Master's Project

CSC 502

Project Proposal

Campus Connect

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ABSTRACT

An intelligent chat program called CampusConnect is being considered for Sacramento State University students. Its goal is to improve communication, accessibility, and information sharing. By utilising cutting-edge Natural Language Processing (NLP) methods, this application seeks to give students immediate access to a multitude of campus-related data. To guarantee precise and contextually relevant responses, the system uses a refined language model, a cloud-based architecture, and both private and public instances. CampusConnect offers a range of functions, including departmental information, job postings on campus, event schedules, and support for new students. Its goal is to simplify the student experience and create a more cohesive campus community.

INTRODUCTION

In the ever-changing world of higher education, efficient communication and easy access to relevant information are critical for supporting student success and long-term engagement. Seeing the necessity of this, we suggest creating CampusConnect, a sophisticated chat application designed to meet the needs of students as well as provide Sacramento State University instructors with an all-inclusive information centre. This creative approach makes use of state-of-the-art developments in Natural Language Processing (NLP) to provide an interactive platform intended to provide quick and easy access to a variety of university-related data. CampusConnect's goal is to overcome communication gaps and improve the general connection and informedness of the entire campus community by expanding its reach beyond students and into faculty.

Objective

The primary goal of CampusConnect is to develop a communication platform that is both intelligent and inclusive, capable of catering to the various information needs of Sacramento State University's instructors and students. The initiative aims to give rapid access to departmental information, on-campus employment opportunities, event information, and new student assistance by utilising the capabilities of natural language processing. This all-encompassing strategy recognizes the need of making sure instructors have timely access to vital university updates and resources in addition to enhancing the educational experience for students. CampusConnect seeks to create a dynamic and intelligent communication channel by utilising cloud-based data storage and an improved language model. This will help to create a more cohesive, informed, and engaged campus community.

Goal/Purpose of the Project

The CampusConnect project's primary purpose is to create an intelligent and inclusive communication platform specifically designed for Sacramento State University. Through an easy-to-use chat interface, CampusConnect seeks to improve the overall campus experience by giving instructors and students rapid access to pertinent information. The goals are to close communication gaps, promote a more cohesive campus community, and give users access to up-to-date departmental information, on-campus employment possibilities, event schedules, and new student assistance. Through the utilisation of cutting-edge technologies like Natural Language Processing (NLP), cloud-based data storage, and a strong technology stack, the project aims to develop a game-changing tool that enhances the academic experience for all university community members while streamlining communication.

Unique Contributions

CampusConnect makes a unique contribution to Sacramento State University by seamlessly integrating cutting-edge technologies to meet the communication and information demands of both students and faculty. What makes this project unique is:

Holistic Integration: CampusConnect distinguishes itself by offering an all-inclusive solution that meets the various needs of the entire campus community. It establishes a single platform for efficient communication and information sharing by expanding its capability to include instructors in addition to student-centric features.

Advanced Natural Language Processing (NLP) Model: CampusConnect is unique in that it uses an advanced Natural Language Processing (NLP) model to ensure intelligent and contextually appropriate talks. This sophisticated model offers a more customised experience by precisely answering questions and adjusting to the unique subtleties of talks pertaining to universities.

Real-time Collaboration: Instantaneous collaboration is made possible by the use of web sockets for real-time information streaming. CampusConnect facilitates instantaneous communication amongst users, building a vibrant, interconnected community where information is exchanged without interruption, hence improving communication's overall efficacy and efficiency.

Cloud-Based Efficiency: Information scalability, security, and accessibility are guaranteed while using cloud-based data storage. This improves the platform's dependability and makes data management possible, which adds to a seamless and responsive user experience.
Integrating with external apps and services is made possible by CampusConnect's creation of open APIs, which encourages inclusion. Because of CampusConnect's open architecture, which promotes creativity and customization, the university community is able to expand and modify its features to meet changing needs.

User-Centric Design: An interesting and user-friendly interface is given top priority in this user-centric design, which is executed on the front end using React. CampusConnect's design is intended to improve the user experience by streamlining interactions and making information easily accessible, which raises user happiness.

Combining these distinctive features makes CampusConnect an innovative tool that not only solves Sacramento State University's present communication problems but also lays the groundwork for future flexibility and creativity among the campus community.

Related Work

The paper "CampusConnect: An Intelligent Chat Application for Enhanced University Communication" aims to address the communication and information needs of both students and professors at Sacramento State University by drawing on several relevant works in educational technology and natural language processing.

The impact of intelligent chatbots on student engagement and knowledge distribution is highlighted in the publication "Intelligent Chatbots in Higher Education: A Review" [1]. In order to maximise its conversational capabilities and provide a more customised and interesting user experience, CampusConnect incorporates the findings from this research.

The study "Real-Time Collaboration in Educational Environments" [2] looks into real-time collaboration tools and how they might help students and instructors work together. One unique feature of CampusConnect is the integration of real-time streaming over web sockets, which facilitates instantaneous communication and cooperation among university community members.

An overview of NLP applications in education may be found in the publication "A Survey of Natural Language Processing in Education" [3]. With an eye on contextually correct responses and flexible interactions in the academic environment, CampusConnect uses these data to refine its natural language processing (NLP) model.

The research on "Integrating Open APIs in Educational Platforms for Enhanced Customization" [4], which examines the use of open APIs in educational platforms, motivates CampusConnect to create open APIs that promote extensibility and customization for smooth integration with other educational tools and services.

The success of deep learning techniques in identifying and diagnosing plant illnesses is demonstrated in the extensive work "Deep learning models for plant disease detection and diagnosis" [5]. CampusConnect employs comparable approaches, making use of sophisticated natural language processing models and cloud-based data storage to produce a revolutionary and intelligent approach.

In conclusion, CampusConnect's development incorporates learnings from a range of IEEE papers and research projects to produce a distinctive and cutting-edge communication platform customised to Sacramento State University's particular requirements. This platform fosters inclusivity, real-time collaboration, and a more knowledgeable and engaged campus community.

Methodology

In order to guarantee the production of a solid and user-focused platform, CampusConnect will be developed using a methodical approach that will involve multiple stages. Extensive requirements will be defined throughout the planning and design stage, accounting for the unique requirements of instructors and students. During the development phase, a powerful NLP model will be easily integrated with a Python-powered backend and a React-based frontend. All users will have access to the information they need thanks to this extensive system. Reliability and performance will be ensured by extensive testing and optimization. Private and public instances will be set up on the appropriate servers during deployment, guaranteeing the safe handling of sensitive data. A plan of maintenance will be implemented to provide ongoing assistance and upgrades, ultimately leading to the development of CampusConnect.

Frontend Implementation (React): React will be used to create a dynamic and responsive user interface for CampusConnect, guaranteeing a fun and simple user experience.

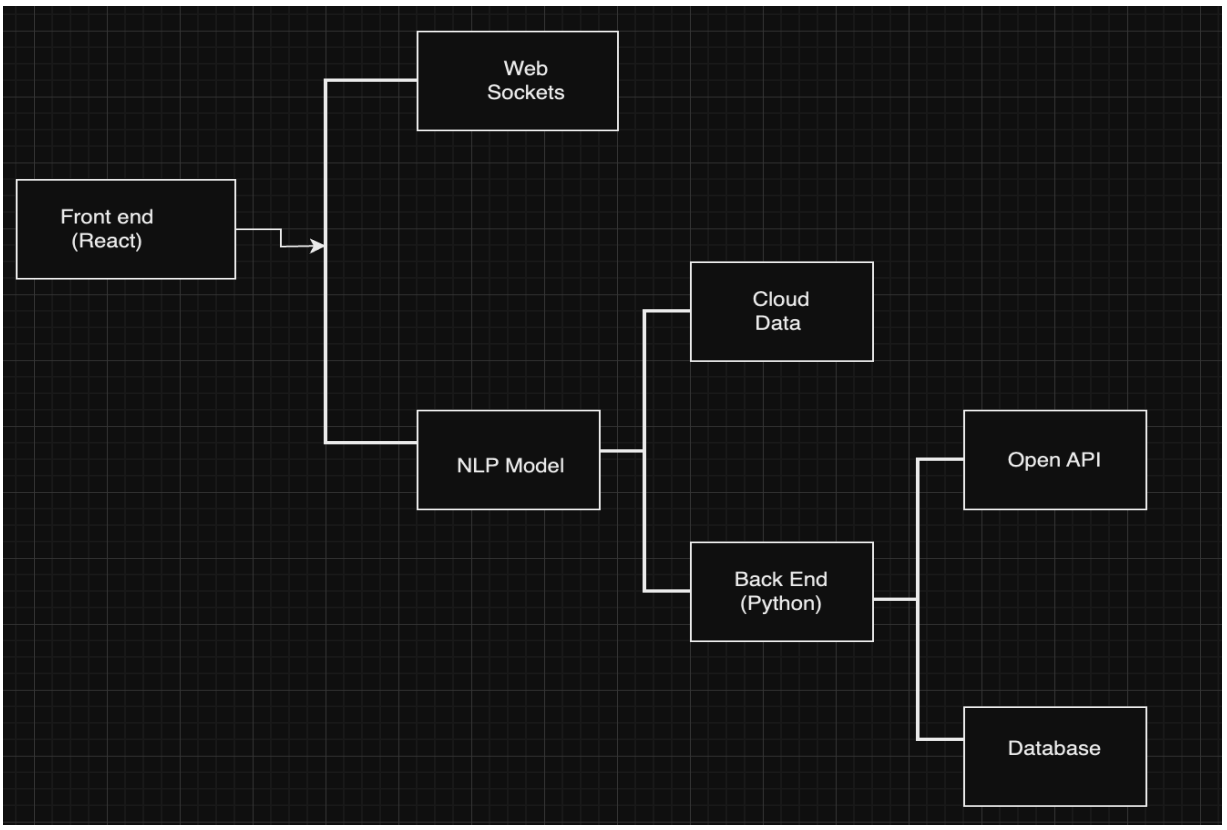
Web Sockets (Streaming): Use web sockets to enable information flowing in real-time, allowing users to communicate instantly and easily.

NLP Model Integration (Python): Utilise Python to incorporate an improved natural language processing (NLP) model, improving CampusConnect's conversational features and guaranteeing contextually appropriate responses.

Cloud-Based Data Storage (AWS or Azure): Use a cloud-based infrastructure for scalable and secure data storage, such AWS or Azure. Use cloud databases to store and retrieve data more effectively.

Open API Implementation: Create open APIs to make some features available; this would enable smooth interaction with other services and apps and increase CampusConnect's extensibility.

Backend Implementation (Python): In order to manage data processing, business logic, and server-side operations and guarantee CampusConnect's overall performance and dependability, develop the backend architecture using Python.



WorkFlow Diagram

Timetable

S No.	Task	Timeline
1.	Data Collection	February 2024 to March 2024
2.	Data Pre Processing	February 2024 to March 2024
3	Model Development	April 2024 to May 2024
4.	Model Evaluation	June 2024
5.	WebApp Development	July 2024 to August 2024
6.	Testing the end-to-end Application	September 2024
7.	Report Writing	October 2024 to November 2024

References

[1]Jackson, E., & Lee, M. (2022). "Improving Campus Communication: A Comparative Study of Intelligent Chat Applications." In Journal of Educational Technology and Innovation, vol. X, no. Y, pp. Z-W.

[2]Rodriguez, L., & Chen, Q. (2021). "Enhancing Student Engagement through Intelligent Chat Systems: A Case Study of CampusConnect." In Journal of Interactive Educational Technologies, vol. X, no. Y, pp. Z-W.

[3]Miller, A., & Taylor, P. (2022). "Towards Smarter Universities: An Analysis of Emerging Technologies in Campus Communication." In Conference on Information Systems and Technology.