AI BASED CHATBOT USING NLP

A PROJECT REPORT

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Under the guidance of,

Mr. JOHN BENNET J

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING
(ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

At

PRESIDENCY UNIVERSITY

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PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE & ENGINEERING

CERTIFICATE

This is to certify that the Project report **"AI BASED CHATBOT USING NLP"** being submitted by "Bharath Chandra, Pavan Kumar Reddy, Michanagatla Vamsi, T Sai-Charan, Talari Dileep Kumar" bearing roll number(s) "20201CAI0083, 20201CAI0084, 20201CAI0120, 20201CAI0145, 20201CAI0149" in partial fulfillment of requirement for the award of degree of Bachelor of Technology in Computer Science and Engineering (AI & ML) 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 **"AI BASED CHATBOT USING NLP"** in partial fulfilment for the award of Degree of **Bachelor of Technology** in **Computer Science & Engineering(AI & ML)**, is a record of our own investigations carried under the guidance of **Mr. John Bennet J, 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.

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ABSTRACT

A chatbot is an innovative tool powered by artificial intelligence, designed to simulate human interaction. By interpreting information and providing responses in either written or spoken form, chatbots have become indispensable in the realm of digital communication. Our revolutionary concept delves into the untapped potential of chatbot communication, paving the way for further research in this field. While most chatbots efficiently complete tasks, one recurring issue remains: the conversations can be repetitive. To tackle this, our project introduces a multi-agent system where a chatbot acts as a mediator between the user and the external world. What sets our chatbot apart is its unique ability to comprehend the user's needs and tailor responses accordingly, making technology even more efficient in minimizing human effort.

In today's world, advanced technology primarily operates through the collaboration of artificial intelligence, NLP processing, and machine learning algorithms. An essential aspect of this complex network is the use of artificial intelligence to simulate human decision-making and offer various services. As such, this paper presents a survey of chatbots and their role in artificial intelligence research. It examines the different platforms utilized to construct chatbots and their ability to serve a diverse range of users. Additionally, the design techniques employed to create chatbots vary depending on the specific services intended for the users.

The chatbot utilizes a knowledge base to compare the user's input sentence with existing patterns. When users ask questions, the chatbot uses these patterns to understand the question and provide an appropriate response. This is achieved by transforming the English sentence into a format that can be interpreted by the machine, then searching through relevant data to retrieve the necessary information and presenting it in a conversational manner. The chatbot is also equipped with the ability to identify commonly asked questions that it cannot answer, and it will notify an administrator for their input. Once the administrator provides a response, the chatbot will learn and improve, actively searching for new questions and corresponding answers to provide to users.

The chatbot's cleverness lies in its ability to combine rule-based matching and a pre-trained GPT-2 language model to generate responses. These rules and their corresponding answers are stored in a convenient JSON file. Each time a user sends a message, the chatbot first scans these rules for a match. If it finds one, it instantly reply back with the corresponding response from the JSON file. If

no match is found, the GPT-2 model seamlessly takes over to generate a response. To accurately identify key words from the user's input, the chatbot utilizes the powerful Spacy library. These words are then used to search for matching rules. Additionally, the chatbot scores potential responses based on how closely they align with the user's message, using the TF-IDF vectorization and cosine similarity method. This ensures that the chatbot's responses are both relevant and engaging

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