Sentiment Analysis of Incoming Calls on Helpdesk

A PROJECT REPORT

Submitted by,

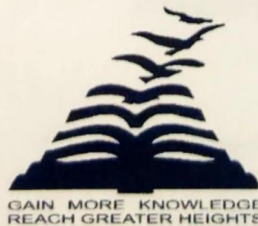|	
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Under the guidance of,

Mr. YAMANAPPA

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

At

GAIN MORE KNOWLEDGE
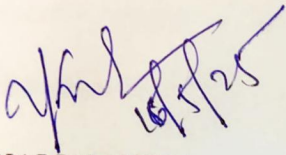REACH GREATER HEIGHTS

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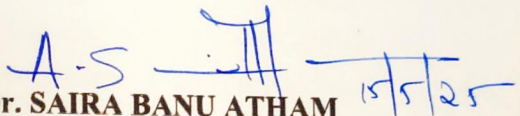
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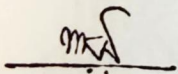
CERTIFICATE

This is to certify that the Project report **"Sentiment Analysis of Incoming Calls on Helpdesk"** being submitted by "SIDDHARTHA G, ANKITA H S, KEERTHANA, SHAIK MOHAMMED ADIL" bearing roll number "20211CSD0034, 20211CSD0036, 20211CSD0049, 20211CSD0013" in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a bonafide work carried out under my supervision.
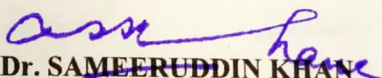
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DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **"Sentiment Analysis of Incoming Calls on Helpdesk"** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering**, is a record of our own investigations carried under the guidance of **Mr.YAMANAPPA, Assistant Professor, School of Computer Science Engineering, Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

Name	Roll No	Signature of the Students
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ABSTRACT

The proposed project entails a comprehensive audio-based sentiment analysis system that employs state-of-the-art NLP and deep learning techniques to extract and identify the emotional quality of spoken language. The system is packaged with a Kivy-based graphical user interface (GUI) for ease of use with real time or file-based audio input and uses Google Speech Recognition for transcription and a fine-tuned BERT (Bidirectional Encoder Representations from Transformers) for sentiment classification. The pipeline begins with normalizing and cleaning the raw input text and implements preprocessing steps such as: tokenization, removal of stopwords, and lemmatization for aggressive pre-processing of the text. A labeled dataset would be used to train and tune the system employing a BERT-based transformer classifier which would learn to classify the transcriptions into one of three categories: positive, negative, or neutral. During training, label encoding and other training optimizations (e.g., adjusting the learning rate depending on training loss and/or epoch) are to be utilized. After training, the model, tokenizer, and label encoder are serialized in such a way as to be integrated without complications into the GUI.

The application provides multiple modes of interaction via the user interface: text entry, live voice recordings, and audio files uploaded by the user. The speech is transcribed, analyzed for sentiment, and displayed to the user in a visual form automatically upon receiving the voice. Each interaction may be stored locally as a CSV file, with timestamps for the conversation that allow for future reference or analysis. This is an important feature for applications related to customer service, call center support, and mental health monitoring. The project brings together transformer-based deep learning, voice processing, and interactive application design within a single solution to understand and interpret human sentiment through the modality of voice. The modular design also allows for future work to easily be added to the solution, such as multilingual working capabilities, intense sentiment score products, or real-time conversation analysis. This system demonstrates the intersection of state-of-the-art NLP models and intuitive user interface design for the purpose of providing a tool with sophisticated voice analysis related to sentiment.

ACKNOWLEDGEMENT