A Synopsis

of

Minor Project [CC3270]

**Suicidal Tendency Detection Chatbot**

Submitted to Manipal University Jaipur

towards the partial fulfillment of the requirement for the award of the degree of

**BACHELOR OF TECHNOLOGY**

in

Computer and Communication Engineering

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**Synopsis**

## Introduction

Suicide is a major global concern, with millions of individuals suffering from mental health issues that may lead to self-harm. Identifying suicidal tendencies at an early stage is crucial for timely intervention. This project focuses on developing a **Suicide Detection Chatbot** that predicts whether a person is suicidal or not based on textual input. The chatbot utilizes **Deep Learning** techniques to analyse and classify conversations, enabling proactive support for at-risk individuals.

The chatbot is trained using a dataset from **Kaggle** that contains real-life conversations from individuals exhibiting suicidal tendencies. By leveraging **Natural Language Processing (NLP)** and **Machine Learning (ML)** models, the chatbot can effectively detect distress signals and suggest appropriate intervention strategies. The chatbot is designed to be deployed as a **web-based application**, making it easily accessible to users.

## 2. Motivation

## The rise in suicide rates, particularly among young individuals, necessitates the development of intelligent systems for early detection and intervention. Many people hesitate to seek help due to stigma and societal pressure. A chatbot provides a non-judgmental, accessible, and anonymous platform to detect distress signals and encourage individuals to seek professional help.

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## Additionally, existing psychological assessments and helpline services are not scalable to handle the growing number of individuals who require assistance. A chatbot-based solution can address this gap by providing real-time analysis and immediate recommendations, making it a valuable tool in suicide prevention efforts

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## 3.Project Objectives

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## Objectives:

## To develop a chatbot capable of detecting suicidal tendencies through textual interactions.

## To train a deep learning model using the dataset available on [Kaggle](https://www.kaggle.com/datasets/nikhileswarkomati/suicide-watch).

## To implement a user-friendly interface for real-time interaction.

## To ensure privacy and anonymity while maintaining accuracy in detection.

## To integrate the chatbot with crisis helplines for immediate human intervention when necessary.

## Pros & Cons of Existing Methods:

## Existing Methods:

## Traditional surveys and psychological evaluations.

## Machine learning models trained on limited datasets.

## Helpline services providing real-time human intervention.

## Manual screening of social media and online forums.

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## Advantages of the Proposed Method:

## Automated and scalable solution for suicide risk detection.

## Available 24/7, ensuring immediate response.

## Data-driven insights for early intervention.

## Can analyze large volumes of text in real-time.

## Limitations:

## Dependence on textual data; may not capture non-verbal cues.

## Ethical concerns regarding false positives and false negatives.

## Need for continuous retraining to adapt to new language patterns.

## 4. Methodology/ Planning of Work

## Data Collection: Acquire and preprocess the dataset from Kaggle, including text cleaning, tokenization, and vectorization.

## Model Development: Train a deep learning model (e.g., LSTM, BERT) for text classification using labeled data.

## Chatbot Development: Integrate the trained model with a chatbot framework such as Dialogflow or Rasa.

## User Interface: Develop a web-based and mobile-friendly UI using React.js and Flask/Django.

## Testing and Validation: Evaluate the model’s accuracy using precision, recall, and F1-score metrics.

## Deployment: Deploy the chatbot on cloud platforms like AWS/GCP/Azure.

## Integration: Connect the chatbot to helplines and mental health resources.

**Gantt Chart**:

|  |  |
| --- | --- |
| **Task** | **Timeline(weeks)** |
| Data Collection | Week 1-2 |
| Preprocessing | Week 2-3 |
| Model Training | Week 3-4-5 |
| Chatbot Dev. | Week 4-5-6 |
| UI Design | Week 6-7-8 |
| Testing | Week |
| Deployment | Week |
| Integration |  |

**Facilities Required for Proposed Work**

**Software Requirements:**

* **Python** (TensorFlow, PyTorch, Scikit-learn, NLTK, Hugging Face Transformers)
* **Flask/Django** for chatbot deployment
* **React.js** for frontend development
* **MongoDB/PostgreSQL** for storing user conversations

**Hardware Requirements:**

* **GPU-enabled system** for deep learning model training
* **Cloud-based deployment** (AWS/GCP/Azure) for hosting the chatbot

**Bibliography/References**

1. Nikhileswar Komati, "Suicide Watch Dataset," [Kaggle Dataset](https://www.kaggle.com/datasets/nikhileswarkomati/suicide-watch).
2. Hochreiter, S., & Schmidhuber, J. (1997). "Long short-term memory." Neural computation, 9(8), 1735-1780.
3. Vaswani, A., et al. (2017). "Attention is All You Need." Advances in Neural Information Processing Systems.
4. World Health Organization (2021). "Suicide prevention strategies: a global perspective."
5. Devlin, J., Chang, M. W., Lee, K., & Toutanova, K. (2018). "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding."

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**Title page:**

1. Proposed Title

2. Name of Student

3. Branch

4. Roll Nos.

5. MUJ logo

6. Supervisor name

7. Department name

8. Full name of the university with address

**Introduction**

(should not exceed 1 page)

**Motivation**

(should not exceed 1 page)

**Problem Statement**

(with Objectives, Pros & Cons of existing methods – if any)

**Methodology/ Planning of work:**

(Methodology will include the steps to be followed to achieve the objective of the project during the project development. Planning of work should be presented with the help of neat and clean GANTT Chart.)

**Facilities required for proposed work:**

(Software/Hardware required for the development of the project.)

**Bibliography/References**