Design of Chatbot using Deep Learning

Nivila A[1], Sujitha S[2], Prithika N[3] , Gnana prakash V[4]

[1]Student, Department of Information Technology, Bannari Amman Institute of Technology, Erode, Tamilnadu, India
[2]Student, Department of Information Technology, Bannari Amman Institute of Technology, Erode, Tamilnadu, India
[3]Student, Department of Information Technology, Bannari Amman Institute of Technology, Erode, Tamilnadu, India
[4]Guide, Department of Electronics and Communication Engineering, Bannari Amman Institute of Technology, Erode, Tamilnadu, India

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Abstract - Chatbots are items of software package that use Natural process (NLP) to succeed in intent on humans. the event of voice communication may be a crucial component of any Chatbot. The implementation of Associate in Nursing honest Chatbot model remains a big challenge, despite recent advances in information science and AI (AI). It is typically used for a spread of tasks. Generally, it ought to perceive what the user is making an attempt to accomplish and respond consequently. Until now, a inordinateness of options are introduced that have considerably improved the informal capabilities of chatbots. This paper proposes some way for developing a chatbot supported deep neural network. the data is learned and processed employing a neural network bedded with multiple layers. The novelty of the projected model is that, the bot are typically trained on any computer file supported the user's wants and needs, which means that it had been a generalized one. Text to speech conversion is additional to make it a lot of user friendly.

Key Words: AI , Chatbot, natural language, Neural Network.

1. INTRODUCTION

A chatbot could also be a chunk of AI (AI) software package that simulates a linguistic communication voice communication between a user Associate in Nursing and interface, sort of a web site, a mobile app, or a phonephone. In the context of human-machine interaction, chatbots are typically mentioned united of the foremost advanced and promising strategies. Not with standing, from a technological viewpoint, a chatbot is simply associate in Nursing NLP-enabled question and answer system.

Currently, there are 2 basic models used within the development of a chatbot i.e., models that are generative and retrieval in nature. As deep learning and AI have advanced in recent years, strategies supported written directions or patterns and applied mathematics strategies have quickly become obsolete. Conversation agents are ordinarily used by government administrations, businesses, and non-profit organizations. They are usually organized by monetary establishments like banks, on-line retailers, insurance corporations, start-ups, and work suppliers.

These chatbots are used by each massive businesses and little start-ups. Text messages, applications, or instant messages are typically wont to communicate with a chatbot to help patients. Among the market, there are varied choices for virtual bot development.

The matter with each model is their inflexibility and lack of usefulness once it involves real conversations. Google Assistant, Alexa, and Cortana, 3 of the well-known intelligent personal assistants, have some limitations in practicality. a replacement form of retrieval-based agent is being introduced to facilitate human-like conversations. Many good personal assistants nowadays rely upon rule-based or retrieval-based techniques designed to deliver higher results. Chatbots have recently gained a giant quantity of recognition. the employment of bots by businesses to fulfill their customers' wants is changing into more and more well-liked. Businesses are adopting chatbot technology in larger number, therefore there is Associate in Nursing increasing demand for advanced analysis and development of informal agents.

1.1 LITERATURE SURVEY

Making the spoken language between the system and also the user feel human-like and natural may be a crucial challenge within the style of a chatbot.Variety of models with CUI (conversational user interfaces), like virtual bots, mimic the human response method by delivering delayed responses or replies. However, a delayed response will have a nasty impact on user satisfaction, particularly once fast responses are expected, like throughout client interactions.

The paper [1] presents a chatbot that was created for a university web site. On a college's web site, it is common to be uncertain of wherever to appear for data. It becomes troublesome to get data for somebody United Nations agency is not a student or worker at the university. These issues is solved by implementing a university inquiry chatbot, a fast

and informative tool additional to varsity websites to boost the user expertise and supply users with correct data.

The paper [2], provides an outline of the technologies behind chatbots, together with data Extraction and Deep Learning. They mentioned that, "conversational chatbots" are trained supported free-form chat logs whereas "transactional chatbots" ar outlined in a very manual manner to accomplish a specific goal, like booking a flight on-line. additionally, they offered associate degree summary of business tools and platforms for developing and deploying chatbots.

An interactive chatbot for medical functions acts as a virtual doctor, in keeping with a paper printed in [3]. exploitation pattern matching algorithms and human language technology, this chatbot was in-built Python. The chatbot answered eighty percent of the rightqueries in a very survey assessing its performance, whereas twenty percent were ambiguous or incorrect. These results purpose to the potential use of the chatbot as each a virtual doctor for care and awareness, in addition as for teaching medical students.

According to [4], respondent long conversations exploitation retrieval-based chatbots may be a challenge. Primary goal is to match a response candidate to a conversation's context; the challenge is to spot key items of context in this case and to implement the relationships between speeches in it. typical matching ways might not capture key aspects of contexts. The authors planned a framework referred to as a consecutive matching framework (SMF), and it will effectively match the relations between speeches by taking vital data from the contexts.

The purpose of paper [5] was to use human language technology to form a chatbot to help new analysis students. Inexperienced researchers usually haven't any plan wherever to begin, the way to begin, and often have questions about elementary ideas in analysis, funding agencies, information sources, etc. Researchers would like a virtual assistant to assist them and also the author describes a chatbot model that will offer answers to their analysis queries.

The authors examines the technique, nomenclature, and varied platforms employed in the look and development of a chatbot [6]. It additionally includes some real-world, typical applications and examples. It suggests that the chatbot tool is used for software package (CAD) applications.

This paper presents associate degree human language technology and Deep Learning based mostly chatbot which may communicate with humans. The bot may be a generalized one, that means that the {input information|input file|computer file} or the coaching data is modified as per user's or any company's demand. Minimum changes ar to be created whereas implementing the model on a selected or new information.

1.2 PROPOSED SYSTEM

The chatbots are unit colloquial virtual assistants that alter interactions with the users. Chatbots are a unit battery-powered by computer science exploitation machine learning techniques to grasp tongue. The most motive of the paper is to assist the users relating to minor health info. Once the user's visits the web site first registers themselves and later it moves to interact withuser
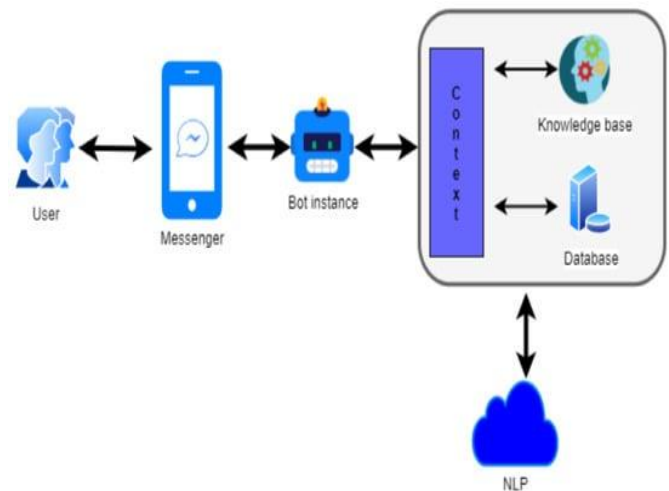

Fig -1 : Proposed workflow

The system uses the Associate in Nursing professional system to answer the queries if the solution isn't given within the information. Here the domain specialists additionally ought to register themselves by giving varied details. The info of the chatbot keeps the information within the variety of pattern-templates. Here SQL is employed for handling the information.

2. METHODOLOGY

Deep learning is one in all the parts of Machine Learning. The goal of deep learning is to be told from the structures of the brain. Algorithms that use deep learning analyzes information unceasingly supported a preset logical structure to draw similar conclusions as humans. Neural network, a multi-layered structure of algorithms, permits it to realize this.

Even as the human brain acknowledges patterns and categorizes varied styles of data, neural networks will be educated to try and do identical. The bot offers the most effective answer in keeping with user's input from the list of coaching information from that the bot hash learned.

The dataset consists of a JSON file containing a wordbook. It chiefly contains "Tags", "Patterns" and "Responses". The tags embrace the keys, such as acquaintance, greeting, annoying, author etc. The model consists of three hidden layers, every with fifteen neurons. A Graphical interface (GUI) additionally

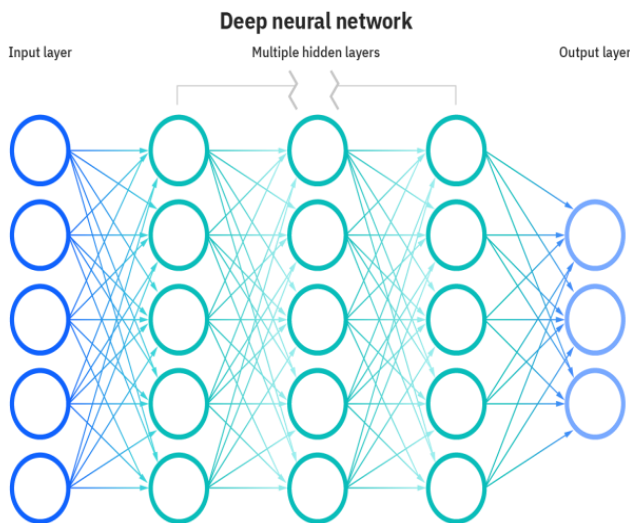provided for higher aesthetic functions and also to create the language additional easy.

Fig -2: Neural Network with 3 hidden layer

The diagram of the model is conferred in Fig. 2. Once the input is given by the user, the model first of all tokenizes the input, (Tokenization is that the method of dividing a bit of text into smaller units called tokens. Tokens will be characters, words, or sub-words during this context) so it converts those into computer memory unit streams i.e., 0's and 1's. This methodology is termed as pickling or publication.

Thereafter, it compares the given input with the information from that the bot was trained, and it calculates the chance of that particular input with each and every tag. The pattern with the best chance tag is taken into thought and compared with a threshold confidence level (0.85). If this tag contains a chance larger than the threshold, then any of its responses is displayed on the interface employing a random function. The audio feedback is given consequently. This method continues until the user sorts "Quit" or "quit" to finish.
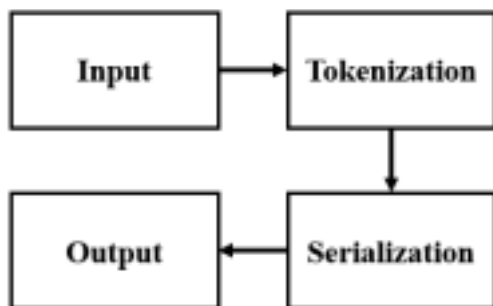

Fig -3: Block diagram of chatbot

The coaching information will even be modified to suit user's demand or any company's needs. the most libraries used are: NLTK, Pickle, TFLearn, Tkinter and gTTS. There area unit many libraries and programs within the linguistic communication Toolkit (NLTK) for applied math language process. IP is employed as a result of it permits machine to know text and spoken words within the same means as humans.

Pickle may be a Python module for serializing and de-serializing structures. TFLearn may be a deep learning library with a higher- level TensorFlow API. It may be a Tensorflow-based on the clear deep learning library. Tkinter may be a Python's commonplace interface library. Python, once combined with Tkinter, provides a fast and simple thanks to produce interface applications. gTTs stands for google text-to-speech. it had been wont to convert text i.e., bot's response to speech.

3. RESULTS

The bot gave an accuracy of 98.24%. Most of the questions were correctly answered by the bot, while some of the answers were incorrect on the data which wasn't trained or on the part which the bot couldn't understand.
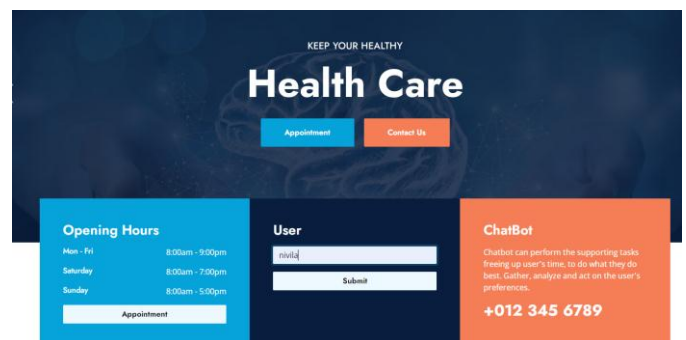

Fig -4: Login

Fig 4 shows that we need to type the user name and give enter. By entering that we are directed to chatbot page.
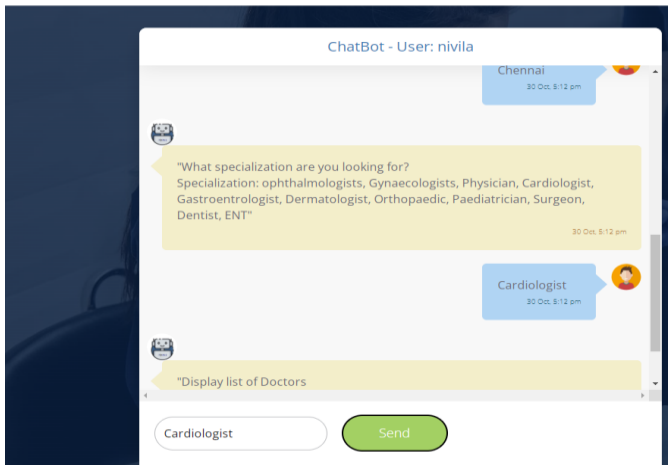

Fig -5: Chatbot Interaction
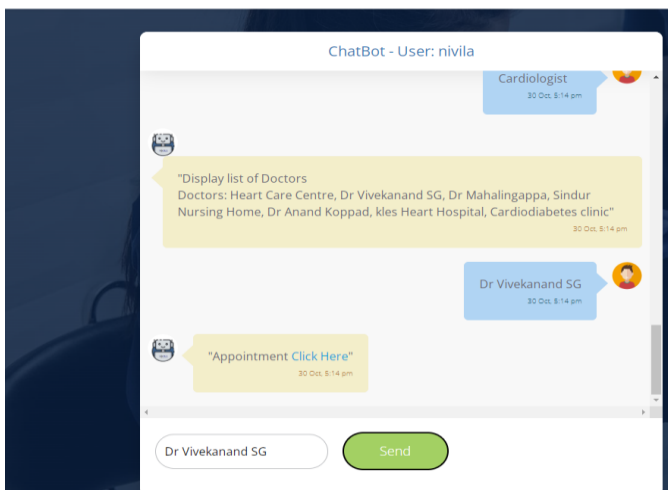
Fig -6: Chatbot Interaction

Fig -7: Chatbot Interaction

In fig 7, if we need to book appointment to the concern doctor , we need to click appointment.

Fig -8: Making appointment

Fig -9: Appointment section

In appointment section, we can check what are the appointments in the admin login. Overall, the bot gave good results as expected.

4. CONCLUSIONS

This paper conferred a Chatbot for human-machine language. The bot performed well and gave sensible accuracy. Since the technology is increasing with leaps and bounds, and computer science is seizing the planet, thus there's Associate in Nursing increasing would like for chatbots and android robots. Though there area unit some limitations of a chatbot, they can't be avoided because of their direct link with the expansion of a business and revenue generation. Because of their 24*7availability, several of the purchasers have an interest in connecting with chatbots. Despite all of the restrictions,additional and additional corporations area unit investment in chatbot technology as a result of they apprehend that this technology can be revolutionize the planet. In future, the bot may be created multi-Linguistic, additionally voice recognition like Google Assistant or Amazon's Siri may be supplementary.

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