ChatGPT: a use case to query Elasticsearch using natural language in PHP

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Summary

- ChatGPT
- Using ChatGPT to generate PHP code
- Elasticsearch DSL query
- Use natural language to query Elasticsearch
- Putting it all together: Elasticsearch client + ChatGPT
- An experimental library elasticsearch-chatgpt-php
- References

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ChatGPT

- ChatGPT is a Large Language Model (LLM) developed by OpenAI
- It's a chatbot that uses natural language for answering to general questions (using a prompt)
- It acts like an "intelligent agent"
- It's a generative pre-trained transformer (GPT) + reinforcement learning from human feedback (RLHF)
- The cost of training GPT-4 was more than $100 million

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Generate PHP code with ChatGPT

DEMO

https://chat.openai.com/

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Elasticsearch DSL

- Elasticsearch provides a full [Query DSL](#) (Domain Specific Language) based on JSON to define queries
- The Query DSL can be invoked using most of **search APIs**
- Include a "query" element in your search body and populate it with a query built using the DSL
- Example:
  - **{ "query": { "match": { "my_field": "meaning" } } }**

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Example of query and filter contexts

```
GET /_search
{
  "query": {  (1)
    "bool": {  (2)
      "must": [
        { "match": { "title":    "Search"        }},
        { "match": { "content": "Elasticsearch" }}
      ],
      "filter": [  (3)
        { "term":  { "status": "published" }},
        { "range": { "publish_date": { "gte": "2015-01-01" }}}
      ]
    }
  }
}
```

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Query using natural language

- Can we express the previous search in natural language?
- Of course, for instance:

  Search for all the **title** matching "Search" and **content** matching "Elasticsearch", filtering out the documents that do not have **status** equal to "published" and **publish_date** ≥ 2015-01-01

Elasticsearch DSL using ChatGPT
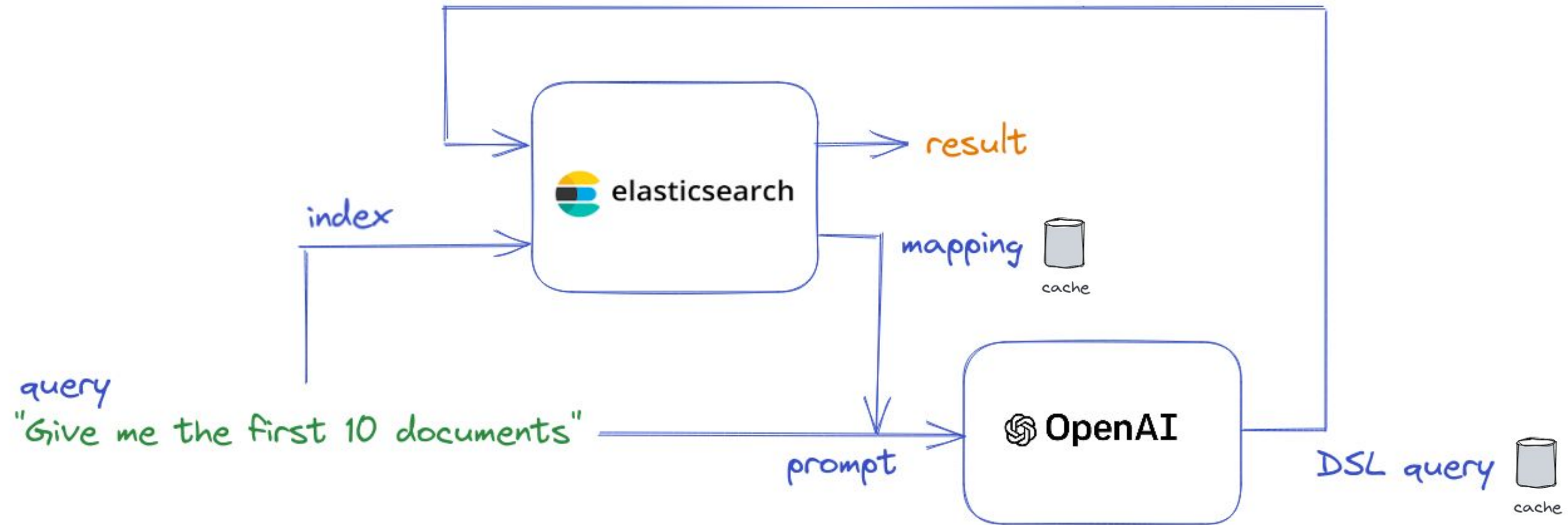
DEMO
https://chat.openai.com/

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Using ChatGPT in Elasticsearch PHP client

- Idea:
  - use the **/<index>/_mapping** API of Elasticsearch for retrieve the **mapping**, the "structure" of an index
  - use **ChatGPT** for translate a question in natural language in Elasticsearch DSL query using the previous **mapping**
- Proposal:
  - Implement a search function:
  - **search ("stocks", "Find the first 10 documents of the last month")**

ChatGPT prompt for Elasticsearch DSL

- We need to build a prompt request for ChatGPT for translating a query expressed in natural language (**query**) in Elasticsearch DSL
- A prompt can be as follows:
  - *Given the mapping delimited by triple backticks* ```**mapping**``` *translate the text delimited by triple quotes in a valid Elasticsearch DSL query* """**query**"""*. Give me only the json code part of the answer. Compress the json output removing spaces.*

Putting all together

result

index

mapping cache

query
"Give me the first 10 documents"

prompt

DSL query cache

prompt = Given the mapping translate the query
         in a valid Elasticsearch DSL query

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elasticsearch-chatgpt-php

DEMO

https://github.com/elastic/elasticsearch-chatgpt-php
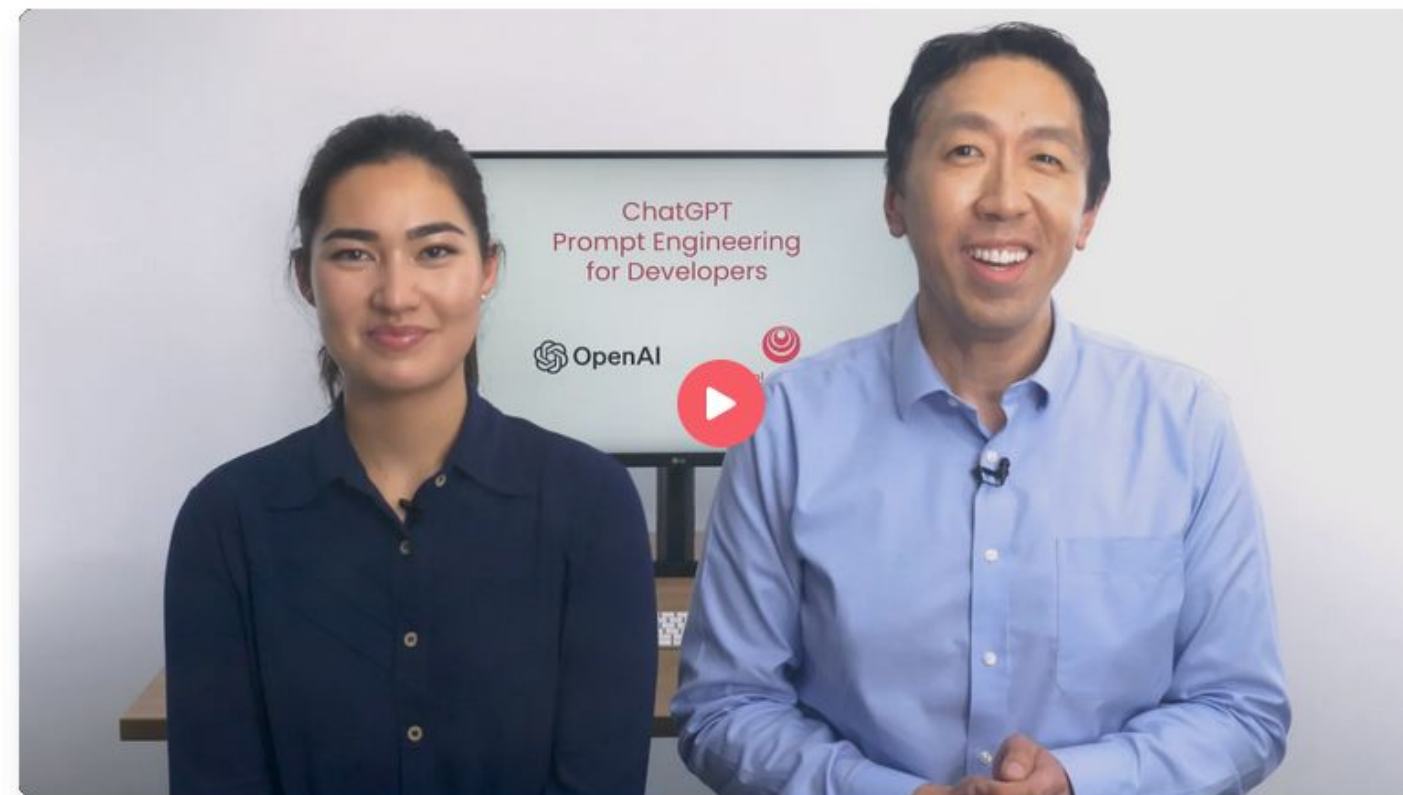
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Remember:
ChatGPT is limited!

> " ChatGPT is incredibly limited, but good enough at some things to create a misleading impression of greatness. it's a mistake to be relying on it for anything important right now. it's a preview of progress; we have lots of work to do on robustness and truthfulness.

Sam Altman, CEO OpenAI

ChatGPT for developers

- If you are interested in developing a ChatGPT application I suggest to have a look at this short course (free):
  - [ChatGPT Prompt Engineering for Developers](#), by DeepLearning.AI and OpenAI

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References

- Enrico Zimuel, [How to use Elasticsearch to prompt ChatGPT with natural language](), Elastic blog
- Jeff Vestal, [ChatGPT and Elasticsearch: OpenAI meets private data](), Elastic blog
- Baha Azarmi, [ChatGPT and Elasticsearch: A plugin to use ChatGPT with your Elastic data](), Elastic blog
- Benjamine Marie, [Run ChatGPT and GPT Models on Your Website with PHP]()
- [openai-php/client](), a PHP library to connect to OpenAI

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Thanks!

More information about [Elasticsearch and AI](#)

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