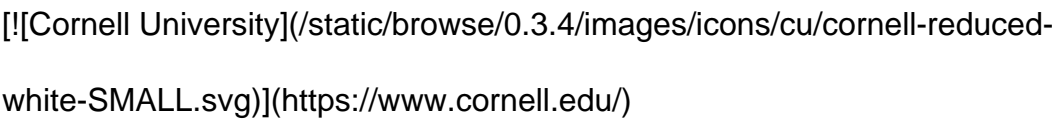


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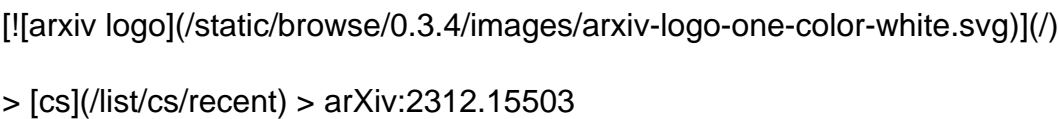
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Authors:[Chaofan

Li](<https://arxiv.org/search/cs?searchtype=author&query=Li,+C>), [Zheng Liu](<https://arxiv.org/search/cs?searchtype=author&query=Liu,+Z>), [Shitao Xiao](<https://arxiv.org/search/cs?searchtype=author&query=Xiao,+S>), [Yingxia Shao](<https://arxiv.org/search/cs?searchtype=author&query=Shao,+Y>)

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> Abstract:Dense retrieval needs to learn discriminative text embeddings to  
> represent the semantic relationship between query and document. It may  
> benefit from the using of large language models (LLMs), given LLMs' strong  
> capability on semantic understanding. However, the LLMs are pre-trained by  
> text generation tasks, whose working pattern is completely different from  
> representing texts as embeddings. As a result, it is imperative to study how  
> to adapt LLMs properly so that they can be effectively initialized as the  
> backbone encoder for dense retrieval.  
> In this paper, we propose a novel approach, called LLaRA (LLM adapted for  
> dense Retrieval), which works as a post-hoc adaptation of LLM for the dense  
> retrieval application. LLaRA consists of two pretext tasks: EBAE (Embedding-  
> Based Auto-Encoding) and EBAR (Embedding-Based Auto-Regression), where the  
> text embeddings from LLM are used to reconstruct the tokens for the input  
> sentence and predict the tokens for the next sentence, respectively. LLaRA  
> turns out to be simple, lightweight, and highly effective. It is applied to  
> adapt LLaMA-2-7B (base) on the Wikipedia corpus, where it substantially

> improves the model's fine-tuned performances on a variety of dense retrieval  
> benchmarks, like MSMARCO and BEIR. Our model and code will be made publicly  
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