

I. From several discussions in your class, identify a topic of your own.

Large language models and their growing complexity in the field of artificial intelligence

II. Identify the key variables in your title.

The independent variable is “*Large Language Models*” and it is the major area of research.

The dependent variable is “*Growing complexity*” as it explains how Large Language Models have gotten complex and how this affects their performance.

III. State the statement of the problem.

Artificial intelligence has seen remarkable advancements in recent years, particularly in the development of large language models (LLMs). These models have revolutionized natural language processing, enabling machines to understand and generate human language with unprecedented accuracy and fluency. However, the increasing complexity of LLMs has become a significant concern for researchers and practitioners alike. As the number of parameters and computational resources required to train and fine-tune these models grows exponentially, so do the challenges of deploying them effectively and efficiently. For example, OpenAI, a company that was founded by Sam Altman and Elon Musk in 2015, developed indeed the most controversial Language model, Chat Generative Pre-trained Transformer (ChatGPT) and reports from its researchers and the CEO (as recently stated in his zoom meeting at MIT) state that the expenses of running this model's previous version (GPT3) reached a minimum of \$700,000 a day. He went on and exclaimed that these expenses were eye-watering.

This model alone was trained on more than 3 trillion parameters, this means huge computational power and strong algorithms need to be deployed to make it work. This version is now free and a newer version as of this writing called GPT4 was released in early April with better responses and more features.

In this research proposal, we aim to explore the impact of increasing complexity on the performance of LLMs. Specifically, we will investigate the relationship between the growing complexity of LLMs and their accuracy, efficiency, and generalizability. By conducting a comprehensive literature review and designing a research methodology that combines empirical analysis and theoretical modeling, we hope to contribute to the ongoing discussion on the development and application of LLMs.

The findings of our research proposal will have important implications for the field of artificial intelligence, particularly for natural language processing and related applications. We believe that this research proposal will make a significant contribution to the field by shedding light on the potential benefits and challenges of LLMs and by providing insights into how their complexity can be managed to improve their performance.

IV. State the purpose of your topic

The purpose of the study is to understand more about large language models in the field of artificial intelligence and how they are affected by size and complexity.

V. Give three research objectives and three research questions.

Objectives

To analyze the effect of complexity on Large Language Models.

To find out ways of fine-tuning large language models without making them too complex

To understand the constraints under which large language models work best.

Questions

What is the effect of complexity on Large Language Models?

How can we fine-tune Large Language Models without making them so complex?

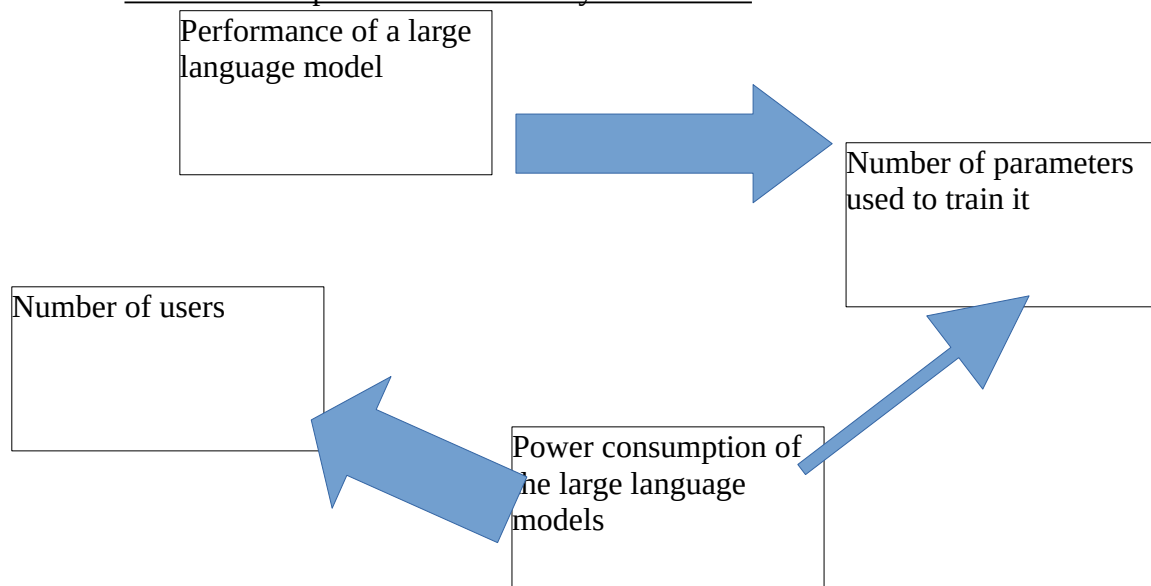
Under what constraints do large language models work best?

VI. Highlight the significance of your research.

This research is to help future researchers in the field of artificial intelligence to understand and fine-tune their models well.

This research is also to help understand the process of creating, training, and deployment of Large language models.

VII. Create a conceptual framework for your research



VIII. Explain the likely limitations of your study

My research is likely to be limited by the small number of artificial intelligence practitioners and researchers mainly in my geographical boundary. This lessens my source of knowledge.

High level of secrecy kept by companies that make Large Language Models due to competition reasons makes the information to feed my curiosity scarce also.

Due to the field of artificial intelligence being a very new field, many people haven't made research on it and it lessens the amount of resources online for research.