iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** IV **Month of publication:** April 2022

DOI: https://doi.org/10.22214/ijraset.2022.41889

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue IV Apr 2022- Available at www.ijraset.com

Efficient Chatbot Designing

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Abstract: ***A conversational agent (chatbot) is a piece of software that is able to communicate with humans using natural language. Modeling conversation is an important task in natural language processing and artificial intelligence (AI). Indeed, ever since the birth of AI, creating a good chatbot remains one of the field's hardest challenges. While chatbots can be used for various tasks, in general they have to understand users' utterances and provide responses that are relevant to the problem at hand. In the past, methods for constructing chatbot architectures have relied on hand-written rules and templates or simple statistical methods.***

With the rise of deep learning these models were quickly replaced by end-to-end trainable neural networks around 2015. More specifically, the recurrent encoder-decoder model [Cho et al., 2014] dominates the task of conversational modeling. This architecture was adapted from the neural machine translation domain, where it performs extremely well. Since then a multitude of variations and features were presented that augment the quality of the conversation that chatbots are capable of the next section of my paper focuses on adapting the very recent Tranformer [Vaswani et al., 2017] model to the chatbot domain, which is currently the state-of-the-art in neural machine translation. I first present my experiments with the vanilla model, using conversations extracted from the Cornell Movie-Dialog Corpus [Danescu-Niculescu-Mizil and Lee, 2011]. Secondly, I augment the model with some of my ideas regarding the issues of encoder-decoder architectures. More specifically, I feed additional features into the model like mood or persona together with the raw conversation data. Finally, I conduct a detailed analysis of how the vanilla model performs on conversational data by comparing it to previous chatbot models and how the additional features, affect the quality of the generated responses.

I. INTRODUCTION

The purpose of this project is to showcase the power of chatbots and how they can be an alternative to using an application or even a website. The chatbots should be easy to use, respond in a timely fashion and be all round user friendly. The bots should make the users interaction as easy and fast as possible to ensure that the users time is not wasted and that they get what they want without any difficulty or misunderstanding from the bot.

The conversation should flow and always keep the user in control of the conversation. Users should come away from their experience with the chatbot and think that it was a fun, easy to use and straightforward interaction that would encourage them to come back without any hesitation.

II. LITERATURE REVIEW

Chatbots has emerged as a hot topic in the latest years, and it is used by numerous companies in various areas - help desk tools, automatic telephone answering systems, e-commerce and so on. Even though the technology has been around since the 60's (Atwell & Shawar, 2007). Why are we suddenly so interested in this technology now? This can likely be explained by the recent year's advancements in messaging applications and AI technology (Brandtzaeg & Følstad, 2017).

III. PROBLEM STATEMENT

Artificial intelligence chatbot is a technology that makes interactions between man and machines using natural language possible. From literature, we found out that in general, chatbot are functions like a typical search engine. Although chatbot just produced only one output instead of multiple outputs/results, the basic process flow is the same where each time an input is entered, the new search will be done. Nothing related to previous output. This research is focused on enabling chatbot to become a search engine that can process the next search with the relation to the previous search output. In chatbot context, this functionality will enhance the capability of chatbot's input processing.

IV. ARCHITECTURE

Chatbot architecture is the spine of the chatbot. The type of architecture for your chatbot depends on various factors like use-case, domain, chatbot type, etc. However, the basic conversation flow remains the same. Let us learn more about the critical components of chatbot architecture

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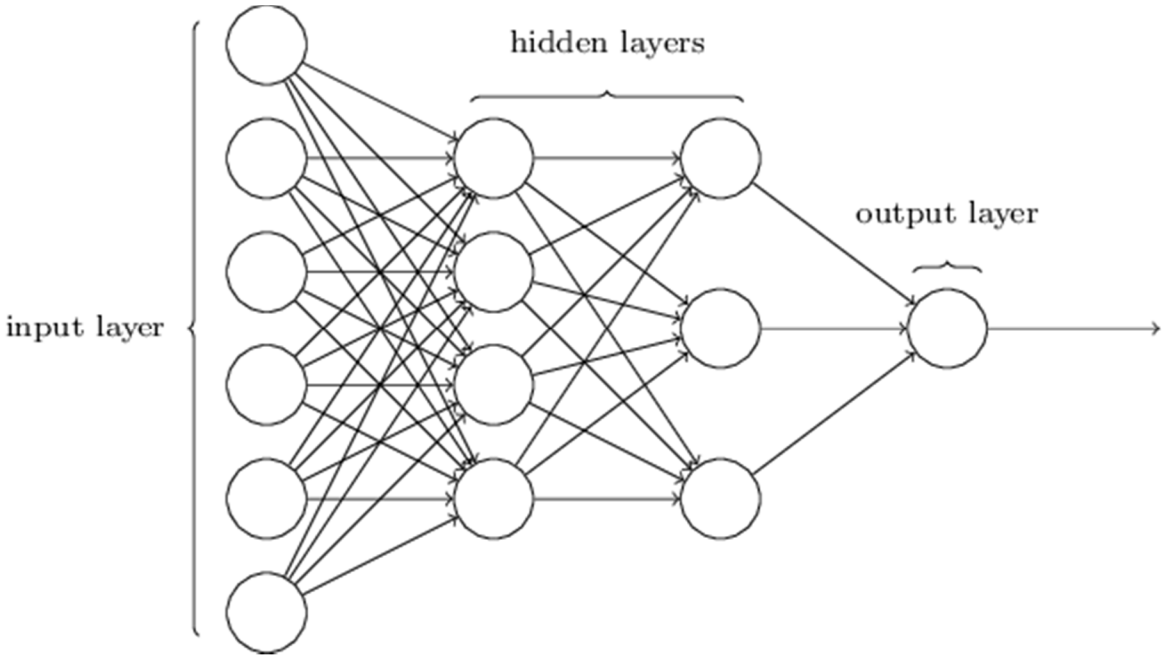
A. Question and Answer System

As the name suggests, the Q&A system is responsible for answering customers' frequently asked questions. The question is interpreted by the Q&A system, which then replies with appropriate responses from the knowledge base. It consists of the following elements:

1) *Manual Training:* Manual training entails the domain specialist compiling a list of commonly asked user questions and mapping out the answers. It enables the chatbot to identify the most relevant questions' answers rapidly.
2) *Automated Training:* Automated training entails sending business document to the chatbot, such as policy documents and other Q&A type documents, and instructing it to train itself. From these documents, the engine generates a list of questions and responses. The chatbot would then be able to respond with confidence.

B. Artificial Neural Networks

Neural Networks are a way of calculating the output from the input using weighted connections, which are computed from repeated iterations while training the data. Each step through the training data amends the weights resulting in the output with accuracy.



As discussed earlier here, each sentence is broken down into individual words, and each word is then used as input for the neural networks. The weighted connections are then calculated by different iterations through the training data thousands of times, each time improving the weights to make it accurate.

The trained data of a neural network is a comparable algorithm with more and less code. When there is a comparably small sample, where the training sentences have 200 different words and 20 classes, that would be a matrix of 200×20. But this matrix size increases by n times more gradually and can cause a massive number of errors. In this kind of scenario, processing speed should be considerably high.

There are multiple variations in neural networks, algorithms as well as patterns matching code. Complexity may also increase in some of the variations. But the fundamental remains the same, and the critical work is that of classification.

C. Working

Nowadays, we see the chat bots everywhere Chat bots are the source of answers to the users questions in any particular domain where it is operating. Chat bots are the source of answers to the users questions in any particular domain where it is operating. The most popular example today is the Amazon's Alexa. Chat bots are at almost every place, one can see it at every second website they visit. A bot is helpful in answering queries related to information which might be unreachable at that website easily. Most of the websites avail users with chat bots to aid them to go through what the websites facilitate. They are turning out to be our virtual assistants in everyday lives.

In proposed the techniques are integrate with deep data mining processes in which the actual answer is to be determine in which the proposed mechanism will helps to accurately work on proper replying system in existing chat the undeterminable questions are not work out properly but in this case we go for the execution of proper development in which we provide the best way of execution to the system. In proposed the unrecognized questions will catch and workout by admin which helps to keep the track of execution.

D. Basics of Chat Bot

A chatbot is an artificially intelligent creature which can converse with humans. This could be text-based, or a spoken conversation (in case of voice-based queries). Chat bots are basically used for information acquisition. It can run on the local PCs and mobile phones, though most of the time it is accessed through the internet. It can be compelling, captivating and spell-bounding. It is a conversational agent which interacts with users in a certain domain or on a particular topic with input in natural language sentences. Mainly a chatbot works by a user asking some question or initiating a new topic of discussion. Chat bots can be referred as software agents that pretend as human entity. These are the agents with AI embedded and using NLP they can answer to user questions. Predefined knowledge base helps develop a response to the query.

V. FUTURE SCOPE

Chatbots are cited as virtual assistants. it is a reasonably computing software which can act as somebody's. The Chatbots is analyzed and improved. it's utilized in various fields like education, business, online chatting etc. it's utilized within the sector of education as a learning tool. the knowledge necessary for education is stored within the information base and will be retrieved any time by querying the bot. In business field, it's accustomed provide business solutions in an efficient way. When the solutions are efficient, the business is improved and thus the expansion of the organization are increased. This Chatbot is used in online chatting for entertainment purpose. People can chat with these bots online after they're bored for the aim of entertainment. Chatbots ends up in smart conversation and is advancing at an unprecedented rate with each new development.

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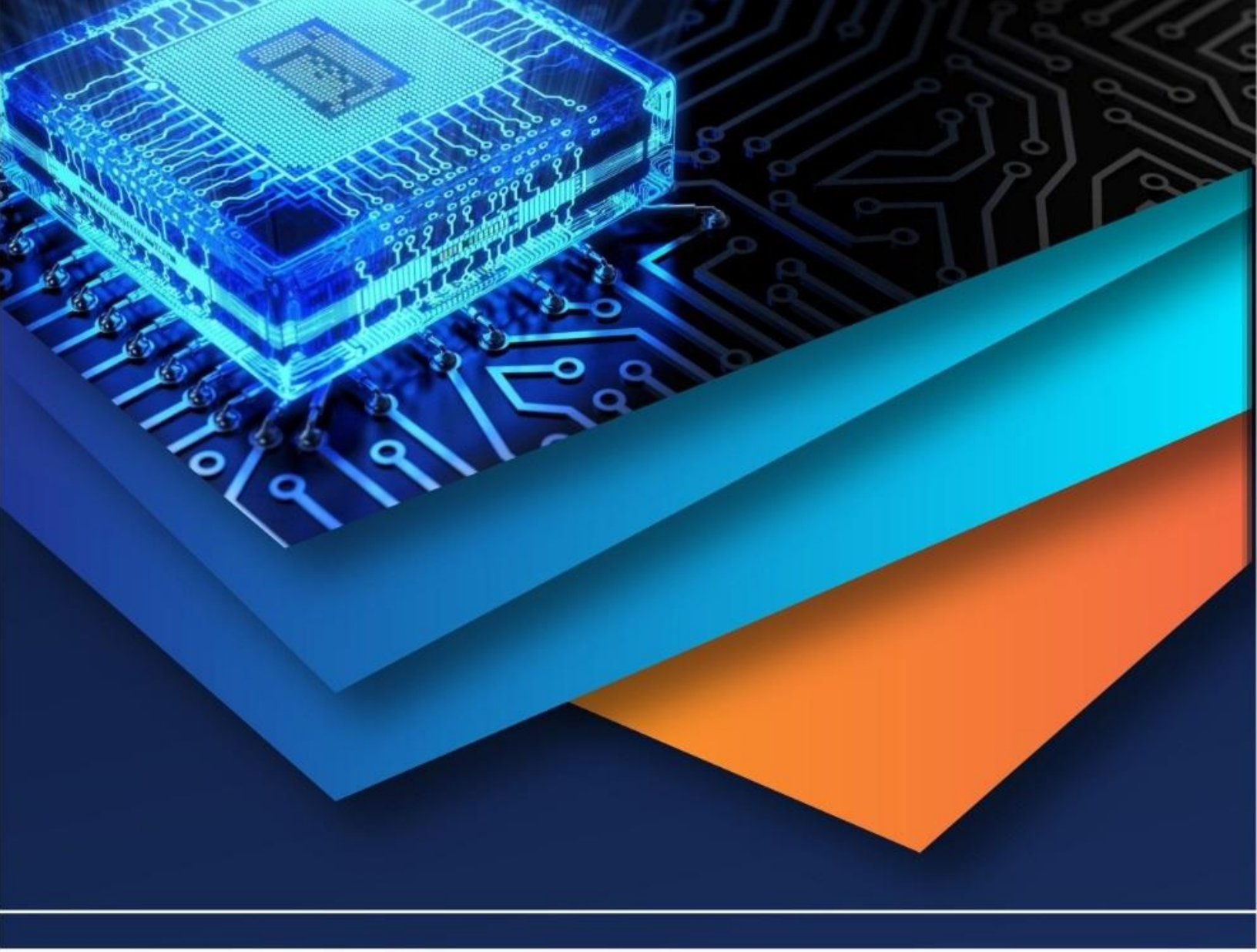

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