**Internship Report**

**Internship Title:** GenAI Chatbot Development and Enhancement  
**Intern:** Danda Lakshmi Manisankar  
**Internship Duration:** February 10,2025 – March 10,2025  
**Company:** Null Class Internship

**Introduction**

This report summarizes the key tasks completed during my internship, focusing on the development and enhancement of an AI-powered chatbot. The project involved implementing analytics tracking, integrating multi-modal capabilities, and expanding language support for the chatbot.

**Objectives(Tasks)**

1. **Implement chatbot analytics** to track user interactions, queries, and satisfaction ratings.
2. **Develop a multi-modal chatbot** capable of processing both text and image inputs.
3. **Enhance multilingual support**, allowing the chatbot to detect, translate, and respond in multiple languages.

**Task 1: Chatbot Analytics Implementation**

**Objective:** To track chatbot interactions, identify common queries, and analyze user satisfaction.

**Implementation Details:**

* Used **Pandas** for data processing and analysis.
* Designed a **Streamlit dashboard** displaying key chatbot usage metrics.
* Trained a **machine learning model** to classify user satisfaction ratings.
* Implemented **TF-IDF vectorization** for text processing.
* Created a **bar chart** to visualize the most common chatbot topics.

**Key Code Components:**

* Data processing using Pandas.
* ML model using **TensorFlow/Keras**.
* Dashboard with **Streamlit’s metric and bar chart components**.

**Outcome:**

* Successfully created an interactive **dashboard** showing chatbot performance insights.
* The chatbot achieved an around accuracy of **73%** in rating user satisfaction.

**Task 2: Multi-Modal Chatbot Development**

**Objective:** To integrate text and image processing capabilities using **Google Gemini AI** and **Stable Diffusion**.

**Implementation Details:**

* Used **Google Gemini AI** for text generation.
* Integrated **Stable Diffusion (via Diffusers library)** for generating images from text prompts.
* Optimized **CUDA** support for efficient image generation.
* Designed a user-friendly **Streamlit interface** for smooth interaction.

**Key Code Components:**

* API integration with **Google Gemini AI** for text responses.
* Image generation using **Stable Diffusion models**.
* Optimized memory management using **Torch CUDA acceleration**.

**Outcome:**

* The chatbot can now **respond with text** and **generate images** based on user inputs.
* Users can request images using the command **"generate image: [description]"**.

**Task 3: Multilingual Chatbot Enhancement**

**Objective:** To support multiple languages and ensure accurate, culturally appropriate translations.

**Implementation Details:**

* Integrated **GoogleTranslator** or DeepTranslator for automatic translation.
* Used **LangDetect** to detect the user’s input language.
* Implemented **seamless switching** between languages.
* Configured **Google Gemini AI** to process and respond in multiple languages.

**Key Code Components:**

* **LangDetect** for automatic language detection.
* **GoogleTranslator** for real-time translation of queries and responses.
* **Google Gemini AI** for enhanced multilingual text generation.

**Outcome:**

* The chatbot can now automatically **detect, translate, and respond** in different languages.
* Supports at least **three additional languages** beyond English.
* Ensures culturally appropriate responses by adapting to different languages.

**Challenges Faced & Solutions**

1. **API Limitations:** Faced rate limits with Google Gemini API. Solved by optimizing API calls and implementing caching.
2. **Model Training Time:** Image generation was slow initially. Improved by **enabling CUDA acceleration** and reducing inference steps.
3. **Language Translation Accuracy:** Some translations were inaccurate. Improved by **choosing appropriate translation models** and validating outputs.

**Conclusion & Future Work**

**Achievements:**

* Successfully implemented **real-time chatbot analytics**.
* Developed a **multi-modal chatbot** supporting text and image generation.
* Extended the chatbot to **support multiple languages** with automatic detection and translation.

**Future Enhancements:**

* Implement **voice input/output** for a better user experience.
* Expand **multilingual support** to cover more languages.
* Enhance **real-time analytics** using a cloud database.
* This internship provided hands-on experience in **AI, NLP, and chatbot development**, strengthening my understanding of **machine learning, API integration.**