



Advanced Chatbot Design with AI using Deep Learning

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Abstract: - Chatbots are software products that rely on natural language processing (NLP) to successfully communicate with humans. Voice communication might be one of the most important features of any chatbot. Despite recent advancements in information technology and artificial intelligence (AI), implementing the Associate in Nursing honest Chatbot paradigm remains a significant problem. Usually, it is employed for a variety of purposes. In general, it should recognize what the user is trying to do and react appropriately. Up to now, an excessive number of choices have been added, greatly enhancing chatbots' informal skills. This study suggests a method for creating a deep neural network-supported chatbot. The information is acquired and handled using a multi-layered neural network. The projected model is innovative in that the bot is trained on any computer file that satisfies the user's needs and desires, implying that the model was generalized from the start. Adding text to speech conversion makes it even more user-friendly.

Key Words – Chatbot, Deep Learning, AI, Neural networks, Natural Language.

I. INTRODUCTION

A chatbot can also be a portion of artificial intelligence (AI) software that mimics voice and language interactions between a user and an interface, such as a website, mobile app, or phone. When it comes to human-machine connection, chatbots are usually recognized as one of the most cutting-edge and promising approaches. Notably, a chatbot is just an NLP-enabled question and response system for nursing from a technology perspective.

There are now two fundamental models utilized in the creation of chatbots: retrieval and generative models. tactics that relied on written instructions or patterns, as well as applied mathematics tactics, have rapidly become outdated as deep learning and artificial intelligence (AI) have improved in recent years. Conversation agents are typically employed by corporations, non-profits, and government agencies. Usually, financial institutions such as banks, internet merchants, insurance companies, startups, and labour providers are in charge of organizing them.

Every model has a flaw in that it is rigid and unhelpful when it comes to having actual talks. Three well-known intelligent personal assistants (Alexa, Cortana, and Google Assistant) have some practical constraints. To enable human-like dialogue, a replacement type of retrieval-based agent is being introduced. These days, a lot of effective personal assistants depend on rule- or retrieval-based strategies that are meant to provide better outcomes. Chatbots have become quite popular in recent times. The use of bots by companies to satisfy consumer requests is becoming more and more common. Companies are implementing chatbot technology more often, which means that there is a growing need for sophisticated analysis and the creation of informal agents.

Proposed System:

The chatbots, which are virtual assistants with a colloquial style, modify user interactions. Chatbots are computer science-powered devices that use machine learning techniques to understand human speech. The primary goal of the document is to help consumers with minimal health information. When a visitor enters the website, they must first register before they may engage with it.

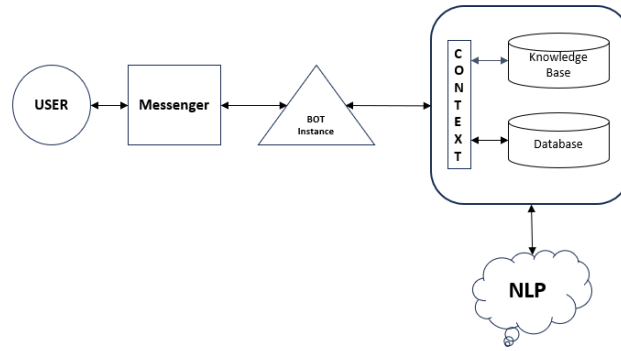


Fig - 1: Proposed Workflow

If the answer isn't provided in the information, the system utilizes the Associate in Nursing professional system to respond to the inquiries. The domain experts should also register here by providing a variety of details. The chatbot's information is stored in a variety of pattern-templates. Here, the information is handled via SQL.

II. METHODOLOGY

One component of machine learning is deep learning. Deep learning aims to tell stories from the brain's architecture. Deep learning algorithms continuously evaluate data in support of a predetermined logical framework in order to reach conclusions that are comparable to those made by humans. It is able to do this because of neural networks, which are multi-layered structures of algorithms.

Neural networks will be trained to attempt to recognize patterns and classify different types of data in the same way that the human brain does. Based on the user's input and the coaching information list that the bot has learnt, the bot provides the most optimal response.

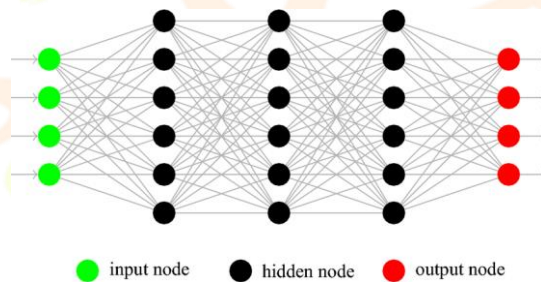


Fig - 2: Neural Network with 3 hidden layers

The model's schematic is shown in Fig. 2. Following the user's input, the model initially tokenizes the data. Tokenization is the process of breaking up a text passage into smaller pieces known as tokens. It transforms tokens (which in this case are words, characters, or sub words) into computer memory unit streams, or 0s and 1s. We refer to this process as pickling or publishing.

After that, it computes the likelihood of each input with each tag by comparing the supplied input with the data from which the bot was trained. A threshold confidence level of 0.85 is used to compare the pattern with the best chance tag. Any of the replies to this tag that have a chance greater than the threshold are shown on the interface using a random function. As a result, the audible feedback is provided. This process keeps on until the user sorts "quit" or "quit" to be done.

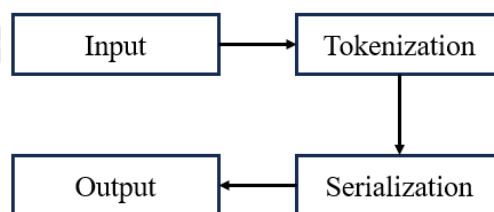


Fig - 3: Block diagram of chatbot

Even the teaching material will be changed to accommodate user requests or business requirements. The libraries that are used the most include gTTS, TFlearn, Pickle, NLTK, and Tkinter. The Linguistic Communication Toolkit (NLTK) is a collection of several libraries and tools for applied mathematics language processing. IP is used because it enables machines to understand spoken and written language in the same way that people do.

A Python package called Pickle may be used to serialize and deserialize structures. TFLearn may be a TensorFlow API-level deep learning library. It may be a clear deep learning library based on Tensorflow. Python's standard interface library may be Tkinter. When Python and Tkinter are used together, creating interface apps is quick and easy. The acronym for Google Text-to-Speech is gTTs. It was customary to translate text that is, a machine's vocal response to text.

III. RESULTS AND DISCUSSION

The bot provided a 98.24% accuracy rate. While the bot provided accurate responses to the majority of the queries, there were some wrong replies based on untrained or incomprehensible material.

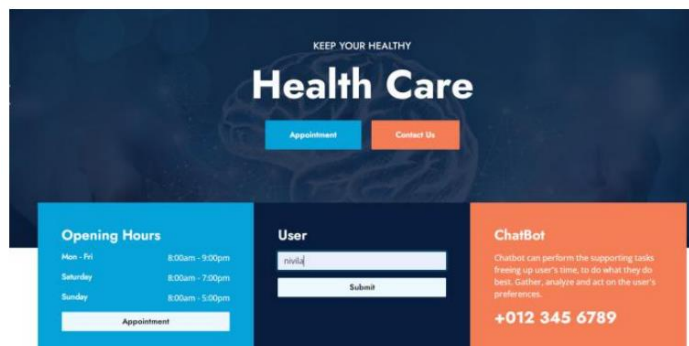


Fig - 4: Chatbot Login Page

As seen in Fig. 4, we must type the username and press Enter. We are sent to a chatbot website after entering that.



Fig - 5: Chatbot Interaction



Fig - 6: Chatbot Interaction

Health Care

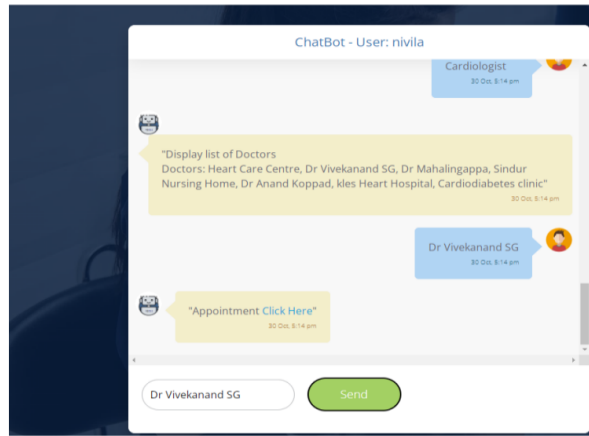


Fig - 7: Chatbot Interaction

To schedule an appointment with the concerned physician, use the appointment button in Figure 7.

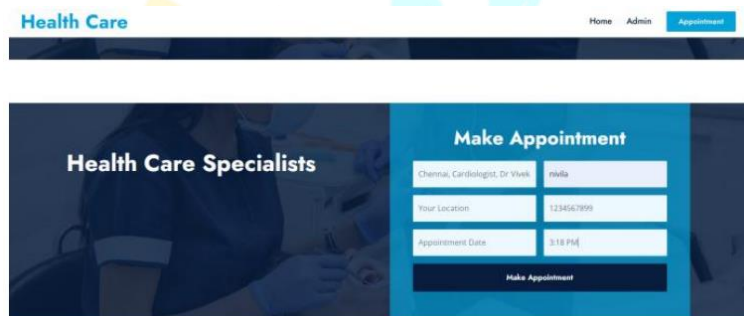


Fig - 8: Making appointment

#	Date / Time	Service	Patient	Action
1	10/28/2022 6:30 AM	Chennai, Cardiologist, Dr Anand Koppad	nivila chennai 9787675689	Cancel
2	10/28/2022 5:24 PM 10/27/2022 5:24 PM	Chennai, Gynaecologists, Dr. Meena R Kalghata	Kumar Chennai 8807655342	Cancel
3	10/28/2022 5:20 PM	Kumar	Kumar Chennai 8807655342	Cancel
4	10/28/2022 10:30 AM	General Checkup	Dinesh Madurai 9876543210	Cancel

Fig - 9: Appointment section

We can view the appointments via the admin login under the appointment area. As anticipated, the bot produced decent results overall.

IV. CONCLUSIONS:

In this paper, a chatbot for human-machine language was developed. The bot did a good job and provided accurate results. With the rapid advancement of technology and the global takeover of computer science, there is a growing need for chatbots and android robots among Associate in Nursing students. Even though chatbots have obvious limits, it is impossible to ignore them given their close relationship to corporate growth and income generating. Many of the buyers are interested in interacting with chatbots since they are available around-the-clock. Despite all of the limitations, more and more businesses are investing in chatbot technology because they believe it has the potential to completely transform the world. The bot may be developed in the future to be multilingual, and it might also have speech recognition features similar to those of Google Assistant and Amazon's Alexa.

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REFERENCES

- [1] Nivila A, Sujitha S, Prithika N, Gnana prakash V. "Design of Chatbot using Deep Learning", International Research Journal of Engineering and Technology (IRJET) – 2022, pp: 1105–1109.
- [2] Neeraj Singh Kadayan, Aditya Dave, Vinit.K. "CHATBOT USING DEEP LEARNING", Journal of Emerging Technologies and Innovative Research (JETIR) – 2019 pp: 137-141.
- [3] Jincy Susan Thomas and Seena Thomas. Chatbot Using Gated End-to-End Memory Networks. In Proceeding of IRJET. March 2018.
- [4] Hao Zhou, Minlie Huang, Tianyang Zhang, Xiaoyan Zhu and Bing Liu. Emotional Chatting Machine: Emotional Conversation Generation with Internal and External Memory. In Proceeding of Association for the Advancement of Artificial Intelligence 2018.
- [5] Alessandro Sordoni, YoshuaBengio, Hossein Vahabi, Christina Lioma, Jakob G. Simonsen and Jian-Yun Nie. A Hierarchical Encoder-Decoder for Generative Context-Aware Query Suggestion. In Proceeding of 24th ACM International Conference on Information and Knowledge Management (CIMK 2015), Melbourne, Australia.
- [6] Iulian V. Serban, Alessandro Sordoni, YoshuaBengio, Aaron Courville and Joelle Pineau. Building End-to-End Dialogue Systems Using Generative Hierarchical Neural Network Models. In Proceeding of 13th AAI Conference on Artificial Intelligence (AAAI-16), pages 3776-3783.
- [7] Chae Won Park and DaeRyongSeo. Sentiment Analysis of Twitter Corpus Related to Artificial Intelligence Assist ants. In Proceeding of 5th International Conference on Industrial Engineering and Applications 2018, pages 495- 498.

