Natural Language Processing
Large Languade Models Usage Patterns

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November 13, 2023

Introduction

- Since the inception of Large Language Models, various patterns of use of this technology have emerged.
- In this talk, we will try to organize these patterns and give a general overview of them.

Source:

`https://www.masayume.it/img/masayume/Large-Language-Models.jpg`

Recap: What is an LLM

- An autoregressive language model trained with a Transformer neural network on a large corpus (hundreds of bullions of tokens) and a large parameter space (billions) to predict the next word.
- It is usually later aligned to work as a user assistant using techniques such as Reinforcement Learning From Human Feedback [Ouyang et al., 2022] or supervised fine-tuning.
- Some are private (access via API or web browser): Google Bard, ChatGPT, etc.
- Others are open (model's weights can be downloaded): Llama, LLama2, Falcon, etc.

LLMs Usage Patterns

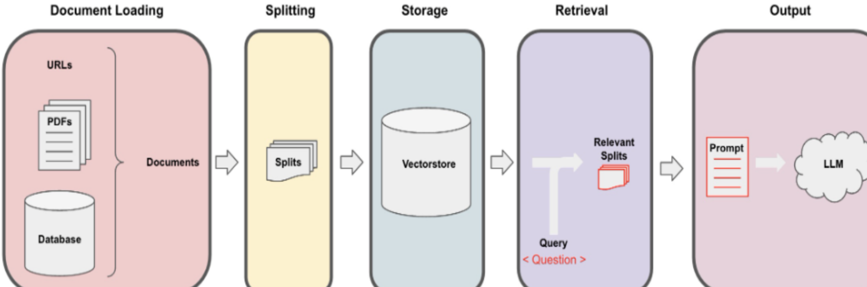
- Prompting
- Vector Databases
- Fine-Tuning
- Evaluation
- Agents

Prompting

- Prompt Engineering
- Chain of thought Prompting

Vector Databases

- Idea incorporate domain-scpefific knowledge not included during training.
- Rely on a Vector Database embed queries, retrieve relevant documents, append them into the prompt [Lewis et al., 2021].
- `https://www.infoworld.com/article/3709912/vector-databases-in-llms-and-search.html`
- `https://learn.deeplearning.ai/vector-databases-embeddings-applications/lesson/1/introduction`
- `https://stackoverflow.blog/2023/10/09/from-prototype-to-production-vector-databases-in-generative-ai-ap`



Instruction Fine-Tuning

- Paid Fine-Tuning (GPT-4??)
- Alpaca, Vicuna, Llama, Llama2
- https://blog.gopenai.com/paper-review-qlora-efficient-finetuning-of-quantized-llms-a3c857cd0cca

Datasets for Instruction Fine-Tuning

- Standford Alpaca Dataset (Vicuna)
- ShareGPT (Alpaca)
- Dolly-15K
- Orca Dataset

Parameter Efficient Fine Tuning

- Lora, QLora
- https://blog.gopenai.com/paper-review-qlora-efficient-finetuning-of-quantized-llms-a3c857cd0cca

Token-Incrementation

- Lora, QLora
- https://blog.gopenai.com/paper-review-qlora-efficient-finetuning-of-quantized-llms-a3c857cd0cca

LLMBench and LLm Arena

- MT-bench (categories)
- HuggingFace Open LLM Leaderboard
- LLM Arena

LangChain and Agents

- Bla

Questions?

Thanks for your Attention!

References I

Lewis, P., Perez, E., Piktus, A., Petroni, F., Karpukhin, V., Goyal, N., Küttler, H., Lewis, M., tau Yih, W., Rocktäschel, T., Riedel, S., and Kiela, D. (2021).
Retrieval-augmented generation for knowledge-intensive nlp tasks.

Ouyang, L., Wu, J., Jiang, X., Almeida, D., Wainwright, C., Mishkin, P., Zhang, C., Agarwal, S., Slama, K., Ray, A., et al. (2022).
Training language models to follow instructions with human feedback.
Advances in Neural Information Processing Systems, 35:27730–27744.