A DEEP LEARNING APPROACH TO BUILDING ADVANCED CHATBOT APPLICATIONS

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ABSTRACT

Although the media and business sectors are paying more and more attention to chatbots, little is known about what they are, how to build them, and their potential applications. Through an analysis of current platforms, goods, and technology, as well as the creation of a model chatbot, this study aims to provide answers to these three issues. More individuals will be able to use and build chatbots if they can be defined, their uses clarified, and their creation shown. This will speed up the growth of the chatbot ecosystem. Beginning with the definition of basic concepts, the first part of the work focusses on showcasing platforms, products, and technologies that are available, while the second part walks through the process of creating a model chatbot, covering software architecture and user interaction design.

I. INTRODUCTION

OBJECTIVE OF THE PROJECT

By defining chatbots, demythologising their applications, and demonstrating how to build them, more people will be able to use and create them, which will hasten the growth of the chatbot ecosystem. Technological innovation and the development of new solutions can assist in automating and streamlining more jobs, allowing workers to concentrate on more intriguing problems and complete more tasks. Many current duties might be made simpler and automated by chatbots, which would speed up technological advancement generally.

II. LITERATURE SURVEY

Chatbots: Are They Really Useful?

Author: Bayan Abu Shawar, Eric Atwell

The paper is basically focused on an academic paper highlighting some case studies and including a brief history of chatbots that extends back to the earliest experiments such as ELIZA (c. 1966). The paper is based on making a chatbot using AIML patterns with ALICE.[1] A Web-based Platform for Collection of Human Chatbot Interactions Author: Lue Lin, Luis Fdo. D'Haro, and Rafael Banchs The paper presents a chatbot design which is work on the web-based framework. Lue Line, Luis Fernando D'Haro and Rafael E. Banchs in HAI 2016 proposed the Web Chat which was a crowd-sourced initiative that could collect and annotate human chatbot interactions. [12]

The anatomy of ALICE

Author: Wallace, Richard S. In this paper, Dr. Richard S.

Wallace proposed the technical presentation of Artificial Linguistic Internet Computer Entity (A.L.I.C.E.) as well as Artificial Intelligence Markup Language (A.I.M.L.), which are set in the background by philosophical and historical ruminations occurring on human consciousness. [13]

CHARLIE: An AIML-based Chatterbot as an Interface in INES Author: Mikic, Burguillo, Llamas, Rodr´ıguez, Rodr´ıguez

The paper focuses on the description of this chatbot called CHARLIE (CHAtteR Learning Interface Entity). CHARLIE can communicate with students in natural language and answer general or domain-specific questions. The student can also request questionnaires or free questions from the bot to test their knowledge.[10] An e-business chatbot using AIML and LSA Author: N. Thomas In this paper, Thomas T provided the way by which the chatbot is planned in a manner that for a single template, it gives irregular responses. LSA based inquiries are giving the right reactions to random responses.

Recent developments do allow a more scripted, controlled approach to take a seat atop the overall conversational AI, getting to compile the simplest of both approaches, and usage within the fields of sales and marketing is underway. Its creator believes that it are often incorporated into objects around the home like robots or talking pets, intending both to be useful and entertaining, keeping people company. Mitsuku may be a chatbot created from AIML technology by Steve Worswick. It claims to be an 18-year-old female chatbot from Leeds, England. It contains all of Alice AIML files, with many additions from user-generated conversations, and is usually a piece ongoing . For example, if someone asks "Can you eat a house?" , Mitsuku looks up the properties for "house". Finds the worth of "made from" is about to "brick"and replies "no", as a home is not edible. She can play games and do magic tricks at the users request. In 2015 she conversed, on average, more than a quarter of a million times daily. Current chatbots are developed using a variety of methods like rule-based where rules are hard-coded in code, AI-based bots, pattern-based which can handle only mentioned patterns for retrieving answers. There are frameworks available for developing chatbots but they also use either rule-based or pattern-based techniques. In rule-based chatbots that are easiest to build, one needs to write rules like If X then Y else if A then B, etc. So if there are 100 scenarios, the developer needs to write 100 rules for each of the scenarios. The volume, variety, and complexity of data make such techniques inefficient. It is nearly impossible to write rules and/or patterns for massively available data. AI-based bots are built on NLP and ML. They are based on the human capability of learning information but with more efficiency. Natural Language Processing (NLP) are often used where predefined or static rules, patterns might not work. On comparing to all of these chatbots a special chatbot system is to be proposed for each enterprise like banking-related chatbots, educational related chatbots, medical-related chatbots, etc.., which works on that enterprise more effectively with good efficiency within a short time. For this kind of chatbots, we have to incorporate the Natural Language Processing (NLP) which is used to resolve language-related error queries and acts according to it and removes the sentimental barriers and makes the conversation effectively in a good way.

III.   SYSTEM ANALYSIS AND DESIGN

EXISTING SYSTEM

Before exploring new technology one should examine prior work and learn from past ideas, both succeed and also failed attempts. This section presents a selection of events from the last century, which introduced the ideas that formed the present definition of a chatbot. It is not an attempt to give an all-encompassing overview about the history of computing, instead the aim is to explain where the concept of chatbots and the interest of creating them originated from.

PROPOSED SYSTEM

This is an automated chat robot design to answer users frequently asked questions, earlier natural language processing techniques were using to design this robots but its accuracy of giving correct answer was less and now due to Deep Learning algorithms accuracy of giving correct answer increase, so here using python deep learning project we are building CHATBOT application to answer users questions.

To implement this technique first we train deep learning models with the train data (all possible question's answers) and whenever users give any question then application will apply this test question on train model to predict exact answer for given question.

Earlier companies were hiring humans to answer user's queries but by using this application we can answer user's question without using any man power.

Chabot can be described as software that can chat with people using artificial intelligence. Chabot 's are generally used to respond quickly to users. Chabot's, a common name for automated conversational interfaces, present a new way for individuals to interact with computer systems. Traditionally, to get a question answered by a software programinvolves using a search engine, or filling out a form. A Chabot allows a user to simply ask questions inthe same manner that they would address a human. There are many well-known voice-based catboatscurrently available in the market: Google Assistant, Alexa and Siri. Chabot's are currently being adoptedat a high rate on computer chat platforms.

To implement this project we are using python deep learning neural networks and NLTK (natural Language Processing API) to process train and test text data.

IV.   SYSTEM DESIGN

SYSTEM ARCHITECTURE
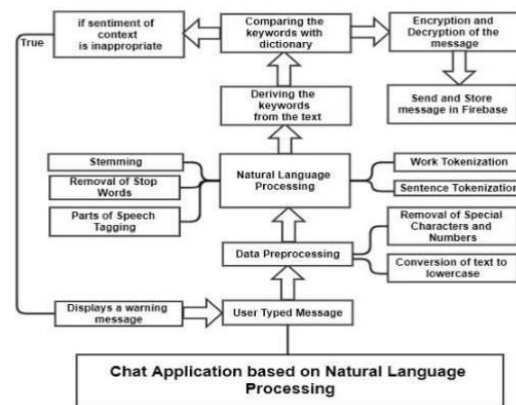
V.   SYSTEM IMPLEMENTATION

Modules

This application consists of 4 modules

New user Registration: Using this module users can signup with the application.

Login: Using this module user can login to application

Chabot: Using this module users can interact with Chabot

Logout: Using this module users can exit from the application

NATURAL LANGUAGE PROCESSING:

The Natural Language Toolkit, or more commonly NLTK, is a suite of libraries and programs for symbolic and statistical natural language processing (NLP) for English written in the Python programming language. It was developed by Steven Bird and Edward Loper in the Department of Computer and Information Science at the University of Pennsylvania.[4] NLTK includes graphical demonstrations and sample data. It is accompanied by a book that explains the underlying concepts behind the language processing tasks supported by the toolkit,[5] plus a cookbook.[6]

NLTK is intended to support research and teaching in NLP or closely related areas, including empirical linguistics, cognitive science, artificial intelligence, information retrieval, and machine learning.[7] NLTK has been used successfully as a teaching tool, as an individual study tool, and as a platform for prototyping and building research systems. There are 32 universities in the US and 25 countries using NLTK in their courses. NLTK supports classification, tokenization, stemming, tagging, parsing, and semantic reasoning functionalities

NLTK stands for natural language Toolkit. This toolkit is one of the foremost powerful NLP libraries which contains packages to make machines understand human language and reply thereto with an appropriate response. Tasks performed by NLTK are: Automatic text summarization, Translation, Named entity recognition, relationship extraction, and sentiment analysis. natural language processing concepts applied to the pre processed data. natural language Processing could also be a way for Machines to guage , determine, and acquire the semantics of human language wisely. Python programming language is used to accomplish several tasks of natural language Processing on cleaned data. Word Tokenization, Sentence Tokenization, Removal of Stop words, Stemming, Entity Recognition, Parts of Speech Tagging, etc. are practiced to reconstruct the data to a pattern suitable for interpretation. Word Tokenization is that the tactic of adjusting the text into tokens and saving it within the list. Sentence tokenization is that the tactic of transforming the text into different phrases. Stop words deemed inapplicable or pointless because they need limited importance in capturing the semantics of the text and additionally stop words increase the searching time which finishes up in wastage of the many computational resources. Stop words are omitted to preserve both time complexity and space complexity. Stemming could also be a crude method that cuts off the ends or beginning of words. the first aspiration of stemming is to vary a derivative word into its standard form and keeps the idea word. Parts of Speech Tagging examines the text and assigns parts of speech to each token as a verb, adjective, noun, etc., Entity Identification helps to classify the named entities like persons, organizations, etc., from the text. After implementing NLP techniques on the pre-processed cleaned data, definitive keywords derived. These keywords compared with the keywords available within the user dictionary. The vocabulary contains all the keywords. From the keywords procured

from the text, the sentiment of the context determined. If the meaning of the message is in appropriate, then user not allowed to send the message.
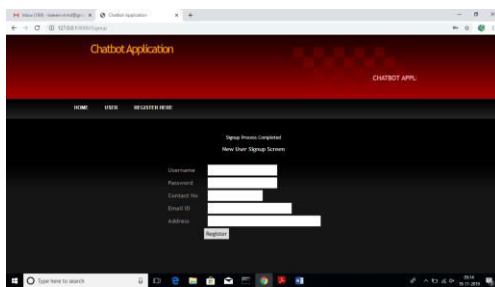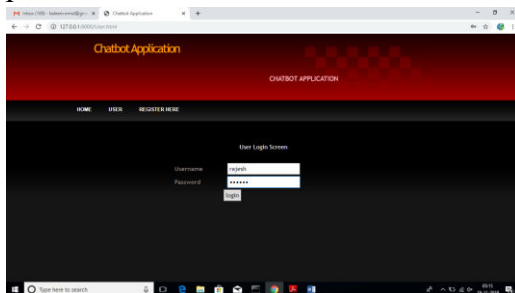
VI. SCREEN SHOTS
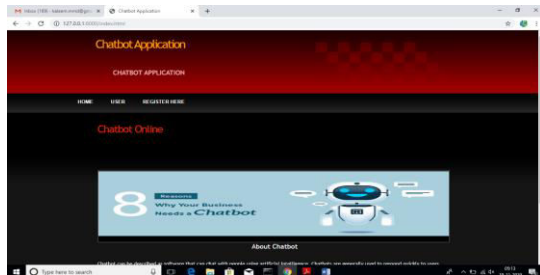
In above screen click on 'Register Here' link to add sign up with application
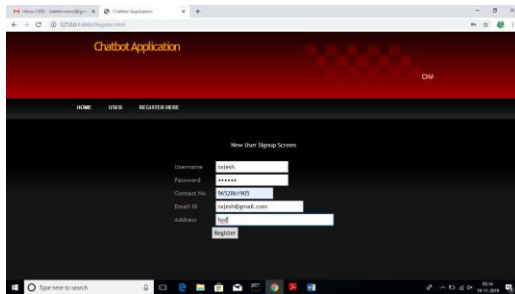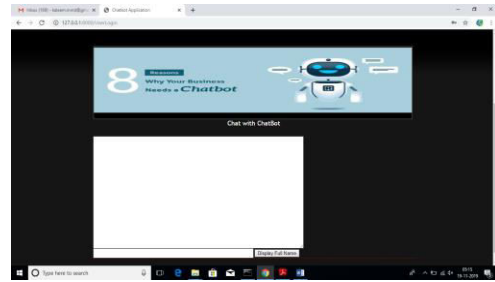

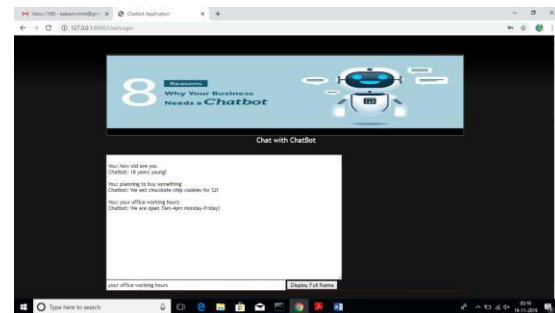After signup will get below confirmation screen

Now click on 'User' link to login to application

After login will get below user chat bot screen

In above screen user can enter questions and chat bot replies to that questions. See below screen

In above screen we can see I asked 3 questions and chat bot answer them correctly. Similarly we can ask any question and chat bot can answers those questions as long as those question answers are available inside training model of deep learning object.

VII. CONCLUSION

The basics of chatbots were presented in this study. It provided a summary of both current and historical concepts, goods, and platforms. Chatbots' present popularity, possible applications, and drawbacks have all been thoroughly examined. Through the development of an example chatbot that featured interaction and user experience design as well as a generic, reusable software architecture for chatbots, several facets of implementing a chatbot and dealing with conversational interfaces have been demonstrated. The purpose of this work was to provide an overview of chatbots, their use cases, and how to develop them, however

not all topics could be covered. This information should aid in investigating other chatbot usage options and allow more developers to use chatbots in novel contexts, which will enhance human-machine interaction generally.

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