Chatbot for Computer Science

Project Team: Kennedy Martin, Israel Agoe-Sowah, Eric Simoni, Antony Fuentes
Computer Science
Project Number CS 25-314

Faculty Advisor: Caroline Budwell, Ph.D.
Sponsor: Virginia Commonwealth University – Computer Science Dept.

This project focuses on the development and deployment of a chatbot for the Virginia Commonwealth University (VCU) Computer Science department's webpages. Leveraging Retrieval-Augmented Generation (RAG) alongside FastAPI and HTML, the chatbot aims to streamline departmental operations by handling frequently asked questions related to course concentrations, academic timelines, and student organizations. By providing quick and reliable access to information, the chatbot reduces the workload on administrative staff while improving the student experience.

RAG enables the chatbot to retrieve accurate and relevant information exclusively from university resources, ensuring that responses remain specific to departmental inquiries rather than serving as a tutoring tool. FastAPI enhances scalability and performance, allowing the chatbot to efficiently handle multiple concurrent users.

Testing will focus on evaluating multi-user interactions, ensuring the chatbot accurately responds to queries or, when necessary, directs users to appropriate resources. Maintenance will primarily involve updating relevant URLs and managing required service subscriptions.

Future enhancements include integrating FastAPI with WebSockets to support real-time interactions, implementing authentication for cookie-based query storage, and developing an administrator dashboard for managing user interactions. Additionally, maintaining consistent branding across webpages will align the chatbot with VCU's standards and vision.

Ultimately, this project will enable both incoming and current VCU students to easily access essential information about the Computer Science degree, facilitating a smoother transition into the university and supporting them throughout their academic journey. By automating responses to common inquiries, the chatbot will also reduce the workload on faculty and staff, allowing them to focus on more complex student needs.

Keywords: Chatbot, Retrieval-Augmented Generation, Student Support