

An Innovative Emotion Recognition and Solution Recommendation Chatbot

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Abstract—The proposed chatbot for emotion recognition and solution recommendation system is a web-based application that aims at helping people to handle their emotions without any external assistance. In today's world, pressure and stress on the professional front, insecure relationships, and other factors produce a lot of mental turmoil, which many prefer not to discuss with others. The proposed system simulates a one-on-one interaction of the user with the chatbot through images, category selection, and text data describing the mood of the person. The user's text description of emotion is analyzed using a variety of machine learning algorithms and parameters, with Random Forest proving to be the most precise in recognizing emotion with accuracy and F1 score of 97.55 and 0.969, respectively. This facilitates recognizing subtle and hidden emotions to recommend better ways of handling the emotions. The proposed chatbot uses state of art technology to analyze the mood of the user using multiple inputs and recommends different ways of controlling the emotion.

Keywords—chatbot; emotion recognition; natural language processing; recommendation system; machine learning; web-based application; sentiment analysis; text classification

I. INTRODUCTION

Artificial intelligence (AI) is the ability of a computer chatbot to accomplish activities that are commonly performed by humans and are associated with human intelligence [1]. A chatbot is an application that uses AI and Natural Language Processing (NLP) to understand the users and simulate a human-like conversation over the internet, forums, tablets, and message applications. In chatbots, Machine Learning (ML) and NLP are used along with AI mechanisms to provide an interactive environment to the user [2]. NLP plays a major role in making the chatbots accept input questions, analyze the received text, and respond by

generating the output text. NLP allows computers to derive meaning from user input. In case of chatbots, it evaluates user input and then generates replies based on contextual analysis, much like humans.

A. Types of Chatbots

In general, chatbots can be classified into rule-based chatbots and conversational chatbots. Rule-based chatbots operate within some pre-defined rules and are limited in their scope of activity. These rules are used to train the chatbots, develop a response system, and help the chatbot to get an idea about the questions. In rule-based chatbots, the questions are mapped to the corresponding response that will be given as output. Conversational chatbots rely on NLP to extract information from user's text and respond with the most appropriate replies. They use AI to improve the accuracy of the response over time [3]. Chatbots are widely used for different business applications like flight booking and FAQ agents [4].

B. Emotions and Need for Psychotherapy

Emotions are how the brain interprets body feelings based on previous experiences. Almost everyone experiences diverse emotions such as joy, anger, fear and so forth. They have a significant impact on how individuals think and act. Despite its importance on a person's overall health, nearly two-thirds of the population with mental health problems never seek treatment, and one out of every four people are likely to experience mental or neurological issues at a certain point in life. Many do not receive treatment for various reasons, including lack of availability of assistance or increasing need for counselling and hesitance in discussing the issue. Not reaching out for help may further worsen the situation leading to suicidal and self-harm tendencies, but not everyone can afford the time or money for professional help