

**DEPARTMENT OF COMPUTER SCIENCE**

**FORMAN CHRISTIAN COLLEGE**

**(A Chartered University)**

**LAHORE, PAKISTAN**

**COMP-360 (A)**

**Intro to Artificial Intelligence**

**Project Proposal**

**AI-Powered University Admissions Chatbot**

**Group Members:**

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**Submitted to: Miss Aasia Khanum**

**Team Information**

**Team Members:**

1. **Abdullah Mehtab** - [241607845@formanite.fccollege.edu.pk](mailto:241607845@formanite.fccollege.edu.pk) (+92 335 0443496)
   * **Role:** Dataset preparation, data preprocessing, and model training.
   * **Responsibilities:** Collect and preprocess data, train the machine learning model, and evaluate its performance.
2. **Ali Mujtaba** - [261910678@formanite.fccollege.edu.pk](mailto:261910678@formanite.fccollege.edu.pk)
   * **Role:** Information Gathering and interface development.
   * **Responsibilities:** Gether information from potential users regarding what can be asked, or should be implemented, and design and implement a user-friendly graphical interface using Tkinter, integrate the chatbot backend.
3. **Laiba** - [261905484@formanite.fccollege.edu.pk](mailto:261905484@formanite.fccollege.edu.pk)
   * **Role:** Testing and evaluation.
   * **Responsibilities:** Develop test cases, conduct usability testing, and refine responses based on feedback.

**Introduction**

University admissions are often overwhelming for prospective students due to the volume of questions regarding programs, scholarships, and deadlines. Traditional methods like email and in-person consultations are time-consuming and inefficient, leading to delays and miscommunication.

The proposed project addresses these challenges by creating an **AI-powered chatbot** designed specifically to assist with university admissions. By utilizing **natural language processing (NLP)** and **machine learning (ML)**, the chatbot will provide timely and accurate information, significantly enhancing user experience and reducing administrative workload.

**Relevance in AI Context:**

This project demonstrates the potential of AI in transforming user interaction and streamlining processes. It explores key AI applications such as intent recognition, context-aware responses, and conversational flow, which are integral to the field.

**Objectives**

The project aims to achieve the following **SMART goals**:

1. **Specific:**   
   Develop a chatbot capable of answering admission-related queries with an accuracy rate of at least 85%.
2. **Measurable:**   
   Enable the chatbot to handle at least 200 distinct intents related to university admissions.
3. **Achievable:**   
   Design a prototype within six weeks using Python and open-source libraries.
4. **Relevant:**   
   Reduce the workload on admission staff by providing instant and accurate responses to FAQs.
5. **Time-Bound:**   
   Complete dataset preparation, model training, and deployment by **December 10, 2024**.

**Methodology**

1. **Data Collection and Preprocessing:**
   * Gather FAQs and documents related to university admissions from official websites, student queries, and administrative input.
   * Tokenize, lemmatize, and encode text using **NLTK** and **Scikit-learn**.
2. **Model Development:**
   * Train a **neural network model** (dense layers with dropout regularization) for intent classification.
   * Use **categorical cross-entropy loss** and optimize with **stochastic gradient descent**.
3. **Chatbot Integration:**
   * Build the user interface using **Tkinter**, ensuring accessibility and ease of use.
   * Integrate the trained model to generate real-time responses.
4. **Testing and Feedback:**
   * Conduct extensive testing to evaluate intent recognition accuracy and response relevance.
   * Incorporate user feedback to refine the system.

**Dataset**

* **Source:** University websites, administrative documents, and publicly available datasets.
* **Size:** Approximately 100+ labeled queries covering admissions, programs, deadlines, and scholarships.
* **Preprocessing:** Removal of duplicates, noise reduction, tokenization, and encoding.

**Tools and Technologies**

* **Python Libraries:**
  + **NLTK:** For text preprocessing.
  + **TensorFlow:** To build and train the neural network model.
  + **Tkinter:** To develop an interactive GUI.
* **Why These Tools?**
  + **NLTK and TensorFlow:** Ensure efficient text processing and model performance.
  + **Tkinter:** Simplifies GUI development, making the chatbot accessible on desktop platforms.

**Timeline and Milestones**

| **Milestone** | **Duration** | **Tasks** |
| --- | --- | --- |
| Dataset Collection and Preparation | Week 1-2 | Collect FAQs, preprocess data. |
| Model Development and Training | Week 3-4 | Design, train, and optimize the neural network. |
| Chatbot GUI Development | Week 5 | Create and integrate GUI with the chatbot. |
| Testing and Refinement | Week 6 | Conduct testing, refine responses, and finalize. |

**Evaluation Metrics**

1. **Accuracy:** Measure intent classification accuracy using precision and recall.
2. **Response Time:** Ensure the chatbot provides responses in under 2 seconds.
3. **User Satisfaction:** Collect feedback from at least 50 test users to achieve a good satisfaction rate.

**Ethical Considerations**

1. **Bias Mitigation:** Ensure dataset diversity to avoid biased responses.
2. **Privacy Protection:** Avoid storing sensitive user data to maintain confidentiality.
3. **Transparency:** Inform users that they are interacting with an AI system.

**Conclusion**

The proposed chatbot leverages AI to revolutionize the university admissions process, ensuring accessibility, accuracy, and efficiency. It reduces administrative burden while providing prospective students with a seamless and interactive experience. By addressing challenges like bias and privacy, the project sets a foundation for ethical AI deployment in educational institutions.

**Resources/References:**

1. ResearchGate: *Development of an AI Chatbot to Support Admissions and Career Guidance*. <http://dx.doi.org/10.22662/IJEMR.2020.4.2.013>
2. *How universities are using chatbots to improve the student admissions process | Full Fabric*. (n.d.). <https://www.fullfabric.com/articles/how-universities-are-using-chatbots-to-improve-the-student-admissions-process>
3. Rahman, A. (2024, March 22). A guide to building a custom GPT chatbot for university admissions. *Medium*. <https://medium.com/@ahmadrahman/a-guide-to-building-a-custom-gpt-chatbot-for-university-admissions-227b605e9e8c>