PROJECT TITLE

Adaptive Fine-Tuning of LLMs for Historical Event Narration Using LoRA

Project description: For this project, we are submitting one of the pre-approved projects. We will implement LoRA (Low-Rank Adaptation) to adapt a pre-trained Large Language Model (LLM) for generating engaging historical narratives. Specifically, we'll fine-tune an open-source LLM (such as Mistral-7B) on a custom dataset of historical events from Wikipedia or similar sources, enabling the model to narrate events as interactive stories with creative twists like "what-if" alternatives or underrepresented perspectives.

Team Members

- Keerthirajan Senthilkumar (G30591267)
- Prithvi Saran Sathyasaran (G44070057)
- Roshini Venkateswaran (G29749825)

Research References:

1. **Hu, Edward & Shen, Yelong & Wallis, Phillip & Allen-Zhu, Zeyuan & Li, Yuanzhi & Wang, Shean & Chen, Weizhu. (2021). LoRA: Low-Rank Adaptation of Large Language Models. 10.48550/arXiv.2106.09685.**

   This paper introduces LoRA as a method to fine-tune LLMs by injecting low-rank matrices, reducing trainable parameters by up to 10,000x while maintaining performance, enabling efficient adaptation for domain-specific tasks like historical narration without full model retraining, making it ideal for our project's focus on fine-tuning.

2. **Hugging Face PEFT Library Documentation (https://github.com/huggingface/peft)**

   This guide provides practical implementation details for applying LoRA in PyTorch, including code examples for LLM fine-tuning; it applies to our project by offering a streamlined framework to integrate LoRA with models like Mistral-7B, ensuring we can achieve high-quality results with limited compute.

3. **Wikimedia/Wikipedia Dataset on Hugging Face (https://huggingface.co/datasets/wikimedia/wikipedia)**

   This dataset offers structured Wikipedia dumps with historical articles and events; its value is in providing a free, rich source of narrative pairs for curating our custom fine-tuning data, allowing us to focus on underrepresented historical perspectives for educational impact.