# CHATBOT FOR INTERNATIONAL STUDENTS

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***Abstract*— The increasing influx of international students in universities across the United States presents unique challenges, particularly in navigating complex administrative processes and adjusting to new cultural environments. To address these needs, we developed an AI-powered ChatBot that provides round-the-clock assistance to international students. Utilizing Google's Gemini API and a user-friendly Gradio interface, the ChatBot offers instant access to essential information and support, significantly easing the transition into university life for these students. Our methodology involves a structured approach to deliver personalized guidance tailored to individual needs, enhancing the educational experience by adapting to diverse learning behaviors and preferences. The results indicate that the ChatBot effectively handles various queries, from visa renewals to healthcare services registration, demonstrating precision and reliability in its responses. This paper details the development, functionality, and impact of the ChatBot, illustrating its effectiveness in supporting international students by ensuring they receive timely and accurate information, thereby facilitating a smoother adjustment and successful academic tenure.**

## I. Introduction

In recent years, the dynamics of university communities have evolved significantly, marked by a notable increase in international student enrollments. The United States continues to be a premier destination for these students, underscoring its role in shaping global education trends.

The influx of international students not only diversifies the student body but also enriches the overall educational experience. These students bring diverse perspectives that contribute to a vibrant, multicultural environment, promoting global awareness and cultural exchange. Such diversity is invaluable, and creating an inclusive atmosphere that supports the success of these students is essential. By fostering a welcoming campus environment, we facilitate their integration and active participation in the academic community.

However, international students encounter unique challenges, including navigating complex immigration laws, which can add stress and detract from their academic focus. Administrative hurdles such as visa renewals and compliance with local and federal laws further complicate their experiences, impacting their academic pursuits.

To address these challenges, we have developed a ChatBot that leverages AI technology, in accordance with university policies, to provide personalized guidance tailored to the unique needs of each student. This AI-driven tool analyzes vast amounts of data to offer customized advice and support, enhancing students' educational experiences by adapting to individual learning behaviors and preferences.

The ChatBot aims to empower international students by offering instant access to essential information and support, easing their transition into university life. It is accessible 24/7, serving as a virtual advisor for immigration-related inquiries and more, ensuring that resources are accessible regardless of time zones or geographical barriers.

Utilizing Google's Gemini API for fine-tuning, based on resources from the university's website, our ChatBot delivers accurate and contextually relevant answers. It operates around the clock. This capability ensures that all students, irrespective of their schedules or time zones, receive timely assistance, thereby making education more inclusive.

By continuously updating and refining its knowledge base, the ChatBot remains a relevant and valuable resource throughout the student's educational journey. It is specifically designed to respond to a wide range of queries, including visa applications, I-20 form, I-94 form, and other administrative documents, ensuring that each student's unique background and questions are addressed effectively.

## II. Methodology

Our methodology for developing the ChatBot utilizes advanced technologies and a structured approach to deliver a robust and user-friendly solution for international students. Here's an outline of our process:

### A. Text Generation with Google's Gemini API

In Figure 1, we begin by importing necessary modules and securely configuring the Gemini API with a key. The core function, gemini_text_service_call(), is designed to take a user's text prompt as input. Within this function, we initialize a GenerativeModel named 'gemini-pro' and invoke its generate_content method using the provided prompt. This interaction processes the prompt and produces the required text output by leveraging AI capabilities.

```python
import google.generativeai as genai
import os

def gemini_text_service_call(input_prompt):
    genai.configure(api_key="#") # replace with : os.environ["API_KEY"]
    model = genai.GenerativeModel('gemini-pro')

    response = model.generate_content(input_prompt)
    return response.text


input_prompt = "Write a story about a magic backpack."
output_text = gemini_text_service_call(input_prompt)
print(output_text)
```

Fig. 1. Code Block of Chatbot with Gemini API

### B. ChatBot Interface with Gradio

Figure 2 demonstrates, the gemini_chat_service_call function is crucial for creating a simple web interface using

Gradio. Initially, we configure the AI model with an API key and initialize the 'gemini-pro' model with a training prompt that sets the context of the chatbot's function — primarily assisting an international student by interpreting specific information from a referenced website. Subsequent function calls involve sending the user's prompt to the ongoing chat session and returning the model's response, thus maintaining a continuous conversation flow and enhancing user experience by keeping the context intact between questions. The Gradio interface is then launched with a public sharing option, making the chatbot accessible via a web link.

```python
import os
import gradio
import google.generativeai as genai

has_started_chat = False
chat = None

def gemini_chat_service_call(input_prompt):
    global has_started_chat, chat
    genai.configure(api_key="#")  # replace with : os.environ["API_KEY"]
    model = genai.GenerativeModel('gemini-pro')
    training_prompt = (
    "Hello, I'm an international student going to University of Tennessee at Knoxville "
    "having trouble understanding the information on this website: "
    "https://utkisss.atlassian.net/wiki/spaces/IPFP/pages/20774918/Guides+for+Students. "
    "I'll ask specific questions about the content in separate prompts. "
    "Can you help me interpret the information and answer my questions?"
    )
    if not has_started_chat:
        chat = model.start_chat()
        has_started_chat = True  # Set flag after starting chat

    if len(chat.history) < 2:
        train_response = chat.send_message(training_prompt)
        print(train_response.text)
        response = chat.send_message(input_prompt)
        return response.text

    else:
        response = chat.send_message(input_prompt)
        return response.text

demo = gradio.Interface(
    fn=gemini_chat_service_call,
    inputs="text",
    outputs="text",
    title="Chatbot for International Students",
    description=(
        "This is a helpful assistant for international students. "
        "You can ask any visa application related questions."
    )
)
demo.launch(share=True)
```

Fig. 2. Code Block for Chatbot Web API Using Gradio

### C. Continuous Improvement and Integration

The ChatBot tackles significant challenges faced by international students, such as navigating complex administrative processes and adjusting to a new cultural environment. To ensure the responses are accurate and contextually relevant, the ChatBot is fine-tuned using specific data from our university's resources. This data can be updated as regulations change. Future steps include integrating the ChatBot with the University of Tennessee's International Student and Scholar Services (UTK ISSS). This integration aims to transform how students interact with academic services, enhancing each interaction towards a more personalized educational journey. Additionally, with user consent, previous conversation data may be used to further improve and train the model. This allows for academic resource access, notifications, and direct interactions within preferred communication platforms, fostering a seamless and convenient experience for student engagement and support.

## III. Results

The ChatBot for International Students demonstrates a robust performance across various inquiries typical to the needs of this group. This section presents a detailed analysis of the results based on user interactions showcased in the screenshots provided.

### A. Visa Renewal Inquiry

The ChatBot effectively addresses specific inquiries regarding the renewal of a student visa. It provides a comprehensive list of requirements that are tailored to different types of student visas, such as F-1 and M-1 classifications. For instance, it details the necessity of a valid passport, proof of financial support, and specific forms such as the I-20. It also underscores the need for evidence of academic progress, a critical factor in the renewal process. This demonstrates the ChatBot's ability to provide personalized and precise information that aligns with federal regulations.

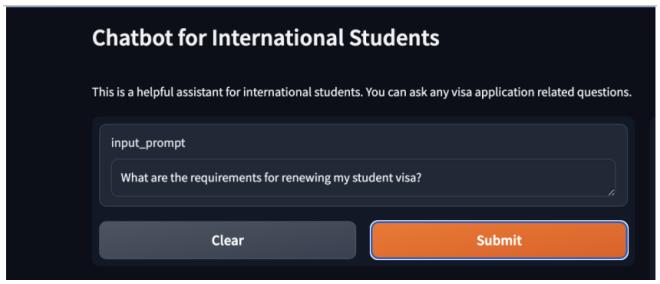


Fig. 3. Prompt Used for Inquiry on Visa Requirements

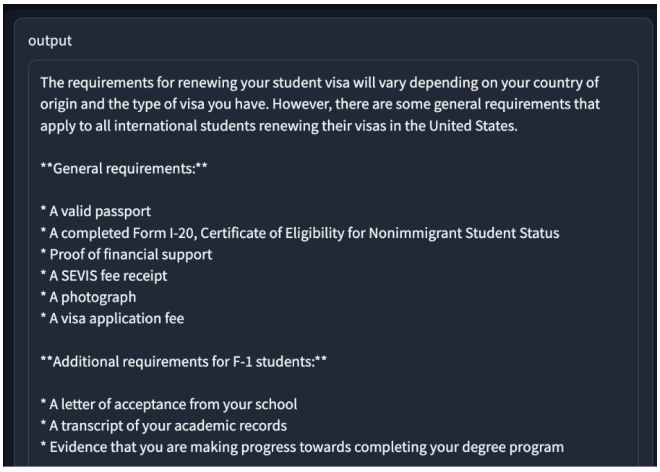


Fig. 4. Generated Text for Visa Requirements Prompt

### B. Healthcare Services Registration

In response to a query about registering for healthcare services on campus, the ChatBot outlines a clear, step-by-step process that students need to follow. It includes instructions for enrolling in the Student Health Insurance Plan (SHIP), activating an insurance card, and accessing services at the Student Health Center. Additionally, it provides detailed information about the services offered, such

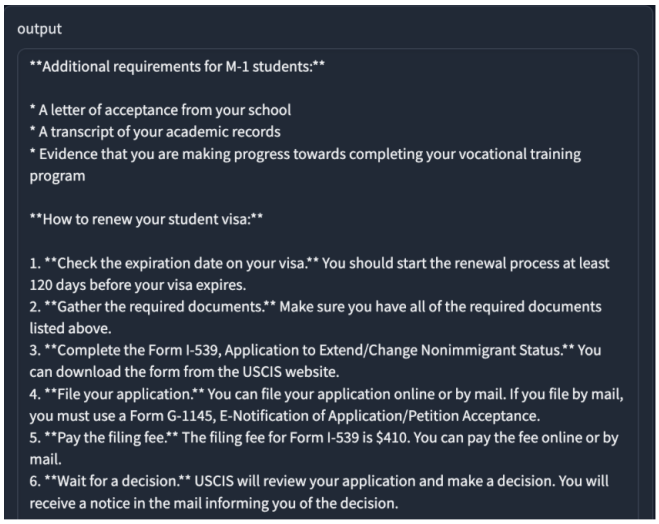


Fig. 5. Generated Text for Visa Requirements Prompt Continued

as primary care and mental health services, and practical information like operation hours and contact details. This response illustrates the ChatBot's utility in guiding students through necessary administrative processes, enhancing their campus experience and wellbeing. These results exem-

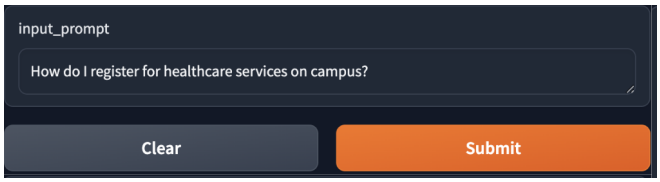


Fig. 6. Prompt Used for Inquiry on Health Services Registration

plify the ChatBot's effectiveness in providing critical and timely information tailored to the unique challenges faced by international students. It not only aids in navigating complex administrative procedures but also supports students in adjusting to their new academic and cultural environment. The accuracy and relevance of the information provided by the ChatBot ensure that international students receive reliable guidance, which is crucial for their success and satisfaction with the university experience.

## IV. Conclusion

In conclusion our ChatBot tackles significant challenges faced by international students, including navigating complex administrative processes and adjusting to a new cultural environment. To address these issues effectively, our ChatBot offers validated answers round-the-clock, ensuring that help is available whenever it's needed. This availability is crucial for providing continuous support to our diverse student body. Technically, the ChatBot is powered using Gemini API, which allows us to fine-tune the model using specific data from our university's resources. This can be easily updated as the regulation changes. This fine-tuning process ensures that the ChatBot's responses are not only accurate but also highly

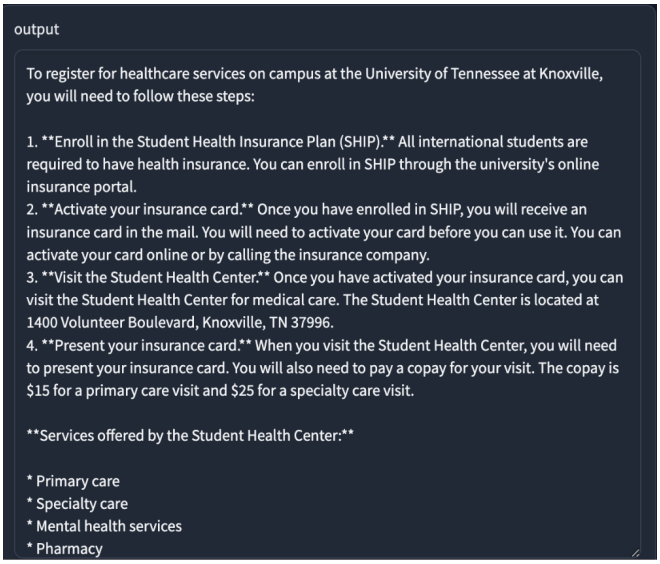


Fig. 7. Generated Text for Health Services Registration Prompt

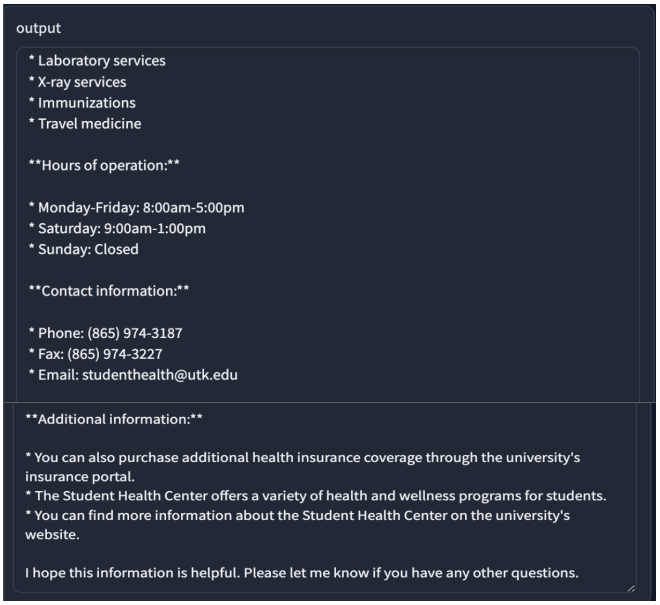


Fig. 8. Generated Text for Health Services Registration Prompt Continued

relevant to our students' needs. The next future steps would be integrate the ChatBot with the UTK ISSS (International Student and Scholar and Services) . This deeper integration transforms how students interact with our academic services, making every interaction with the ChatBot a step towards a more personalized educational journey. Also, with users consent we can use previous conversation data to further improve and train the model. This allows students to access academic resources, receive notifications, and interact with the ChatBot directly within their preferred communication platforms, fostering a seamless and convenient experience for student engagement and support.

## REFERENCES


[1] Heo, J., & Lee, J. (2019). CiSA: An inclusive chatbot service for international students and academics. In HCI International 2019–Late Breaking Papers: 21st HCI International Conference, HCII 2019, Orlando, FL, USA, July 26–31, 2019, Proceedings 21 (pp. 153-167). Springer International Publishing.

[2] https://ai.google.dev/gemini-api/docs/get-started/python

[3] https://ai.google.dev/api/python/google/generativeai/ChatSession