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CHAI  
Humanities-Centered AI

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# Build your own chatbot

# Potential Issues with LLMs

- Data is out of date

# Potential Issues with LLMs

Modell ⓘ

GPT 3.5 Turbo GPT 4 Turbo

Ich

Who is the current king or queen of Great Britain?

KI

The current monarch of the United Kingdom is Queen Elizabeth II. She has been queen since 1952, following the death of her father, King George VI.



# Potential Issues with LLMs

- Data is out of date
- Does not have special knowledge

# Potential Issues with LLMs

## Modell

GPT 3.5 Turbo GPT 4 Turbo

Ich

Who is Baiben Zhang?

KI

I'm sorry, but I don't have any information about someone named Baiben Zhang. It's possible that this person may not be well-known or associated with the University of Hamburg. If you have any other questions or need assistance related to the university or any other topic, feel free to ask!



# Potential Issues with LLMs

- Data is out of date
- Does not have special knowledge
- Can “hallucinate”\*

\* <https://www.forbes.com/sites/mollybohannon/2023/06/08/lawyer-used-chatgpt-in-court-and-cited-fake-cases-a-judge-is-considering-sanctions/?sh=3fd97317c7f3>

# Potential Issues with LLMs

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# Potential Issues with LLMs



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GPT 3.5 Turbo GPT 4 Turbo



Who is the current king or queen of Great Britain?



The current monarch of the United Kingdom is Queen Elizabeth II. She has been queen since 1952, following the death of her father, King George VI.



What is the source of that information?



# Potential Issues with LLMs

- Data is out of date
- Does not have special knowledge
- Can “hallucinate”
- No citations
- **LACK OF TRUST**

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Image source: <https://imgur.com/GI6POZG>

# Potential Issues with LLMs

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Image source: <https://imgur.com/GI6POZG>, ChatGPT Logo: <https://chat.openai.com/favicon-32x32.png>



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# Retrieval Augmented Generation (RAG)

# RAG

- “poor man’s fine-tuning”
- Idea: provide context to LLM
- Problem: limited context window
- Solution: only provide contextually relevant information as context
- How do we only get contextually relevant information?

# RAG

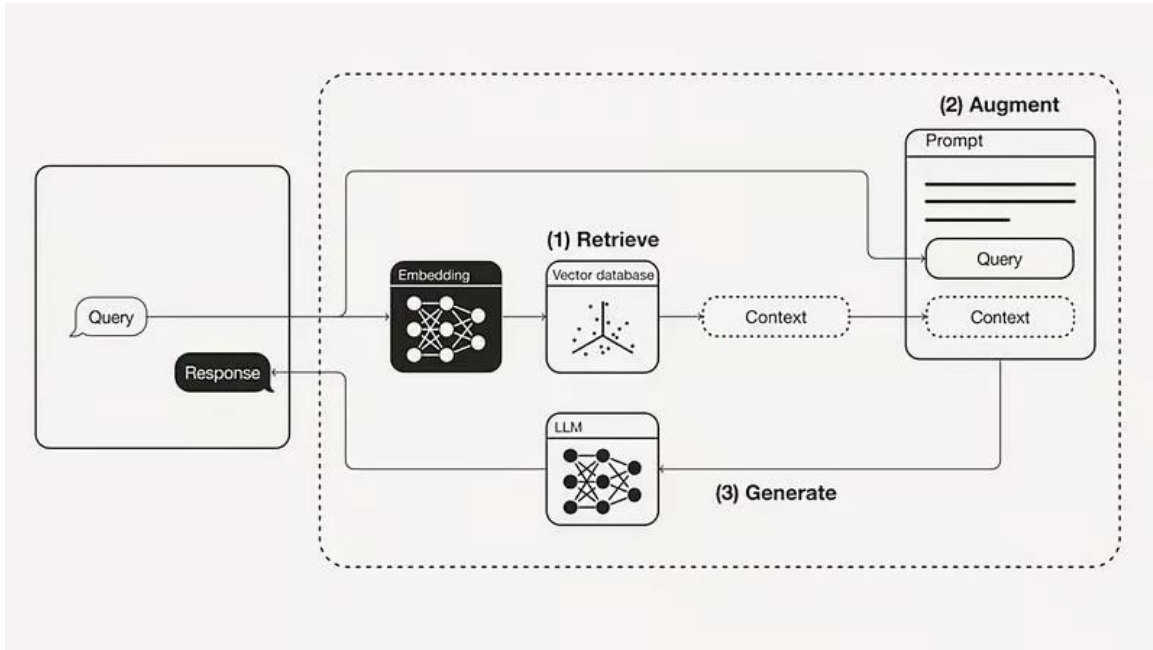


Image source:  
<https://dev.to/maximsaplin/gpt-4-128k-context-it-is-not-big-enough-1h02>

# Word Embeddings

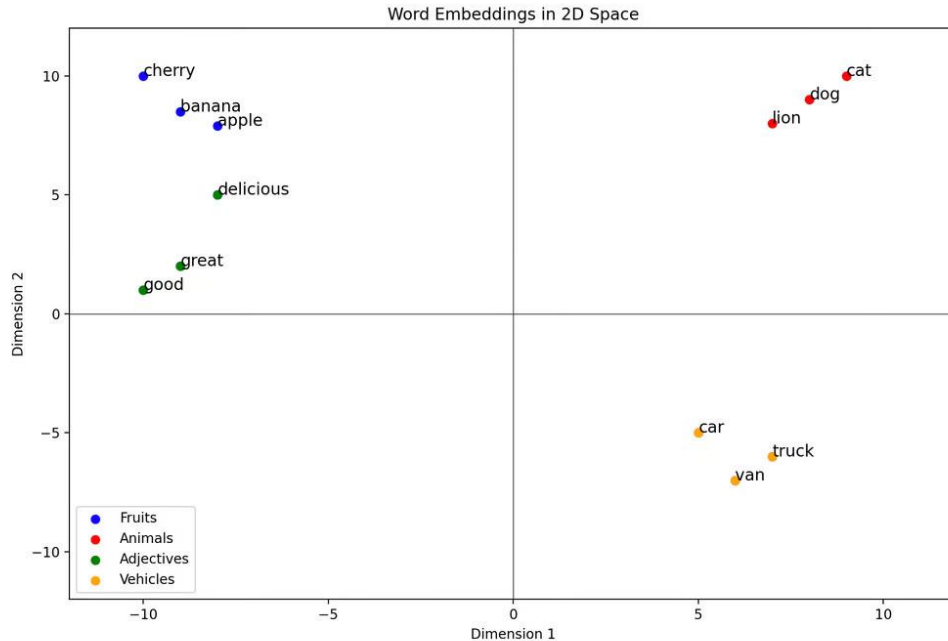


Image source:

<https://realpython.com/chromadb-vector-database/#represent-data-as-vectors>

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# In-context Learning



# In-context Learning

- Adaptation to new task using examples
  - “Translate into German: cheese – Käse, apple – Apfel, dog – “
- No update on model itself
  - Unlike in Fine-tuning
- Not clear how exactly it works
- Efficient