A Thorough review on Med Bot using Deep Learning

Mahesh Kamble, Guided by Prof. Nagaraju Bogiri

Mahesh Kamble, Dept of Computer Engineering, K J College of Engineering and Management Research, Maharashtra, India

Prof. Nagaraju Bogiri, Dept of Computer Engineering, K J College of Engineering and Management Research, Maharashtra, India

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Abstract - *Good heath is one of the most important and an essential aspect of any individual's life. Being healthy and fit is an amazing experience and can improve the quality of life of a person considerably. Health is most of the times equated to wealth which is a very apt comparison as having a good health can have a myriad range of benefits that are irreplaceable. The health allows the individual to achieve increased productivity and the peace of mind that is difficult to achieve in a compromised health. With the recent pandemic and the rise in the number of individuals that are suffering from various illnesses which can be attributed to the lifestyles which have become hectic and highly stressful. This makes the individuals highly susceptible to infections and other diseases which can detrimental to their overall well being. There is also a high demand for achieving remote diagnosis which can be helpful for the doctor as well as the patients. Therefore, the previous approaches on this topic have analyzed effectively implement the paradigm of Disease prediction and suggestion through the realization of a medical Chatbot which will be detailed in the next set of research papers on this paradigm.*

Key Words: **Pearson Correlation, k Nearest Neighbors, Linear Regression, Hidden Markov Model and Decision Tree.**

1.INTRODUCTION

A good health is extremely vital to the overall well being and the improvement in day to day activities and tasks that are performed by that individual. Being healthy allows the person to work at their maximum potential which can lead to a much satisfying experience. The maintenance of health is a complex and a conscious endeavor which requires an individual to lead a very healthy lifestyle. But due to the activities of the modern world, there are a considerable section of the population that do not lead a very healthy life and have a lifestyle that does not allow for an effective maintenance of the health. This has led to a considerable increase in the illnesses and other ailments that could have been prevented by leading a better lifestyle.

The increase in the illnesses have been noticed across the world with the development of the cities and the lack of work and life balance. This kind of lifestyle leads to a lot of stress and the lack of care for one's health. Health care system is among the motivating factors that might impact a person's ability to make effective use of certain available resources to them. Medical management might be tremendously advantageous in a multitude of areas, particularly effective technological developments and a significant rise in living standards of the people. As a consequence, medical organizations and the bio medicine industry have been recognized as among the field's biggest important and important themes. Large-scale innovations have primarily focused on medical breakthroughs that have been shown to be effective in extending and enhancing a human's life expectancy. This has only been accomplished by routinely preserving human health and removing extremely damaging ailments and serious disorders.

The advancements are and have been immensely valuable in maintaining human health and wellness potentially fatal disorders. Scientists may now facilitate the learning and collaborate on countless novel therapies and other precautionary measures in a relatively short time thanks to the emergence of the digital service, which has made significant contributions to this field of study. The notion that the World Wide Web has aroused an essentially ubiquitous response from customers, with the majority of the public being connected to this global communications architecture, has broad implications. This link has fostered increasing involvement amongst individuals since the internet infrastructure can be used for communicating effectively. As a response, a number of chatbots and other digital medical assistance websites have been created to aid the wider population with their health complications.

With the massive amount of people suffering from chronic ailments all over the globe, the medical system is under mounting pressure to provide appropriate health care to this growing population. Medical providers have been put under a lot of pressure to help these people be diagnosed and treated as quickly as possible. Physicians are under a great deal of stress due to their heavy schedule, which can result in a lot of human mistakes and other issues. Add to that the reality that almost all individuals with physical challenges are unable to travel hundreds of miles to see their doctor for a definitive reading and regular exams. As a result, this technique has been useful in comprehending past efforts for medical chatbot deployments, as well as in attaining our strategy, which will be detailed in future installments of this research.

This literature survey paper segregates the section 2 for the evaluation of the past work in the configuration of a literature survey, and finally, section 3 provides the conclusion and the future work.

2. RELATED WORKS

I. Ghafir et al. [1] presented BotDet, a revolutionary technique for detecting botnet C&C traffic. The created system (BotDet) is divided into two phases, the first of which contains developed modules for detecting suspected botnet C&C communication strategies. The second step employs an alert correlation mechanism based on voting among detecting modules. BotDet has an 82.3 % detection rate and a 13.6 % false alarm rate, respectively. Blacklist automation, which is utilized in some detection modules, depends on several intelligence inputs. This enables BotDet to identify attacks in real-time. BotDet balances the true positive and false positive rates with 82.3 % and 13.6 %, respectively, according to the assessment findings.

X. Ren et al. proposed an experimental project that used conversational agent-based interactions to enhance intelligent decision assistance during healthcare consultations. ConsultAI, an interactive chatbot assistant, was utilized to implement the proposed conversational method, which was designed to give real-time help to the occupational health physician [2]. The authors conducted field research with eight occupational health consultations to determine the practicality of ConsultAI in the context of occupational health; and the impact of ConsultAI chatbot interaction styles on the user experience. The quantitative results demonstrate that physicians rated ConsultAI's conversational interface highly in terms of information trustworthiness and technological adoption.

R. Rajkumar et al. investigated the links among Introvert and Extravert personality types, as well as their ways of learning [3]. Initially, using modified VARK surveys, a Chatbot is often used to categorize people as Introverts or Extroverts. The Chatbot participants' responses have been shown to produce high-quality data. The learners are given two minutes of visual and aural content to view in a calm environment, based on the Chatbot's classifications. While learners are seeing the information, their Beta brain waves are caught and a dataset is produced in a one-second time. This information is verified utilizing machine learning classification methods such as Naive Bayes, N48 tree, and Clustering algorithms. The suggested strategy has been built to enhance the precision of learner categorization. The suggested Bio-Inspired Chatbot requires less time than existing approaches to classify learners.

For multi-turn response selection in retrieval-depend chatbots, G. Mao et al. suggest a hierarchical aggregation network of multi-presentation. The authors create self-aggregation and matching aggregation techniques for hierarchical aggregation. Two techniques integrate multi-grained representations step by step, allowing for the distillation of high-level information and the reduction of redundancies. The authors consider the candidate answer to be a legitimate part of the context, and by including it into the model framework, they hope to enhance it. Experiments on two large-scale response selection data sets reveal that their method outperforms current best-practice methods [4]. The authors provide a visualization result to show that the model can capture important information for response selection. They next conduct ablation evaluations to investigate each module's impact, and the results support their utility and efficiency.

G. Daniel et al. [5] presented Xatkit, a multi-channel and multiplatform chatbot modeling framework. Xatkit offers a set of domain-specific languages for decoupling chatbot definition from platform-specific properties. This increases the reusability of the chatbot and makes it easier to redeploy it when the company's needs change, including the ability to update the NLU engine used during the text analysis phase. In addition to the actions and events contained in the current version of Xatkit, the runtime component may simply be updated to handle new platform-specific actions and events. Additional contributors, for example, have recently contributed Alexa and Trello to the core Xatkit team.

M. Polignano et al. introduced HealthAssistantBot, a Telegram-based conversational assistant for assisting patients in their everyday tasks. The agent was built with a modular strategy in mind so that new features can be added to it as needed. Users may track their therapies, biological parameters, receive doctor recommendations, and self-diagnose using the system [6]. The dialogue is carried out via a text-based interface, which makes it simple to interact with while also being resistant to mistakes. The interface, gateway, and server-side operations are the three primary aspects of the proposed platform's design. Each of them is self-contained to ensure strong internal coherence and little overlap with the other modules' functions.

H. Honda et al. presented deep learning strategies for learning symbolic processing and trained model methods for building question answering systems. The suggested approaches have rich representations and great resilience, and these models can learn even from small-scale data, according to experimental results on the training of symbolic processing models. The capacity to handle unknown input, especially when employing Word2Vec, will be a significant addition to artificial intelligence research [7]. Furthermore, the experimental findings of the question answering systems revealed that viable question answering systems might be constructed using Prolog knowledge bases. Using a connectionism-based strategy to build such systems will be incredibly tough.

To increase the informativeness and fluency of the generated answer, L. Zhang et al. integrate the generate-then-polish procedure into the response generation. The authors suggest a GP with two encoders, one for representing context and the other for representing the prototype, as well as one decoder for response creation and polishing. A set of experimental findings on a Chinese dialogue corpus show that their suggested model has a significant advantage [8]. On the Douban dialogue dataset, in particular, the proposed model produces state-of-the-art results.

Over linked data, A. Ait-Mlouk et al. suggested a knowledge graph-based chatbot system that is designed for community engagement [9]. Large-scale, publicly available knowledge bases, multilingual, speech-to-text, and external APIs are all utilized in the proposed KBot system. KBot also makes use of machine learning and natural language understanding technologies, such as named entity recognition, factoids, and repeated queries, as well as dialogue management. The suggested KBot has enhanced the end-to-end user experience in terms of interactive question answering and performance, according to a usability investigation. It is more practical for information retrieval, acquisition, intent classification, query comprehension, and continuous learning.

D. Carlander-Reuterfelt et al. recognized the benefits of cognitive aids in education as well as the implementation hurdles. As a consequence, they presented a chatbot named JAICOB, the students will have access to this chatbot with a user-friendly interface and a human-like experience. It can deliver information and dispel doubts regarding Data Science. The primary contribution is adapting the architecture to the real pedagogic demands of the students and being flexible in continuing a conversation. It may also be used by teachers to discover gaps in their pupils' knowledge [10]. They can also delegate the responding of all queries to Jaicob. The pedagogue is also a wonderful asset for selecting the most useful sources of information for Jaicob to feed on, resulting in a curated source of knowledge rather than a standard Google Search. The project was assessed by a group of students, and it received high marks for usability and originality.

EBER, an intelligent chatbot, was demonstrated by S. García-Méndez et al [11]. To their knowledge, this is the first system to use AIML, NLG, and SA to create a brief, contextualized conversations that serve as connectors between newscasts. EBER functions genuinely as an "intelligent radio" for amusing older people thanks to this combination. The connections between behavioral factors and sample demographics were well-defined, adding to the credibility of the user satisfaction scores. The technology enhances content characterization even for inattentive, tired, or confused persons by automatically collecting knowledge from connecting interactions with a positive attitude.

T. -Y. Chen et al. offer the YMC model, a basic yet effective method of capturing video information for the classification of user intent. The model's main principle is to mask off irrelevant areas depending on the object detection result, forcing the next classifier to focus on the important portions of the picture. In addition, the authors use Autoencoder, an unsupervised approach, to encode multi-modal information, such as the concatenation of textual and visual characteristics, into smaller dimensions [12]. The authors can not only execute faster during inference with these smaller dimensions, but they can also maintain high performance and accuracy. The findings suggest that using YOLOv4 as the object detection model improves performance marginally overusing YOLOv3 as the object detection model.

G. A. Santos et al. presented the Chatbot Management Process (CMP) as a technique for managing chatbot material [13]. It consists of six processes separated into three phases. CMP is a cyclic process that adapts to the demands of the company and is based on real-world user dialogues, which is its driving power. The CMP is a post-deployment management mechanism for machine learning chatbots. It includes steps for changing the knowledge base, building models, testing modifications, and analyzing metrics to determine the health of the chatbot. It's easy to assign tasks to employees with diverse skill sets with CMP, and each team member's responsibilities are clearly defined. The EvaTalk System, a full platform that includes both the chatbot interface and administration tools for post-deployment maintenance, was used to validate the technique. EvaTalk demonstrated that the CMP can scale to meet the needs of a high-demand chatbot with the correct tools and personnel. Also, as long as the organization's goals are well connected with measurements, the analysis phase proved to be quite crucial for the process.

E. H. -K. Wu et al. explore and analyze how well existing chatbot technologies enhance users' education on E-Learning platforms, as well as how these techniques might be leveraged to address concerns like separation and detachment. They devised a chatbot that acts as an E-Learning assistant for testing purposes. The NLP foundation of their chatbot is composed of two models: retrieval-based and QANet [14]. This hybrid chatbot with two models was designed to operate in an e-learning environment. The core answer context of their chatbot isn't just for course content, but also for general conversation and chitchat, making it seem more like a real companion.

J. G. Nangoy et al. explain their study on a chatbot that can handle picture messages and respond with product information, and they propose a method for categorizing pictures on the LINE @ platform's chatbots [15]. The system is designed to respond to buyer questions concerning a seller's product specifications. The administrator control panel is where product information is collected. The test was

carried out on four different CNN models with different layers and epochs. Model A has three layers totaling 300 epochs, model B has two layers totaling 40 epochs, model C has two levels totaling 100 epochs, and model D has two layers totaling 300 epochs. Depending on the results of these tests, the C model has the highest accuracy value when compared to the other two models.

3. CONCLUSIONS AND FUTURE SCOPE

The fast paced lifestyle has become one of the most challenging and problematic occurrences which have been affecting the populations and their health. The individuals have very less time to care for their health which can lead to a lot of problems. The paradigm of remote health management can come to the rescue in this regard. Medical chatbots can also be used to accurately diagnose illnesses related health issues reported by a patient via the internet. As a result, there is a rising demand for a remote diagnostic method that may considerably benefit the overall healthcare industry. Through the use of machine learning techniques, this autonomous chatbot can assess complaints and deliver an early diagnosis. This can cut rehabilitation time in half and offer the client with therapy in a relatively short time. A number of traditional research have been discovered and investigated in depth for the aim of completing this research survey paper. The approach achieved through this analysis has been realized which will be elaborated in the next article on this topic.

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