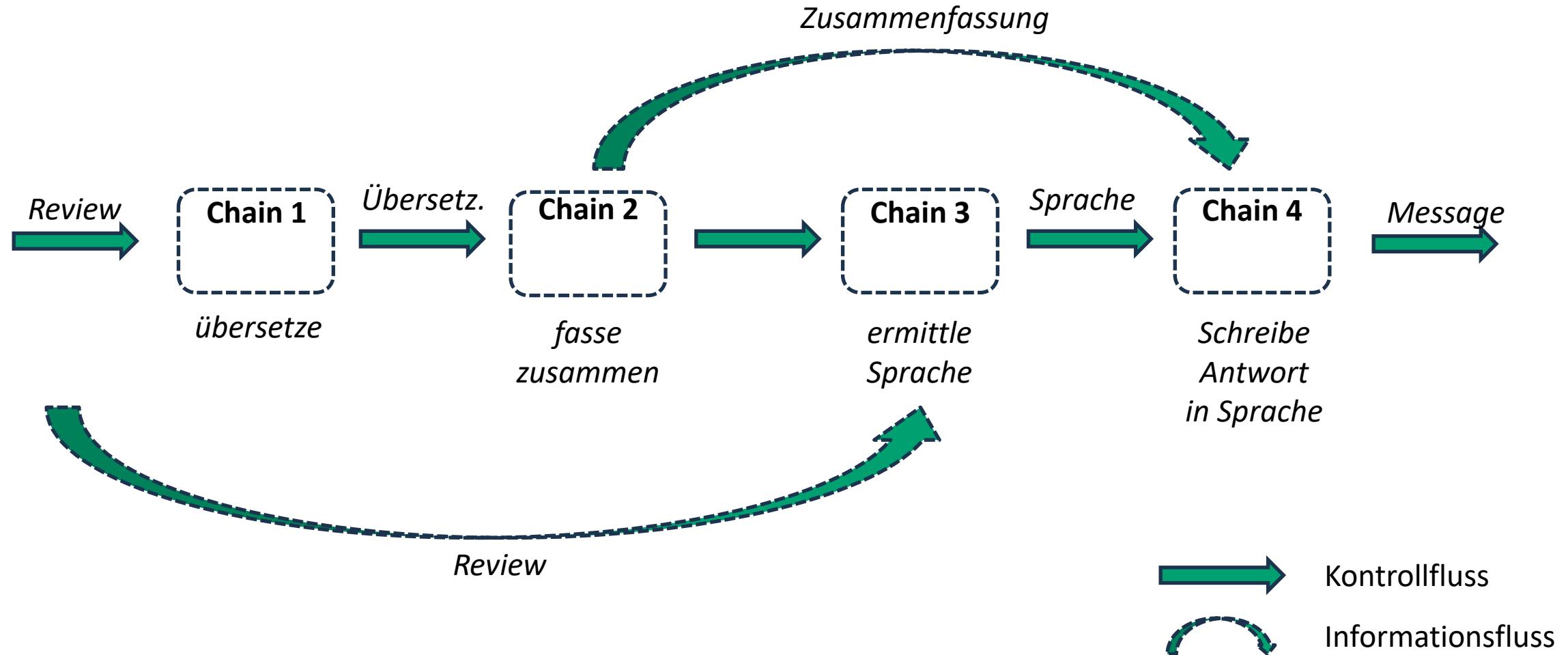
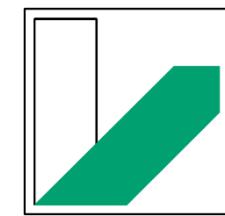




LangChain: Chains / SimpleSequentialChain

```
1
2
3 from langchain.chat_models import ChatOpenAI
4 from langchain.prompts import ChatPromptTemplate
5 from langchain.chains import LLMChain
6 from langchain.chains import SimpleSequentialChain
7
8 llm = ChatOpenAI(temperature=0.9, model="gpt-3.5-turbo")
9
10 # prompt template 1
11 first_prompt = ChatPromptTemplate.from_template(
12     "What is the best name to describe a company that makes {product}?"
13 )
14
15 # Chain 1
16 chain_one = LLMChain(llm=llm, prompt=first_prompt)
17
18 # prompt template 2
19 second_prompt = ChatPromptTemplate.from_template(
20     "Write a 20 words description for the following company:{company_name}"
21 )
22
23 # chain 2
24 chain_two = LLMChain(llm=llm, prompt=second_prompt)
25
26 # Simple Sequential Chain
27 overall_simple_chain = SimpleSequentialChain(chains=[chain_one, chain_two])
28
29
30
31
32 product = "Queen Size Sheet Set"
33 overall_simple_chain.run(product)
```

LangChain: Chains / SequentialChain





LangChain: Chains / SequentialChain

```
1  from langchain.chains import SequentialChain
2  from langchain.chat_models import ChatOpenAI
3  from langchain.prompts import ChatPromptTemplate
4  from langchain.chains import LLMChain
5  llm = ChatOpenAI(temperature=0, model="gpt-3.5-turbo")
```

```
6
7  # prompt template 1: translate to english
8  first_prompt = ChatPromptTemplate.from_template(
9      "Translate the following review to english: {Review}"
10 )
11 # chain 1: input= Review and output= English_Review
12 chain_one = LLMChain(llm=llm, prompt=first_prompt, output_key="English_Review")
```

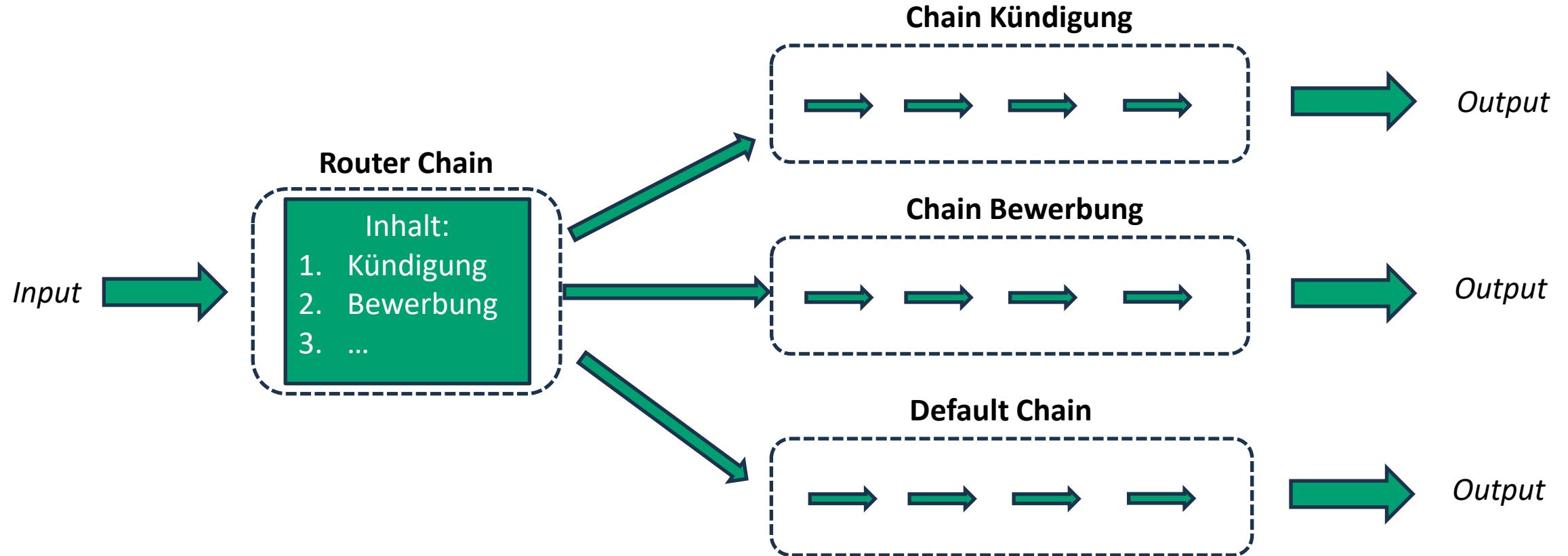
```
15 second_prompt = ChatPromptTemplate.from_template(
16     "Can you summarize the following review in 1 sentence: {English_Review}"
17 )
18 # chain 2: input= English_Review and output= summary
19 chain_two = LLMChain(llm=llm, prompt=second_prompt, output_key="summary")
```

```
21
22 # prompt template 3: translate to english
23 third_prompt = ChatPromptTemplate.from_template(
24     "What language is the following review: {Review}"
25 )
26 # chain 3: input= Review and output= language
27 chain_three = LLMChain(llm=llm, prompt=third_prompt, output_key="language")
```

```
29
30 # prompt template 4: follow up message
31 fourth_prompt = ChatPromptTemplate.from_template(
32     "Write a follow up response to the following summary in the specified language:"
33     "Summary: {summary} Language: {language}"
34 )
35 # chain 4: input= summary, language and output= followup_message
36 chain_four = LLMChain(llm=llm, prompt=fourth_prompt, output_key="followup_message")
```

```
38
39 # sequential_chain: input = Review and output = English_Review, summary, followup_message
40 sequential_chain = SequentialChain(
41     chains=[chain_one, chain_two, chain_three, chain_four],
42     input_variables=["Review"],
43     output_variables=["English_Review", "summary", "language", "followup_message"],
44 )
```

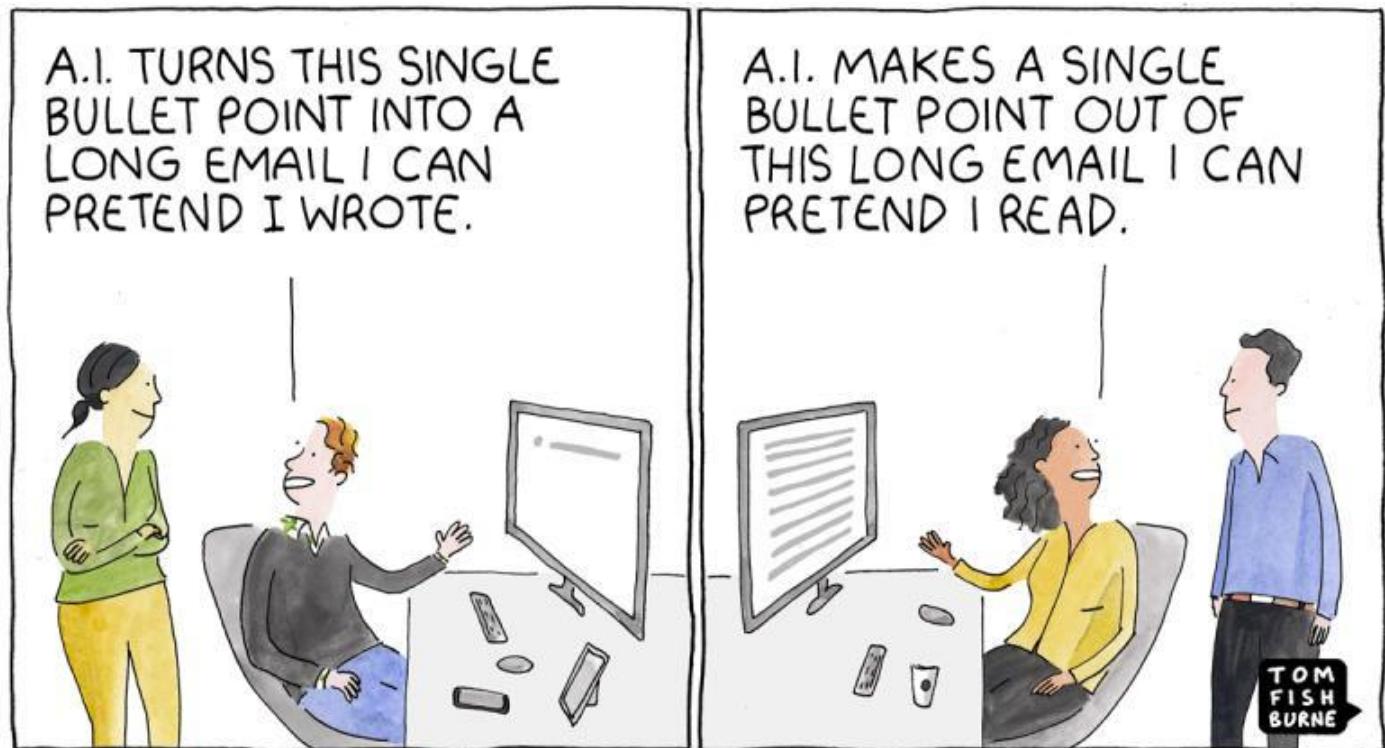
```
46
47 review = "..."
sequential_chain(review)
```



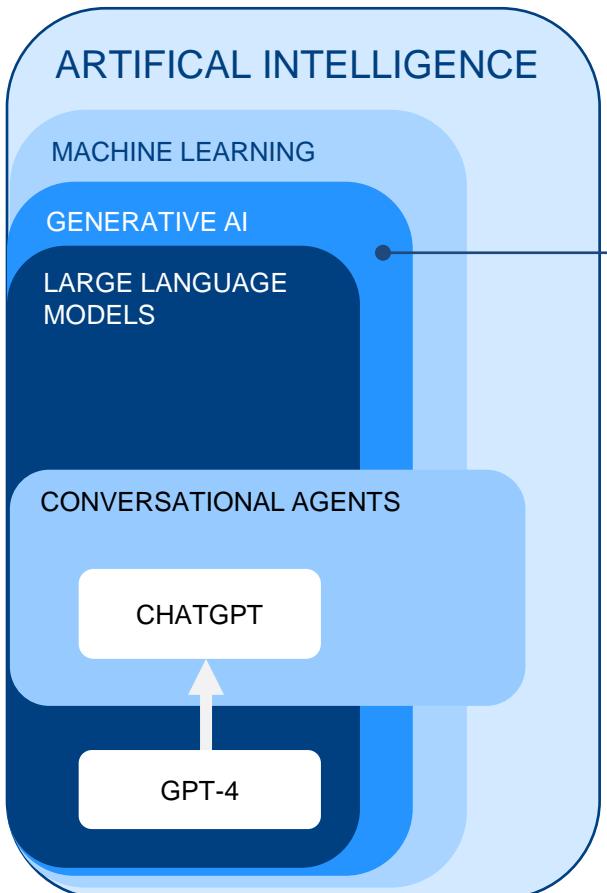
2

Anwendungsgebiete Generativer KI

Nicht alles ist Gold, was glänzt



Arten von KI

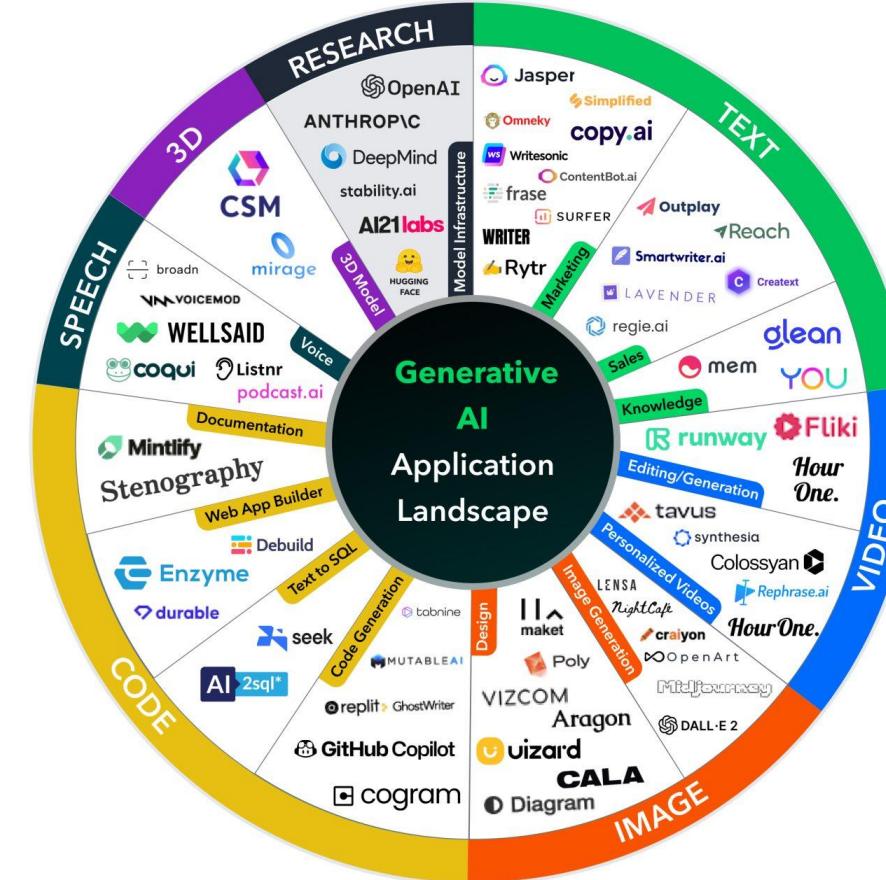


Generative AI companies with more than USD 5m funding

Segment / Modality	\$5 – 15MM	\$16 – 40MM	\$41 – 100M	\$100M+ Raised
Speech & Audio	krisp SecondNature WELLSAID ONEAL MURAI Amberscript skit Corti symbrai VOZY VOCEMOD Gospodol REPLICIA supertone	REPLICIA	AssemblyAI Speek descript usher DEEPNINJA AI Balto Elsen RIVERSIDE SPEECHUP	dialooid ASAPP OBSERVE-AI CRESTA replican PolyAI DEEPBRAIN
Text, Chat, & Translation	nlx Landbot copy.ai Certilyne LAVENDER Repilo personal.ai verbiage autobound Tymely mavenoid ultimate.ai WRITER contents regie.ai peppercontent agolo	mavenoid ultimate.ai WRITER contents regie.ai peppercontent agolo	DeepL Kasisto INSTORYD textio haptik	Jasper ada grammarly Forethought
Image, Visual, & Design	Simplifier moday PRISMA ART BLOCKS skippi reface VIZCOM Imagen PhotoRoom Facet uizard beautiful.ai Typeface tame Lighttricks	Typeface tame		
Video	Peach Rephrase.ai Product R GLOSSAI Waymark REMBRAND Colossyan VIEGO VEEDJO invideo Hour One Groin Twelve Labs synthesis D-ID VIDEOVERSE	VEEDJO invideo Hour One Groin Twelve Labs synthesis D-ID VIDEOVERSE		
3D, Simulation, & XR	Kinetix FABLE UNEEQ METAPHYSIC scenario CSM Mario rct.ai aletheia inworld soul machines	rct.ai aletheia inworld soul machines		
General Productivity	Prodigal SPIRITT ask-oi onloop viable FATHOM seek Perplexity Hebbio vectara nuclia Metaphor DASHWORKS mem xembly fireflies.ai xembly mem fireflies.ai	mem fireflies.ai xembly mem fireflies.ai	OIIH Otterai Sana Labs neeva YOU	
Search	seek nuclia Metaphor DASHWORKS Outplay Quattr Demandwell durable MarketMuse Dynamo10x The.com Latently TOPUNEPRO anyword unbounce MINTY PERSADO	Outplay Quattr Demandwell durable MarketMuse Dynamo10x The.com Latently TOPUNEPRO anyword unbounce MINTY PERSADO		
Marketing BI & Website Design	madgix Omnyx Outplay Quattr Demandwell durable MarketMuse Dynamo10x The.com Latently TOPUNEPRO tobinnu warp replit	tobinnu warp replit		
Code	anima bloop. anima bloop. warp replit			
Music	WOMBARI moises SPLASH JAM	SPLASH JAM		
Vertical Application	Valence SYNTIGRA Profluent Atomica.ai sorcer0 Antivirus ATROPOSHEALTH DAWINAI SWAPP TERM SCOUT TONAMI Archistar DATA SKRIVE CROWD TESTFIT EDUCATION REDESIGN SCIENCE ALPHABIO retrake ordbas abridge wyso BASECAMP RESEARCH Nobla pictorlabs IQEVIA Arzed ATOMIC AI HMDCLONE Page BigHot	retrake ordbas abridge wyso BASECAMP RESEARCH Nobla pictorlabs IQEVIA Arzed ATOMIC AI HMDCLONE Page BigHot	Generate Biomedicine Workbot Health Instio Medicine Envedx Environment MDCLONE Page BigHot	
	DARWINAI SWAPP TERM SCOUT TONAMI Archistar DATA SKRIVE CROWD TESTFIT EDUCATION REDESIGN SCIENCE ALPHABIO retrake ordbas abridge wyso BASECAMP RESEARCH Nobla pictorlabs IQEVIA Arzed ATOMIC AI HMDCLONE Page BigHot	CASETEXT REPLICIA MAD Primer		
ML Ops / Dev Tools	LatticeFlow featureform Pinecone mosaic JINA oporalia deepset Outerbounds comet Lightning ROBUST INTELLIGENCE anyscale OctoML run ai Hugging Face Weights & Biases	featureform Pinecone mosaic JINA oporalia deepset Outerbounds comet Lightning ROBUST INTELLIGENCE anyscale OctoML run ai Hugging Face Weights & Biases		
	MINTIUM Datomize lang.ai SatumCloud MOSTLY-AI Synthesis AI Diveplane hazy zilliz gretel TOMIC dotagen parallel domain generally intelligent AZ FOUNDATION AI21 labs runway ANTHROPIC A D E P T OpenAI Inflection cohere Character AI	zilliz gretel TOMIC dotagen parallel domain generally intelligent AZ FOUNDATION AI21 labs runway ANTHROPIC A D E P T OpenAI Inflection cohere Character AI		
Infra / Research / Model Develop.				

Kelvin Mu based on Pitchbook, Crunchbase and public sources, March 2023

Generative AI geht über die Erstellung von Text hinaus. Neue Produkte erweitern die Möglichkeiten stetig



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Just Launched

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Free from \$25/mo	Free + from \$4.99	No pricing
 Blue - ChatGPT fo... ChatGPT on Mac	 Senior AI Software development	 Coverse Task automation
Free + from \$5	Free + from \$44/mo	No pricing
 CustomGPT Chatbots	 Robopic Professional avatars	 Tess Design Image generation
Free + from \$89	No pricing	No pricing
 YC-GPT Startup advice	 MysticQuill LinkedIn posts	 Braintrust AIR Job recruitment
No pricing	Free from \$2/mo	No pricing

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SEO | Summaries | Chatbots | Music | Funny

Q Today | Most saved | Timeline | Get featured | Job Impact Index | Community | Subscribe |

Our favorites

SEO Writing AI | + SEO content | No pricing | 311 | 5 | 3.7

Voicy | + Song covers | No pricing | 660 | 18 | 2.9

Hoppy Copy | + Email marketing campaigns | No pricing | 79

#	Task	AIs
1	Content generation	272
2	Writing	210
3	ChatGPT	204
4	Chatting	171
5	Chatbots	162
6	Avatars	138
7	Document Q&A	127
8	SEO content	118
9	Customer support	118
10	Apps	110
11	Coding	99
12	Learning	94
13	Conversations	90
14	Data analytics	85
15	Video generation	84
16	Task automation	82

<https://theresanaiforthat.com/>



Wo Wissen beginnt

Fragen Sie etwas...



≡ Fokus + Anhängen



Pro



What's the meaning of al dente?



The best fishing spots in Canada



Are all mushrooms edible?



The history of film

ChatGPT-4.0: Weitere Features

GPTs

Discover and create custom versions of ChatGPT that combine instructions, extra knowledge, and any combination of skills.

Q Search GPTs

Top Picks DALL-E Writing Productivity Research & Analysis Programming Education Lifestyle

Featured

Curated top picks from this week



SciSpace

Do hours worth of research in minutes. Instantly access 200M+ papers, analyze papers at lightning...

By scispace.com



Code Guru

Reviews code, writes pull requests, generates and optimizes functions, writes tests, and comments...

By Ryan J Topps



Language Teacher | Ms. Smith

Supports 20+ languages - Spanish, German, French, English, Chinese, Korean, Japanese, ... Your private...

By tevfik.xyz



Wine Sommelier

Your Personal Wine Expert

By Joseph Moran

Trending

Most popular GPTs by our community

- | | | | | | |
|---|--|---|---|--|---|
| 1 | | image generator
A GPT specialized in generating and refining images with a mix of professional and friendly tone.
By NAIF J ALOTAIBI | 2 | | Write For Me
Write tailored, engaging content with a focus on quality, relevance and precise word count.
By puzzle.today |
| 3 | | Consensus
Your AI Research Assistant. Search 200M academic papers from Consensus, get science-based answers, and draft content...
By consensus.app | 4 | | Scholar GPT
Enhance research with 200M+ resources and built-in critical reading skills. Access Google Scholar, PubMed, JSTOR, Arxiv, an...
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Effortlessly design anything: presentations, logos, social media posts and more.
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By promptspellsmith.com |

See more

By ChatGPT

GPTs created by the ChatGPT team

- | | | | | | |
|---|--|--|---|--|---|
| 1 | | DALL-E
Let me turn your imagination into imagery.
By ChatGPT | 2 | | Data Analyst
Drop in any files and I can help analyze and visualize your data.
By ChatGPT |
| 3 | | Hot Mods
Let's modify your image into something really wild. Upload an image and let's go!
By ChatGPT | 4 | | Creative Writing Coach
I'm eager to read your work and give you feedback to improve your skills.
By ChatGPT |
| 5 | | Coloring Book Hero
Take any idea and turn it into whimsical coloring book pages.
By ChatGPT | 6 | | Planty
I'm Planty, your fun and friendly plant care assistant! Ask me how to best take care of your plants.
By ChatGPT |

See more

Abbildungen erstellen mit MidJourney

Midjourney

- Spezialisierung auf die Erstellung von KI-generierter Kunst

Was kann Midjourney?

- Textbefehle können in Bilder umgewandelt werden (Text-to-Picture)
- Verwendung von Bildbefehle zur Erzeugung von KI-Kunst (Picture-to-Text)

Prompt: a picture of four female astronauts in space, with a proud and happy look on their faces. Make it look like a pencil drawing.



Quelle: philipp-dach / MidJourney

<https://midjourney.com>

Abbildungen erstellen mit MidJourney

Use-Cases

- Grafiken zur Visualisierung von Inhalten
 - Visualisierung komplexer Informationen
 - Anreicherung von Text mit passenden Bildern
- “Aufpeppen” von Präsentationen
 - Verbesserung der visuellen Anziehungskraft
- Entwurf von Logos
 - Einheitliches und professionelles Logo-Design
 - Vorstellung des eigenen Teams durch visuelle Elemente
- Darstellung von Daten
 - Python, Matplotlib, Excel, R



<https://midjourney.com>

Abbildungen erstellen mit MidJourney

Output

Erzeuge ein Bild von "Starry Night" im Surrealismus-Stil. - @ABBA-Services (fast)

U1 U2 U3 U4

V1 V2 V3 V4

Variationen (V4)

Midjourney Bot ✓ BOT heute um 09:09 Uhr
Erzeuge ein Bild von "Starry Night" im Surrealismus-Stil. - Variations (Strong) by @ABBA-Services (fast)

U1 U2 U3 U4
V1 V2 V3 V4

Upscale (U3)

Erzeuge ein Bild von "Starry Night" im Surrealismus-Stil. - Image #3 @ABBA-Services

Vary (Strong) Vary (Subtle) Vary (Region) Upscale (2x) Upscale (4x)
 Zoom Out 2x Zoom Out 1.5x Custom Zoom

 Web

<https://midjourney.com>

Text to Image

Draw a photo-realistic image of a luminescent blue human brain. The background is black, with lines of program code shining blue.



Draw an image of a friendly, wise, humanoid robot tutor counseling a human student in a library.

Make both the robot and the student look a bit older. The student should be in his early twenties. The robot should look more mature, like an artificial professor.

I prefer the first of the two images given. Can you make it a widescreen format?

Image to Text



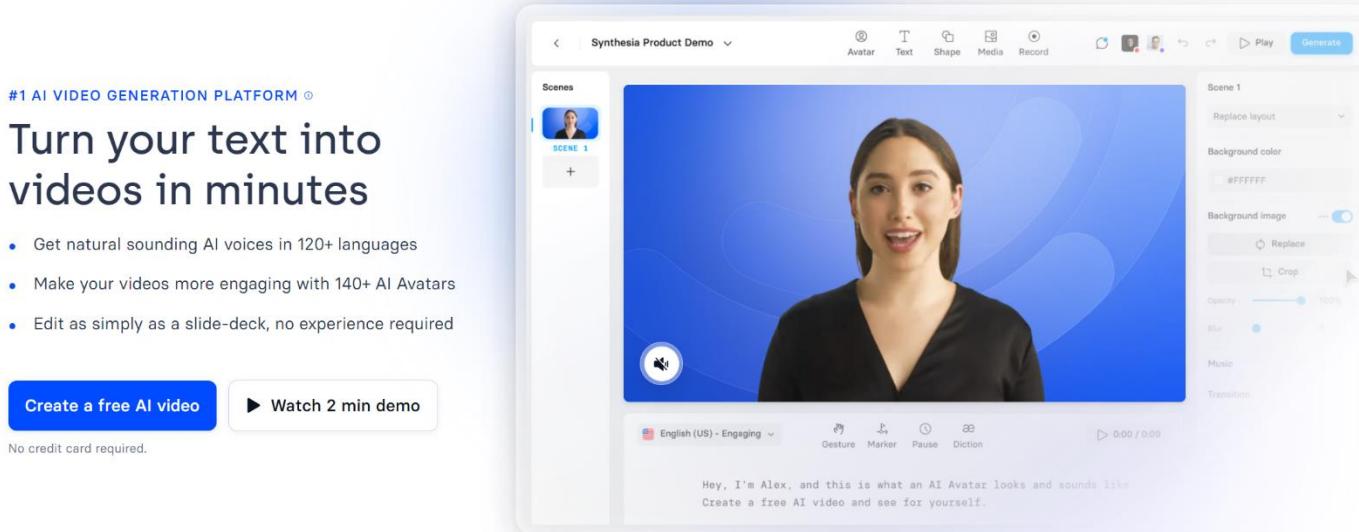
ChatGPT

The image shows a snow-covered slope leading up to a rocky mountain peak. The snow looks fresh with tufts of green vegetation poking through, suggesting that it might be late spring or early autumn when snowfall has recently occurred but has not yet covered the landscape entirely. The mountainside is steep and rugged, with sharp outcrops and some scattered greenery clinging to the crags. Above, the sky is partly cloudy with white clouds against a bright blue background, indicative of good weather. The perspective is from the base of the slope looking upwards, giving a sense of the mountain's scale and the challenging terrain.

OpenAI: Sora



Präsentationen halten (lassen) mit Synthesia



Synthesia

- Spezialisierung auf die Erstellung von KI-generierten Videos mit sprechenden Avataren
- Kurze Videos können kostenlos erstellt werden

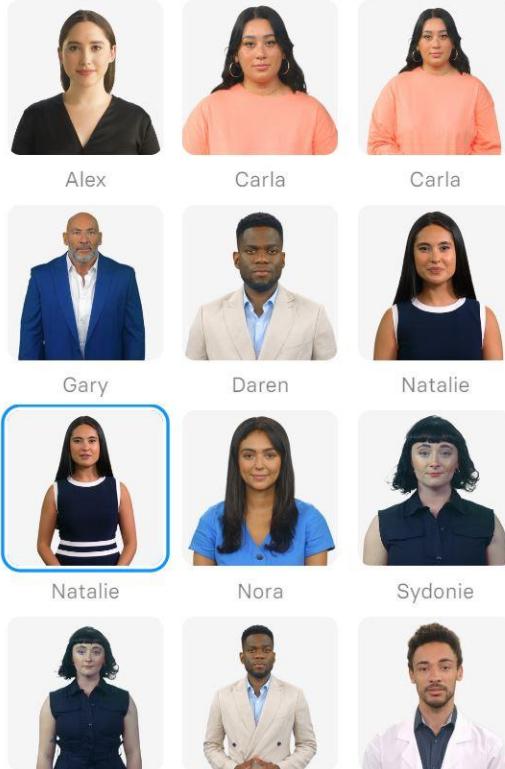
Was kann Synthesia?

- Text in gesprochene Sprache umwandeln
- Animierte, menschenähnliche Avatare
- Personalisierbare Avatare und Stimmen
- Videoerstellung für z.B. Präsentationen, Erklärvideos oder Werbeclips

<https://www.synthesia.io/>

Präsentationen halten (lassen) mit Synthesia

Auswahl an Avataren



Individualisierung des Backgrounds

<https://www.synthesia.io/>

Präsentationen halten (lassen) mit Synthesia



<https://www.synthesia.io/>

Coding: Frag' ein LLM

YZ

You

I have two bibliographies in bibtex format. Write a python code that accepts two files, reads both, and finds the single item that one file is missing.

ChatGPT

Sure! To accomplish this task in Python, you can use the `bibtxparser` library, which provides functionality to parse BibTeX files. The following Python script reads two BibTeX files, compares their entries, and identifies entries that are uniquely present in one file but not in the other. It assumes each BibTeX entry has a unique identifier.

Here's a Python script that does just that:

Here's a Python script that does just that:

```
python
import bibtxparser

def read_bibtex(file_path):
    with open(file_path, encoding='utf-8') as bibtex_file:
        bib_database = bibtxparser.load(bibtex_file)
    return bib_database

def find_unique_entries(bib1, bib2):
    # Extracting IDs from both bibliographies
    ids1 = {entry['ID'] for entry in bib1.entries}
    ids2 = {entry['ID'] for entry in bib2.entries}

    # Finding unique IDs
    unique_to_bib1 = ids1 - ids2
    unique_to_bib2 = ids2 - ids1

    # Collect entries that are unique to each bibliography
    unique_entries_bib1 = [entry for entry in bib1.entries if entry['ID'] in unique_to_bib1]
    unique_entries_bib2 = [entry for entry in bib2.entries if entry['ID'] in unique_to_bib2]

    return unique_entries_bib1, unique_entries_bib2

# Example file paths
file1 = 'path_to_bibtex1.bib'
file2 = 'path_to_bibtex2.bib'

# Read both files
bib1 = read_bibtex(file1)
bib2 = read_bibtex(file2)

# Find unique entries
unique_entries_bib1, unique_entries_bib2 = find_unique_entries(bib1, bib2)

print("Unique to File 1:", unique_entries_bib1)
print("Unique to File 2:", unique_entries_bib2)
```

Programmieren mit phind.com

In this code, the `compareTo()` method is used to sort the `arrToSort` array in alphabetical order delftstack.com.

3. Using a custom Comparator: If you need a more complex sorting logic, you can use a custom Comparator. Here is an example:

```
Arrays.sort(array, new CustomComparator());

public class CustomComparator implements Comparator<String> {
    private final Pattern pattern = Pattern.compile("(\\d+)\\s+(.*)");

    public int compare(String s1, String s2) {
        Matcher m1 = pattern.matcher(s1);
        if (!m1.matches()) {
            throw new IllegalArgumentException("s1 doesn't match: " + s1);
        }
        Matcher m2 = pattern.matcher(s2);
        if (!m2.matches()) {
            throw new IllegalArgumentException("s2 doesn't match: " + s2);
        }
        int i1 = Integer.parseInt(m1.group(1));
        int i2 = Integer.parseInt(m2.group(1));
        if (i1 < i2) {
            return 1;
        } else if (i1 > i2) {
            return -1;
        }
        return m1.group(2).compareTo(m2.group(2));
    }
}
```



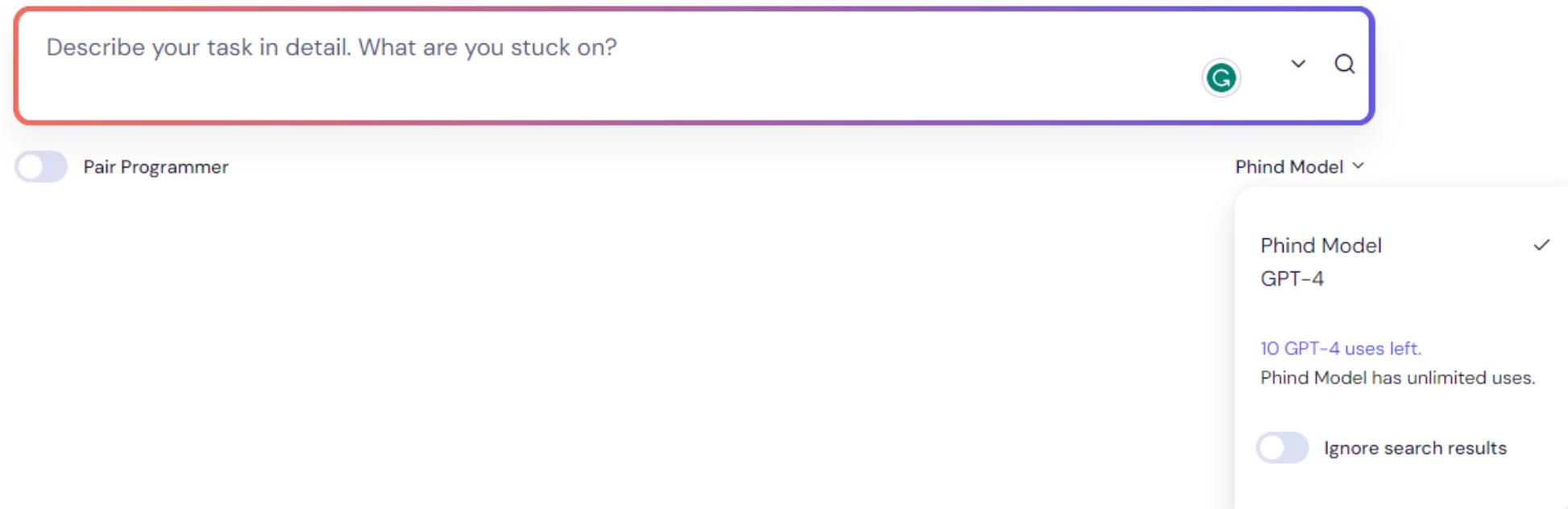
In this code, a custom Comparator is used to sort the `array` in a specific way stackoverflow.com.

Remember to choose the method that best fits your needs.



<https://www.phind.com/>

Your AI search engine and pair programmer.



GitHub CoPilot: Integrierter Coding Assistant

The world's most widely adopted AI developer tool.

Get started with Copilot >

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```
$ ghcs "How do I find all the files bigger than 128k?"  
Suggested command  
find . -size +128k  
? Select an option  
> Explain command  
  
Explanation  
find is used to list files.  
. specifies that we search in the current directory.  
-size +128k specifies that we only want files larger than 128k  
  
? Select an option [Use arrows to move, type to filter]  
> Copy command to clipboard  
Explain command  
Execute command  
Revise command
```

Keep flying with your favorite editor.

- VS Code
- Neovim
- Visual Studio
- JetBrains IDEs

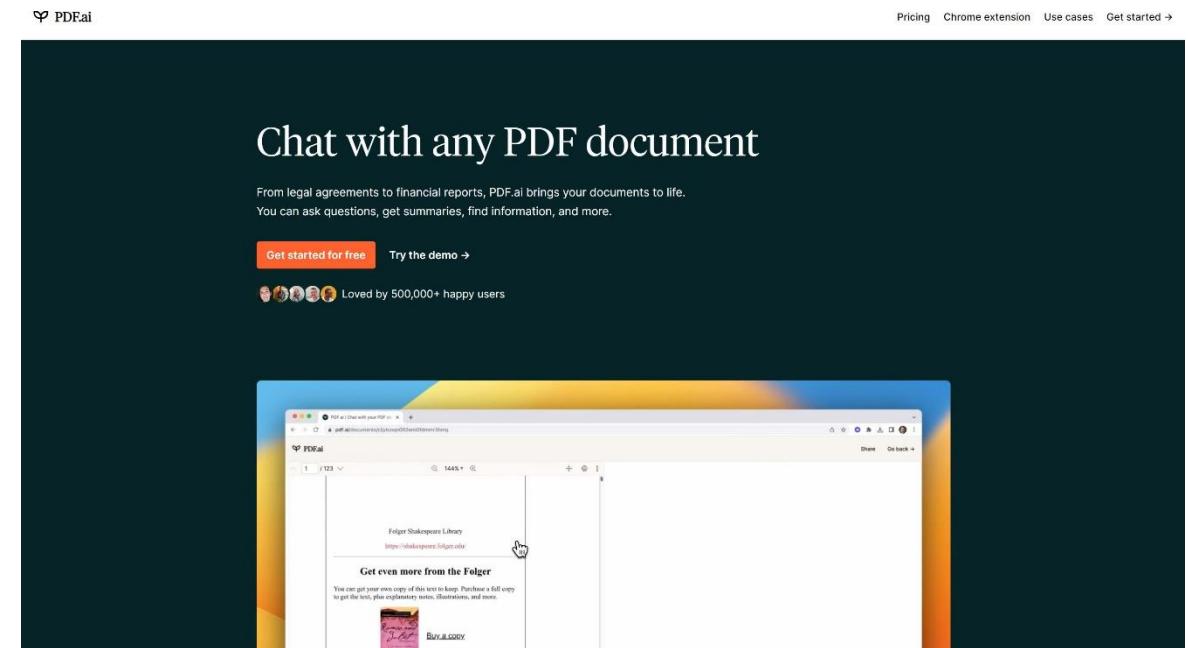
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- Benutzer können einen Dialog mit einer PDF-Datei führen
- Möglichkeit zur Integration von Büchern, Forschungsarbeiten, Artikeln, juristische Dokumente usw. in PDF-Form

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- Interaktion mit PDF-Dokumenten via Chatfunktion
- Zeitersparnis beim Schreiben von Notizen oder Zusammenfassungen



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The screenshot shows a split-screen view of a research paper. The left side displays the full PDF document with a header, author information, abstract, and introduction. The right side is a summary interface with sections for 'Overview' and 'Key points'.

PDF.ai

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Nudging towards Sustainable Choices in Online Grocery Stores

Digital Nudging in Online Grocery Stores – Towards Ecologically Sustainable Nutrition
Completed Research Paper

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Abstract

A major driver of global environmental challenges is our current food system. More sustainable practices on the supply side depend on pressure from the demand side: Every individual can contribute to a greener food system by making sustainable food choices. Digital nudging represents a promising approach to foster desirable consumer behavior. Research in the growing online food context is scarce and lacks a comparative analysis of digital nudging elements and their effectiveness regarding different consumer groups. We transferred three nudging elements to the digital choice environment of an online grocery store and conducted a field experiment with 291 participants. Parametric, nonparametric, regression, and cluster analyses showed that default rules are effective for a broad consumer base and simplification for environmentally-conscious consumers to promote ecologically sustainable behavior, while social norms had no effect. The results inform research and practice regarding the potential of digital nudging to foster ecologically sustainable food choices.

Keywords: Digital nudging, green IS, ecological sustainability, food system, consumer behavior, green society, online grocery store

Introduction

Environmental deterioration has become one of the biggest concerns of our times (Plumer and Popovic, 2018). Its severe threat is acknowledged and battled in worldwide cooperation and can be observed, for example, in the sustainable development goals proposed by the United Nations (2015). Most of the environmental deterioration is human-induced, meaning that we ourselves are damaging our basis of existence (Dunlap et al. 2000; Schubert 2017; Schultz et al. 2005). Information Systems (IS) is seen as an important weapon to address this challenge (Melville 2011) due to its remarkable influence and

Summarize the paper in five sentences

Overview

This paper presents a field experiment conducted to investigate the impact of nudging on sustainable food choices in online grocery stores. The experiment involved participants imagining a scenario where they needed to order ingredients online for a specific recipe. Participants were provided with incentives and were nudged towards environmentally-friendly choices through default rules, simplification, and social norms. The results showed that nudging had a significant positive effect on sustainable shopping behavior, particularly among environmentally-conscious participants. The study highlights the potential of nudging as a strategy to promote sustainable food consumption.

Key points

- The field experiment aimed to examine the impact of nudging on sustainable food choices in online grocery stores.
- Participants were asked to imagine a scenario where they needed to order ingredients online for a specific recipe.
- Nudging techniques, including default rules, simplification, and social norms, were implemented to encourage environmentally-friendly choices.
- The results showed that nudging had a significant positive effect on sustainable shopping behavior, particularly among environmentally-conscious participants.
- The study suggests that nudging can be an effective strategy to promote sustainable food consumption in online

p. 1 p. 14

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Process_Mining_Discovery_and_Integration_using_Distance_Measures.pdf

dependency between any node of g_{II} and node A_k . Similarly, node A_k is added in NM_{II} . Now NM_{II} and NM_{I2} have the same row names and column names: A_1 through A_{11} . We can use NM_{II} and NM_{I2} to compare g_{II} and g_{I2} .

NM_{II}	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_{10}	A_{11}
A_1	0	1	0	0	0	0	0	0	0	0	0
A_2	0	0	1	1	0	0	0	0	0	0	0
A_3	0	0	0	0	1	1	1	0	0	0	0
A_4	0	0	0	0	0	0	0	0	0	1	0
A_5	0	0	0	0	0	0	0	1	0	0	0
A_6	0	0	0	0	0	0	0	0	1	0	0
A_7	0	0	0	0	0	0	0	1	0	0	0
A_8	0	0	0	0	0	0	0	0	0	1	0
A_9	0	0	0	0	0	0	0	0	0	0	1
A_{10}	0	0	0	0	0	0	0	0	0	0	1
A_{11}	0	0	0	0	0	0	0	0	0	0	0

(a) NM_{II}

NM_{I2}	A_1	A_2	A_3	A_4	A_5	A_6	A_7	A_8	A_9	A_{10}	A_{11}
A_1	0	1	0	0	0	0	0	0	0	0	0
A_2	0	0	1	1	0	0	0	0	0	0	0
A_3	0	0	0	0	1	0	1	0	0	0	0
A_4	0	0	0	0	0	0	0	1	0	0	0
A_5	0	0	0	0	0	0	0	0	0	1	0
A_6	0	0	0	0	0	0	0	0	0	0	1
A_7	0	0	0	0	0	0	0	1	0	0	0
A_8	0	0	0	0	0	0	0	0	0	1	0
A_9	0	0	0	0	0	0	0	0	0	0	1
A_{10}	0	0	0	0	0	0	0	0	0	0	1
A_{11}	0	0	0	0	0	0	0	0	0	0	0

(b) NM_{I2}

Fig. 7 An example of comparison matrices

The algorithm for construction of normalized process matrices consists of three steps. First, we must determine whether or not DG_i and DG_j are δ -comparable for the given δ value. Second, we compute the size of the normalized NM by $m = |DN_i \cup DN_j|$ and label nodes in $\{DN_i \cup DN_j\}$ as $\{A_1, A_2, \dots, A_m\}$ using a uniform naming scheme. Third, we create the matrix data structures for DG_i and DG_j : $NM_{i,j}$ and $NM_{j,i}$, where $i, j = 1, 2, \dots, m$, and assign a value of 1 or 0 to each element in the two normalized matrices.

4.2 Distance-based Process Similarity Measures

With the concept of a normalized matrix, we now transform the problem of comparing two processes into the problem of computing the distance-based similarity of the two normalized process matrices. One obvious idea is to compute the distance of the two normalized matrices using matrix subtraction.

Zum Beenden des Vollbildmodus F11 drucken

Welcome to this informative PDF file on Process Mining, Discovery, and Integration using Distance Measures! In this paper, we present a quantitative approach to modeling and capturing the similarity and dissimilarity between different process designs. By analyzing the process dependency graphs of the participating workflow processes, we derive similarity measures that can be used as a tool in process mining, process merging, and process clustering. Ultimately, this approach can reduce or minimize the costs involved in design, analysis, and evolution of workflow systems.

Example questions:

- ▷ How does the approach presented in this paper differ from other methods of process mining and integration?
- ▷ Can this distance measure be applied to processes in industries outside of service-oriented enterprise computing systems?
- ▷ How can this approach be used to improve the efficiency and effectiveness of workflow systems in an organization?

What is the contribution of this paper? Answer in at most two sentences.

This paper presents a quantitative approach to modeling and capturing the similarity and dissimilarity between different process designs using distance measures derived from process dependency graphs, which can be used as a tool in process mining, process merging, and process clustering to reduce or minimize the costs involved in design, analysis, and evolution of workflow systems.

What distance measures do the authors use in this paper?

The authors derive similarity measures by analyzing the process dependency graphs of the participating workflow processes and calculate the metric space distance between the normalized matrices.

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For each answer, ChatPDF can look at only a few paragraphs from the PDF at once. These paragraphs are the most related to the question. ChatPDF might say it can't see the whole PDF or mention just a few pages because it can view only paragraphs from those pages for the current question.

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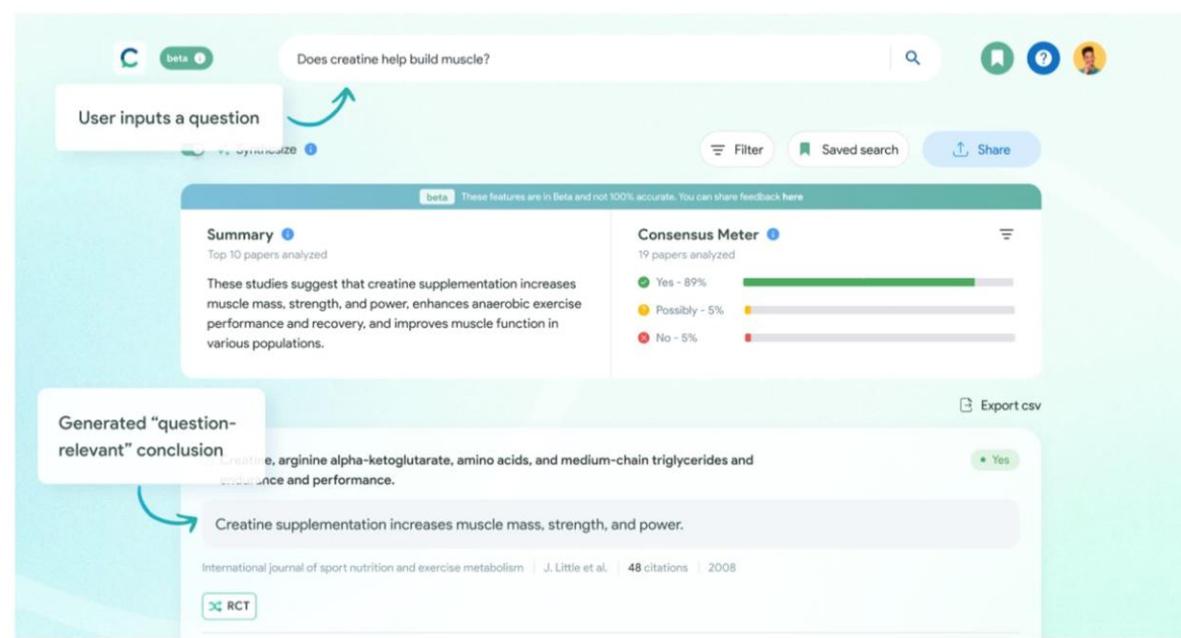
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<https://www.chatpdf.com/>

What does Consensus search over?

200M+ Research Papers

The current source material used in Consensus comes from the [Semantic Scholar](#) database, which includes over 200M papers across all domains of science. We continue to add more data over time and our dataset is updated monthly.



How should I format my search query?

Here are some examples below, you can also check out our help article: [How to Search](#)

- Try single-word searches to start learning about a subject or topic: *Avocados* or *Cancer*.
- See how two concepts relate to each other: *Magnesium & Sleep* or *Vitamin C & colds* or *Impact of climate change on GDP*
- Ask 'Yes' or 'No' type questions: *Does lack of sleep increase Alzheimer's risk?*
- Add an instruction for Copilot with your search: *Does immigration improve local economies? Group together pro and con cases*

How does a Consensus search work?

We run a custom fine-tuned language model over our entire corpus of research papers and extract the Key Takeaway from every paper. We then remove things like 'what', 'is', and 'are' from the query and run a combination of keyword search + [Vector search](#) over the abstract and title of all our papers. This gives us a very intelligent measure of the relevance of a research paper to your query.

How are results & their relevance determined?

This relevance score is then combined with many other pieces of metadata including but not limited to citation count, velocity of citations, study design, and publish date to re-rank the results and produce a top 20 possible results to surface.

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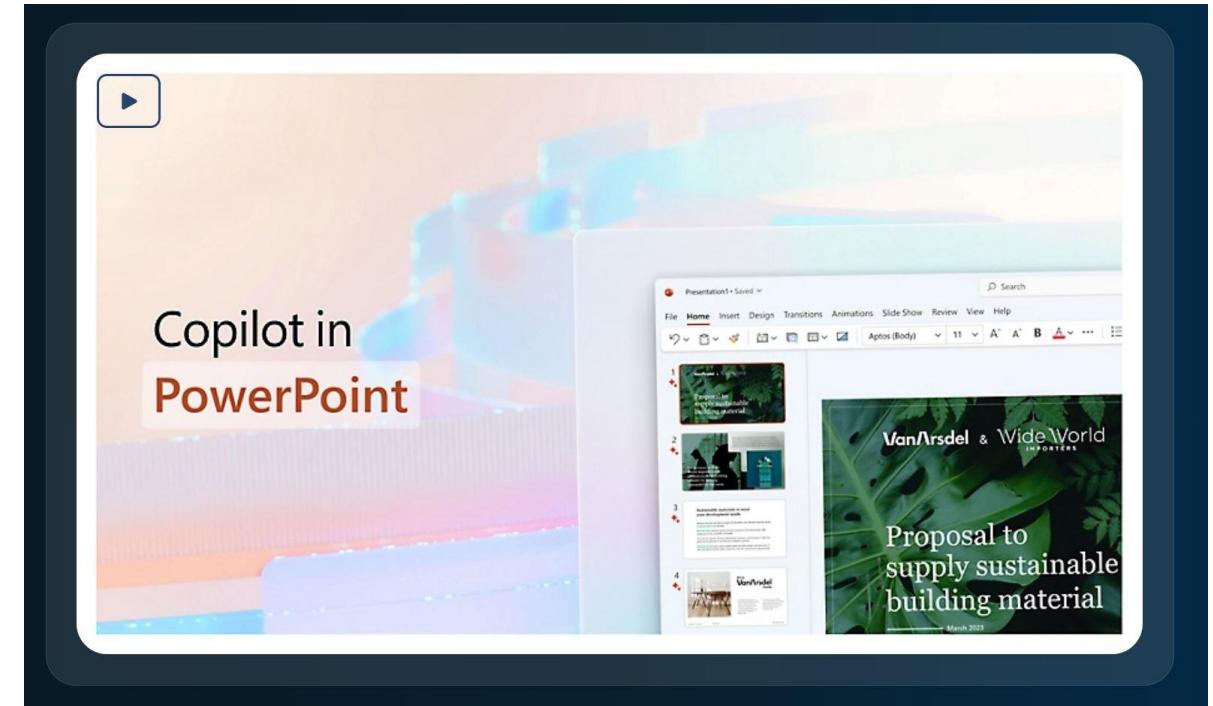


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**FIGURE 01 + OPENAI
SPEECH-TO-SPEECH REASONING**

