

knowledge base. The temporal misalignment problem on a fixed candidate database can be alleviated.

On the other hand, web search APIs are commercial products requiring subscriptions. Also, the vast amount of knowledge on the web can be difficult to control. The retrieved context from the Internet can be occasionally inconsistent, redundant, and toxic, which hinders the LLM reader.

Beyond retrieval augmentation, in a general scope, other tools called by LLMs, like code interpreters, online models, and expert applications, are all similar to search engines, without trainable parameters to optimize. There could be a gap between the LM and these tools. This paper proposes an idea to align them through a trainable small model.