

Introducing  
ChatGPT Plus



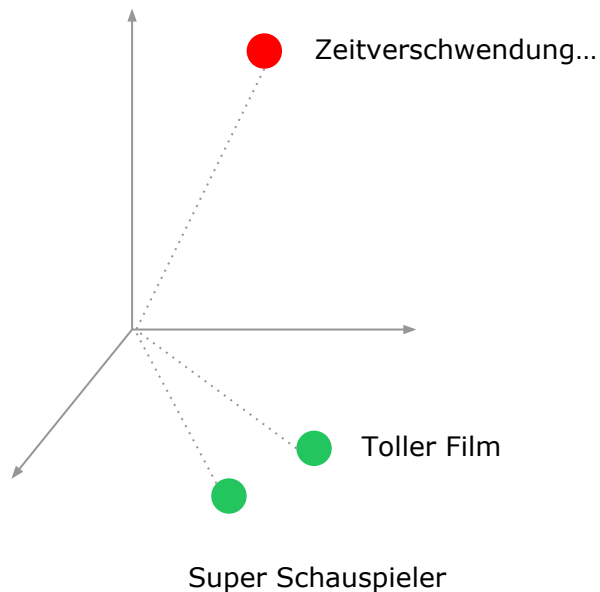
- openHPI: ChatGPT: Was bedeutet generative KI für unsere Gesellschaft? -

# Prompt Engineering und Vektor Datenbanken

Johannes Hötter  
Christian Warmuth

## Recap

# Stärke von Deep Learning: Repräsentationen lernen



“Toller Film” und “Super Schauspieler” haben nur unterschiedliche Wörter.

Deep Learning erkennt sie dennoch als ähnliche Sätze

# Anweisungen im Prompt Engineering

The screenshot shows the OpenAI Playground interface. At the top, there's a navigation bar with 'Overview' and 'Documentation' links. The main area is titled 'Playground'. A red box highlights the prompt 'Tell me a funny story in which a dog is the main character'. Below the prompt, the generated response is displayed in green text. The response is a story about a mischievous dog named Fido who sneaks into his neighbor's house to steal food. The story is divided into four paragraphs. On the right side, there are settings for the generation, including 'Mode' (Complete), 'Model' (text-davinci-003), 'Temperature' (0.7), 'Maximum length' (256), 'Stop sequences', 'Top P' (1), 'Frequency penalty' (0), 'Presence penalty' (0), and 'Best of' (1). At the bottom, there's a 'Submit' button and a 'Looking for ChatGPT? Try it now' link.

platform.openai.com/playground

Overview Documentation

Playground

Funny story

Load a preset...

Save View code Share ...

Tell me a funny story in which a dog is the main character

Once upon a time, there lived a very mischievous dog named Fido. Fido loved to cause trouble, and one day he decided to try to sneak into the neighbor's house.

Fido managed to sneak in without anyone noticing, and he quickly went to work. He started to search through all the drawers and cabinets looking for something to eat.

Suddenly, Fido heard a loud noise coming from the kitchen. He quickly ran to the kitchen to investigate, only to find the neighbor's cat had knocked a plate of food onto the floor. Fido and the cat both started eating the food, and when the neighbor returned home, he was very surprised to find Fido and the cat happily enjoying their banquet.

The neighbor was not too pleased with Fido's antics, but he couldn't help but laugh at the sight of the two animals happily eating from the same plate. From then on, Fido and the cat were the best of friends!

Mode: Complete

Model: text-davinci-003

Temperature: 0.7

Maximum length: 256

Stop sequences: Enter sequence and press Tab

Top P: 1

Frequency penalty: 0

Presence penalty: 0

Best of: 1

Inject start text

Submit

Looking for ChatGPT? Try it now

# Anweisungen im Prompt Engineering

The screenshot shows the OpenAI Playground interface at [platform.openai.com/playground](https://platform.openai.com/playground). The prompt is "Tell me a sad story in which a grandparent dies". The generated response is a sad story about a grandmother. A red box highlights the prompt, and a red box highlights the word "Sad" in the title "Sad story".

**Sad story**

Tell me a sad story in which a grandparent dies

An elderly grandmother had lived an amazing life, filled with love and laughter. She was the matriarch of her family, and her children and grandchildren held her closest to their hearts.

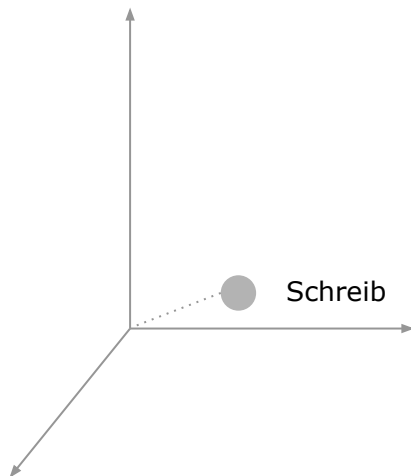
One day, the grandmother became ill and was taken to the hospital. Despite the best efforts of the doctors and nurses, the grandmother's health began to decline. Soon, the family was forced to accept the inevitable and say their goodbyes.

The grandmother passed away peacefully surrounded by her family. Even though the family was sad and grieving, they were also filled with gratitude and appreciation for the life that the grandmother had shared with them. They all remembered her fondly and celebrated her life with a memorial service.

The family was forever changed by the loss of their beloved grandmother, but they kept her spirit alive in their hearts and minds. She was a beloved part of the family who will never be forgotten.

Looking for ChatGPT? [Try it now](#)

# Prompt Engineering gibt die Regionen vor, in denen wir uns bewegen sollen



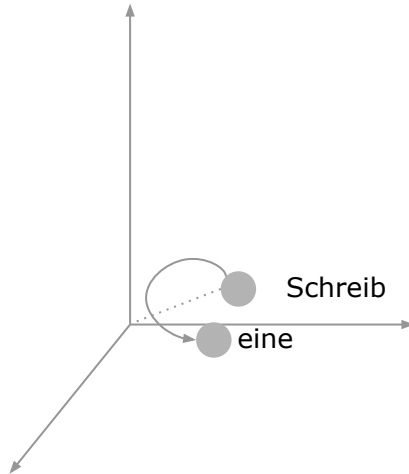
Schreib eine [witzige/traurige]  
Geschichte, in der ...

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# Prompt Engineering gibt die Regionen vor, in denen wir uns bewegen sollen



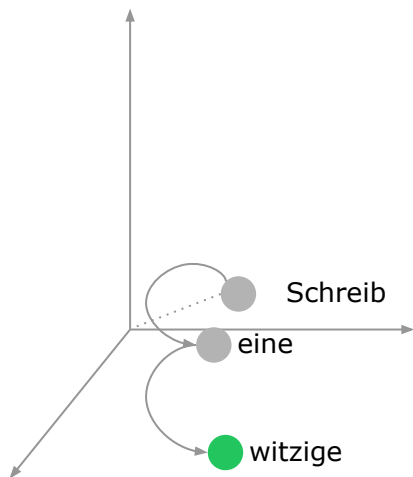
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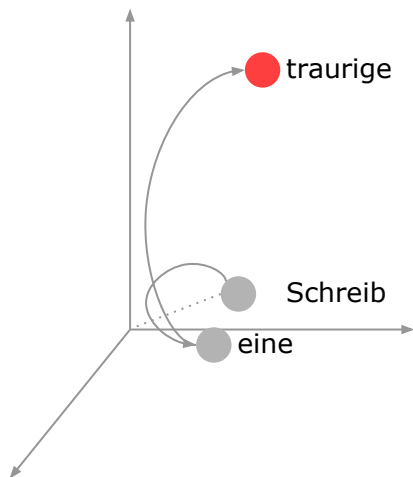
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Schreib eine [witzige/traurige]  
Geschichte, in der ...

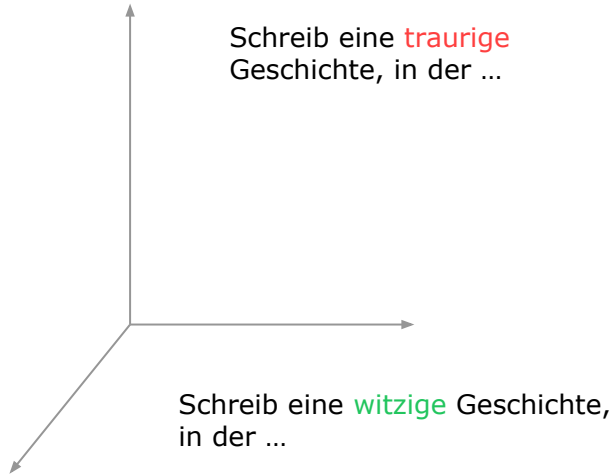
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# Prompt Engineering = Kontext, Kontext, Kontext

## Modelle:

- “Large language Models” (z.B. ChatGPT) haben das Ziel, ein Weltwissen zu erlernen. Etwa:
  - Wenn die Sonne scheint
  - Und es gleichzeitig regnet
  - Dann gibt es einen Regenbogen

## Kontext:

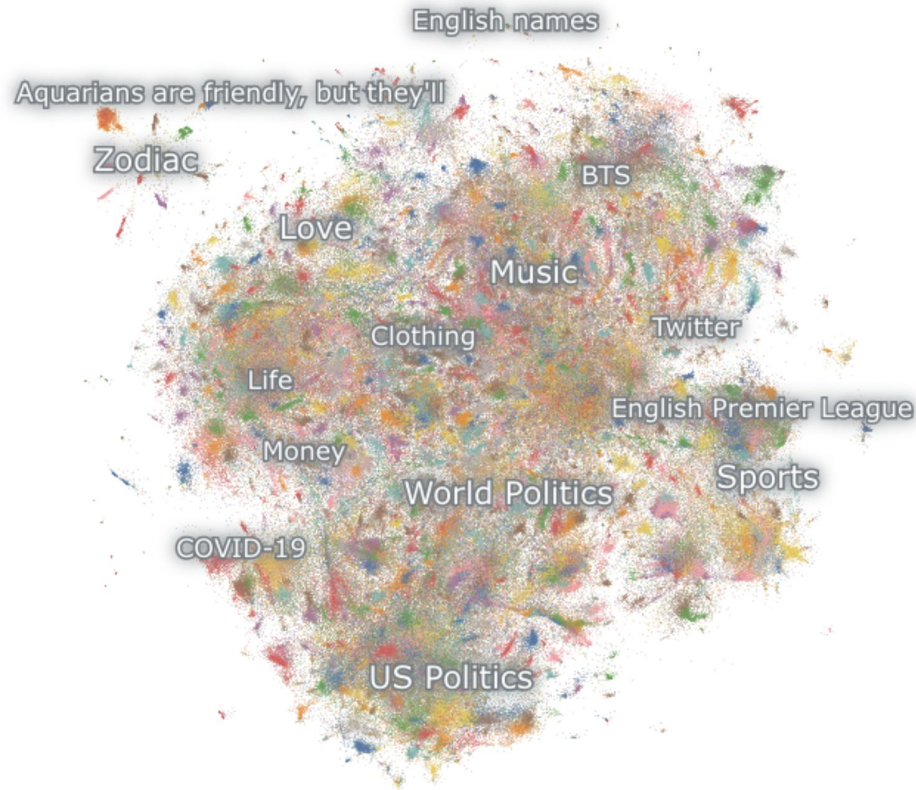
- Z.B. Details in der Anweisung (witzige/traurige Geschichte)
- Wissen, welches ggfs. nicht in den Trainingsdaten vorkommt (z.B. aktuelle News oder Produktinformationen) -> **Woche 2**

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# Vektordatenbanken

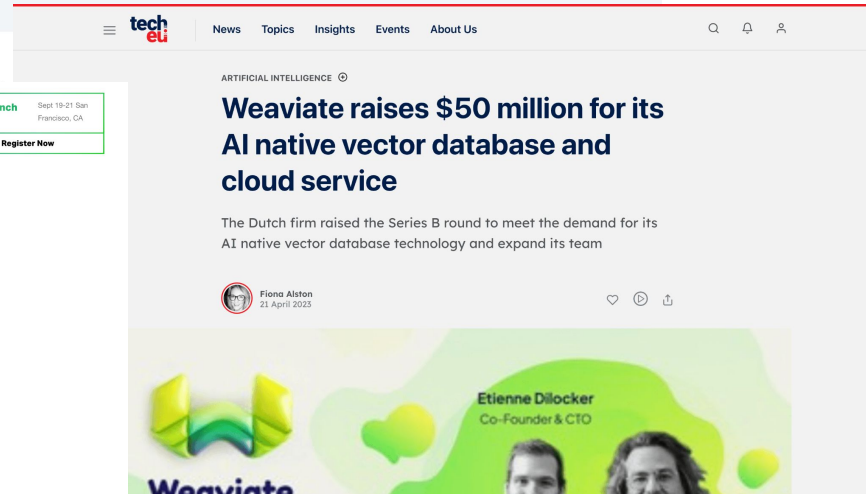
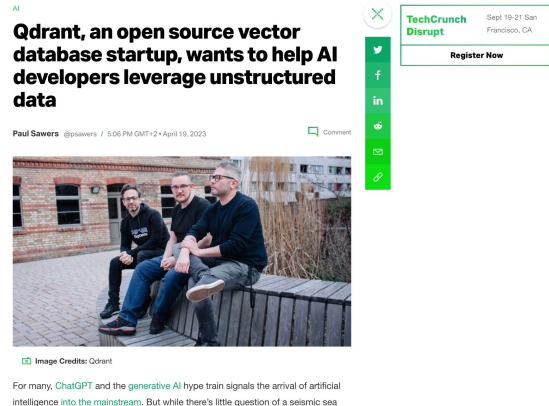
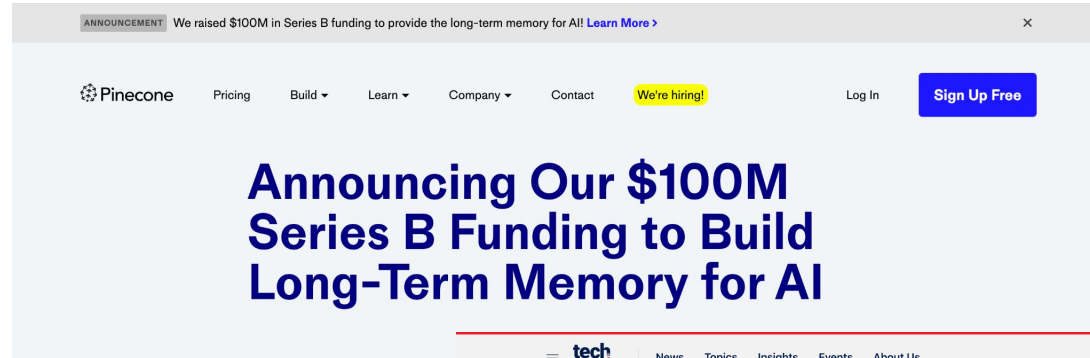


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# Vektordatenbanken - das Thema der Stunde



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# Vektordatenbanken vs. relationale Datenbanken

## Kundendaten

Name	Alter	Lieblingsbuch
John Doe	29	Der Hobbit
Jane Doe	26	Harry Potter 1

```
SELECT Alter  
FROM Kundendaten  
WHERE Lieblingsbuch = 'Der Hobbit'
```

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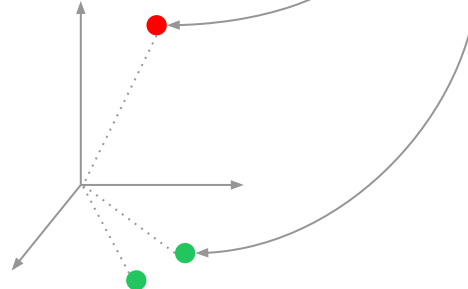
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# Vektordatenbanken vs. relationale Datenbanken

## Filmbewertungen

Paragraph	Vektor
Ich liebe den Film! Wirklich tolle Schauspieler, grandiose Wendung, und jederzeit spannend.	[0.12412, -0.59215, ...]
Was eine reine Zeitverschwendung...	[-0.48235, 0.24215, ...]



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# Viele Wege führen nach Rom

```
import numpy as np

# generate some sample vectors
vectors = np.array([
    [1, 2, 3],
    [4, 5, 6],
    [7, 8, 9]
])

# define the query vector
query = np.array([2, 4, 6])

# compute the Euclidean distances between the query and all vectors
distances = np.linalg.norm(vectors - query, axis=1)

# find the index of the vector with the smallest distance
min_index = np.argmin(distances)

# print the closest vector and its distance
print("Closest vector:", vectors[min_index])
print("Distance:", distances[min_index])
```

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# Viele Wege führen nach Rom

☰ README.md

You can also install it with [Docker](#), [Homebrew](#), [PGXN](#), [Yum](#), or [conda-forge](#)

## Getting Started

Create a vector column with 3 dimensions

```
CREATE TABLE items (id bigserial PRIMARY KEY, embedding vector(3));
```

Insert vectors

```
INSERT INTO items (embedding) VALUES ('[1,2,3]'), ('[4,5,6]');
```

Get the nearest neighbors by L2 distance

```
SELECT * FROM items ORDER BY embedding <=> '[3,1,2]' LIMIT 5;
```

Also supports inner product (<#>) and cosine distance (<cos>)

Hier gezeigt: <https://github.com/pgvector/pgvector>



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# Kontext, Kontext, Kontext

**Weltwissen  
(z.B. ChatGPT)**

+

**Domänenwissen  
(z.B. eigene Daten)**

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## Recap

# Verschiedene Wege der Umsetzung generativer KI

## Prompt Engineering

### Kontext mitliefern

**Informationen** werden im Kontext (Prompt) mitgeben um bessere Ergebnisse zu erhalten (z.B. via Vektordatenbank)

### In-Context Learning

**Beispiele** im Kontext (Prompt) mitgeben, um bessere Ergebnisse zu erhalten.  
Synonym: **Few-Shot Prompting**

### Fine Tuning

**Beispiele** werden verwendet für das Finetuning. Das Modell wird verändert und verbessert.  
Wichtig: Rechenaufwand bzw. Kosten entstehen.

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# In-Context Learning/Few Shot Prompting

## Zero Shot Prompting

**Klassifiziere diese  
Nachricht in positiv  
oder negativ:**

“Ich liebe dieses Buch”

## Few Shot Prompting

**Klassifiziere diese  
Nachricht in positiv  
oder negativ:**

**Beispiele:**

“Ich finde das Buch  
super!”: positiv  
“Ich find das echt blöd”:  
negativ

“Ich liebe dieses Buch”

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# Ausblick Woche 2



**HPI Hasso Plattner Institut**  
Digital Engineering · Universität Potsdam

**KI Service Zentrum**  
by Hasso-Plattner-Institut

gefördert von  
**Bundesministerium für Bildung und Forschung**

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## Conversational AI

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## Prompt Engineering in der Praxis

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