Large Language Models (LLM)

PA154 Language Modeling (12.2)

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From LM to Chat

- LM generates prompt continuation
- prompt engineering
- fine tune on chat texts
- some Q&A/chat texts are in training data

prompt engineering

- simple prompt:
  Q&A
  `Q: {question}`
  `A:`
- general knowledge:
  `Generate some knowledge about the concepts in the input.`
  `Input: {question}` `Knowledge:`
- task specific:
  `If {premise} is true, is it also true that {hypothesis}? ||| {entailed}.`

Chain-of-thought

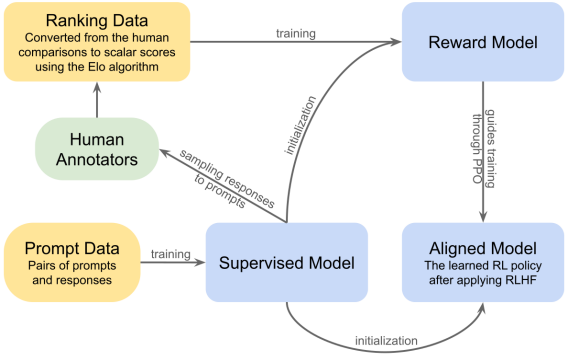
- direct asnwer is not correct for complex questions
- solve a problem in steps
- `Q: {question}`
  `A: Let's think step by step.`

Generated trained data

- there are never enough text with the right Q&As
- generate data from a pattern
  especially for chain-of-thought
- variation of variables (numbers in math, ...)
- generated using LLM

RLHF

Reinforcement Learning from Human Feedback



Alignment

- annotated data by humans
- training using RLHF
- eliminate toxicity, bias

Foundation models

- LLM without fine tuning
- can be used to addapt on a new domain/language
- fine-tuned on a specific task
  - chat
  - question answering
  - summarization

LoRA

- Low-Rank Adaptation of Large Language Models
- fine-tune only a small fraction of parameters
- usually only attention matrices