North South University

Department of Electrical & Computer Engineering

Project Report

Course Code: CSE327

Section: 05

Group: 07

Submitted To: Dr. Razib Hayat Khan

Submission Date: 11-08-2023

Project Title: A Complete System to Detect and Stop Cyber Bullying Along with AI Supported Mental Health Counseling ChatBot

Student Name	ID
Farhan Ishrak Tahmid	2031458642
Md. Nafiur Rahman	2014154042
Farhana Akbar	2012482042

Project Report

Project Title:
A Complete System to Detect, Stop Cyberbullying Along with AI-Supported Mental Health Counselling Chatbot.

Project Statement:
The goal of this project is to create a comprehensive system that integrates cutting-edge technology to identify and stop cyberbullying while also include a system for mental health therapy based on artificial intelligence. With this project, we hope to make the online world a safer place for everyone, especially those who are most at risk from the negative impacts of cyberbullying.

Our project's primary goal is to create a system that can identify cyberbullying. We seek to develop an algorithm that can recognize and detect instances of cyberbullying across various platforms and communication channels by utilizing deep learning and machine learning models. In order to identify hate speech, this system will employ an advanced text analysis technique

We will include a mental health counseling system powered by AI in our project in addition to the detecting system. We think it's critical to provide accessible and individualized mental health care since we are aware of the emotional toll that cyberbullying can have on people.

The frontend application will be developed using the Flutter framework, ensuring a seamless and user-friendly experience across multiple platforms, including Android and Windows.

Our implementation efforts will be concentrated within institutions in order to maximize the impact of our approach. By using a targeted strategy, we can create better control and monitoring systems that guarantee the anti-cyberbullying laws are being followed. With close cooperation from these organizations, we will adapt the system to meet their unique requirements and easily incorporate it into their current work processes.

Implementation:
We have developed our system in two parts.

In the first part, we created a Backend Server using Django, which efficiently processes incoming requests. Python served as the primary language for our Backend server. We utilized a Sqlite3 database for data handling and storage, following the Django Object-Relational Model (ORM) to interact with the database. All data operations such as inputting, updating, deleting, and creation were implemented using the Object-Oriented Programming approach. Additionally, we integrated our Deep Learning and Machine Learning models into the backend server. Our backend system also performs Image to Text conversion. We established API endpoints to facilitate constant communication between our Frontend Application and Backend Server, collecting and processing data from the frontend.

For the second part, we developed our Frontend Application using the Flutter Framework, enabling us to create a versatile application for Web, Android, iOS, Windows, and Linux platforms. We established a connection between our Frontend Application and Backend Server through APIs. In the Flutter application, we collected user data and sent it to the Backend Server for processing.

To achieve high accuracy in detecting Bangla and English Hate Speech, we implemented various Machine Learning and Deep Learning models. For Bangla Hate Speech detection, we employed models such as Linear SVM, Naïve Bayes, Random Forest Classifier, Logistic Regression, and Sequential Models. Among them, the Sequential Model achieved the highest accuracy of 83.27%.

Sequential Models are widely recognized for their effectiveness in Natural Language Processing tasks. For English Hate Speech Detection, we used models like Naïve Bayes, Linear SVM, and Decision Tree Models. Our highest accuracy of 96.37% was obtained using the Decision Tree Model.

To train our Machine & Deep Learning Models for Bangla Hate Speech Detection, we used “Benglai Hate Speech Dataset” from Kaggle. We collected some data via Google Form also and used them with it. For English HateSpeech detection we used a dataset named “Cyber Bullying Dataset”, which is mainly a Twitter Parsed Dataset. We also added some of our Google Form data with it.

Conclusion:

In conclusion, our project has successfully developed a comprehensive system aimed at detecting and preventing cyberbullying while incorporating an AI-based mental health counseling system. We recognized the critical importance of addressing cyberbullying, a pervasive issue with significant consequences for individuals' well-being and mental health.

By leveraging advanced AI technologies, we implemented a robust cyberbullying detection system capable of identifying and flagging instances of harmful behavior. Our system covers various aspects of cyberbullying, including detection, reporting, and taking appropriate actions against bullies. Furthermore, we integrated an AI-based mental health counseling system, providing a safe and accessible platform for individuals to seek support and guidance in a confidential manner.

Throughout the project, we meticulously planned and implemented our backend server using Django, incorporating deep learning and machine learning models to enhance accuracy and efficiency. We developed a user-friendly frontend application using the versatile Flutter framework, ensuring seamless user experiences across multiple platforms.

To address the challenges of implementation, we strategically focused on deploying our system within organizations, offices, and institutions. This approach allowed for better control, monitoring, and collaboration with established authority figures, leading to more effective cyberbullying prevention measures.

While our project achieved significant milestones, we acknowledge that there is room for future enhancements. Specifically, incorporating transformer models for improved accuracy in Bangla cyberbullying detection and further refining the ChatBot by leveraging our own generative text methods.

In conclusion, our complete system to detect and prevent cyberbullying, combined with an AI-based mental health counseling system, stands as a testament to our commitment to creating a safer and more compassionate digital society. By empowering individuals, raising awareness, and providing effective support mechanisms, we aim to combat cyberbullying and promote the overall well-being of individuals in online spaces.