Enhancing Educational through The Integration of Retrieval-Augmented Generation in AI-Based Teaching Assistant Question-and-Answer Systems

Abstract

As technology continues to evolve, Artificial Intelligence (AI) has found a prominent role in education, particularly through the integration of AI-based Teaching Assistant (TA) Question-and-Answer (QA) systems. This paper explores the application of the retrieval-augmented generation (RAG) technique, connecting large language models (LLMs) to a private knowledge base. By utilizing RAG on a personal computer (PC), instructors can seamlessly link to private sources, such as emails, notes, or articles, ensuring data confidentiality while enhancing the effectiveness of AI-based TA systems. This integration facilitates real-time information retrieval, providing accurate and personalized responses in natural language, thereby improving the overall learning experience for students.