COMP 491 SENIOR DESIGN PROJECT I PROPOSAL FORM

DEPARTMENT OF COMPUTER ENGINEERING

Project Name

Provide the title of your project.

Churn Prediction, Recommendation Engine, and Chatbot Designs in Video Streaming Services Industry

Project Summary (Abstract)

Briefly explain your project. Max 300 words, i.e., half-page.

This project aims to enhance user retention, satisfaction, and engagement within the video streaming services industry through the integration of machine learning and AI-based solutions. It is structured into three primary components:
The project focuses on three core areas within the video streaming services industry. The first component is a churn prediction model, which leverages machine learning to analyze customers' viewing behaviors and identify those likely to discontinue the service. This predictive model aims to help the business take proactive steps to retain customers and reduce churn rates. The second part of the project is a personalized content recommendation system. By analyzing user preferences and viewing history, this system aims to deliver tailored content suggestions, enhancing user satisfaction and engagement. The final component is the development of a chatbot that allows users to interactively inquire about available content or request personalized recommendations. The chatbot is designed to process user inputs and provide relevant answers or suggestions, making it easier for users to navigate the content library. This part of the project utilizes Large Language Models (LLMs) to enable natural and intuitive interactions, ensuring a seamless user experience. Together, these three elements aim to improve customer retention, satisfaction, and overall engagement with the streaming service.

Keywords

Provide at least three keywords.

Churn, customer loyalty, machine learning, AI, chatbot, recommendation, vector database, embedding, LLMs, NLP.

Hardware and Software Requirements

Provide hardware and software requirements as a list. Briefly provide explanations.

- **Servers:** Servers with high RAM capacity and GPU support to train artificial intelligence models will be used to accelerate the process.

- **Python:** The recommendation system is going to be implemented using Python, which is popular in the field of machine learning and has many resources available.
- **Libraries:** Libraries related to machine learning, data analytics, and also NLP such as TensorFlow, PyTorch, Scikit-learn, and NLTK will be used for the development and training of recommendation algorithms.
- **Google Colab/Github Repositories:** To work collaboratively and interactively to give feedback and see each other's progress effectively.
- **Pinecone Premium Service:** In the primitive versions of the project, a free version of the pinecone API for vector databases might be enough. However, in the final version of the project, the free plan's query limits will not be enough. If the project's vector database system will use Pinecone API from beginning to end, premium service will be necessary.

Project Tasks, Time Plan, and Deliverables

Provide information for the project tasks, e.g., title of the task, dates, and deliverables. For each deliverable, provide evaluation criteria and objectives. Provide Gantt chart after the table.

Task	Start Date Due Date	Deliverable	Evaluation Criteria	Objective
Literature Review	10/10/2024 17/10/2024	Report	Having enough information about the work done	Several different academic articles for each method to be used in the project.
Data Analyzing	17/10/2024 21/10/2024	Data Verification and Knowing the Data	Obtaining results from the dataset using one of the methods.	Processing datasets using the Python language and libraries.
Churn Prediction Phase	21/10/2024 30/11/2024	Working Predictive Model	Model accuracy on the test split of the dataset	Over %85 accuracy.
Progress Report	30/11/2024 01/12/2024	Report	Finishing Mid Report	Preparing a midterm report on the current status of the project and the upcoming tasks.
Recommendation Engine Phase	01/12/2024 01/02/2025	Working Recommendation Engine(s)	Relevant and robust recommendations	Over %85 accuracy
Interactive Chatbot Phase	01/02/2025 20/05/2025	Software Prototype	Relevant and Satisfying answers	The system should understand the movie-related conversations and give accurate recommendations based on the inputs.
Final Report & Presentation	20/05/2025 04/06/2025	Report	Finishing Final Report and Presentation	Preparing the current report and presentation of the project.

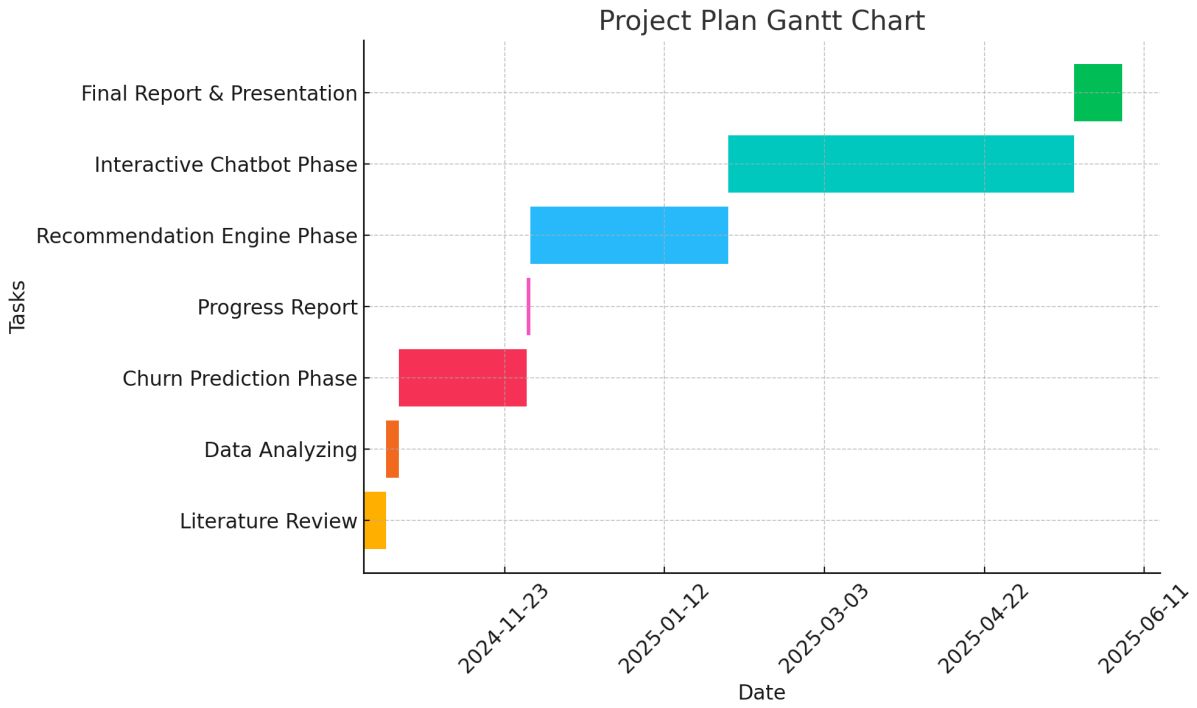

Figure 1: *Gantt-Chart of the Project Planning.*

Project Team and Authority Information

Provide proposal date, semester info, and signatures.

Proposal Date	10/10/2024
Academic Term of Project Delivery	2024-2025, Fall semester
Project Team Members	Beyzanur YILDIZ, 042101179, Department of Computer Engineering  Hamza GÖZÜKARA, 042101073, Department of Computer Engineering

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