A SURVEY To Chatbot System With Knowledge Base Database By Using Artificial Intelligence & Expert Systems

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Abstract -Chatbot survey are check the current world wide status with the latest related work. With the advances in Artificial Intelligence, machines have started to impersonate different human traits today. Artificial intelligence conversational entities, also called chatbots, are an excellent example of such machines. Chatbots are currently gaining a lot of popularity especially in business sector as they have the potential to automate customer service and reduce human efforts. For a chatbot to perfectly emulate a human dialogue, it must analyze the input given by a user correctly and formulate a relevant and appropriate response.

Chatbots are one class of intelligent, conversational software agents activated by natural language input (which can be in the form of text).Today is the age of intelligence in machines. With the advances in Artificial Intelligence, machines have started to impersonate different human traits today. Artificial intelligence conversational entities, also called chatbots, are an excellent example of such machines. Chatbots are computer programs capable to carry out near - natural conversation with people. In this work, we describe the evolution of chatbots from a rudimentary model to an advanced intelligent system. Chatbots are currently gaining a lot of popularity especially in business sector as they have the potential to automate customer service and reduce human efforts. For a chatbot to perfectly emulate a human dialogue, it must analyze the input given by a user correctly and formulate a relevant and appropriate response.

Artificial Intelligence in machines is a very challenging discussion. It involves the creation of machines which can simulate intelligence. This paper discusses some of the current trends and practices in AI and subsequently offers alternative theory for improvement in some of today's prominent and widely accepted postulates. For this, focus on the structuring and functioning of a simple A.I. system - chatbots (or chatter bots) is made. The paper shows how current approach towards A.I. is not adequate and offers a new theory that discusses machine intelligence, throwing light to the future of intelligent systems.

The realization of a prototype of a conversational workflow for a Chatbot in tires domain. The initial purpose has focused on the design of the specific model to manage communication and propose the most suitable tires for users. For this aim, it has been used the Petri Net. Finally, after the implementation of the designed model, experimental campaign was conducted in order to demonstrate its enforceability and efficiency. In research fields, the issue of Chatbot and Bot in general has been discussed for many years, although it has seen an increasingly gradual slowdown in recent years. In fact, the amount of investment by companies in trying to create a Bot as similar to an operator is growing[1][2].

Key Words: Chatbot, Artificial intelligence, Software

1. INTRODUCTION

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. A chatbot is a program designed to counterfeit a smart communication on a text . The chatbots have embedded knowledge which helps them to identify the user's query and give a response to it.

1.1.0   Background

Speech is one of the most powerful forms of communication between humans; hence, it is the researchers" ambition in the human computer interaction research field to improve speech interaction between the human and the computer in order to simulate human-human speech interaction. Speech interaction with modern networked computing devices has received increasing interest in the past few years with contributions from Google, Android and IOS. Because they are more natural than graphic-based interfaces, spoken dialogue systems are beginning to form the primary interaction method with a machine [1]. Therefore, speech interaction will play a significant role in humanising machines in the near future [2]. Much research work has focussed on improving recognition rates of the human voice and the technology is now approaching viability for speech based human computer interaction. Speech Interaction splits into more than one area including: speech recognition, speech parsing, NLP (Natural Language Processing), keyword identification, Chabot

design/personality, artificial intelligence etc. Chatbot is a computer program that have the ability to hold a conversation with human using Natural Language Speech. In this paper, a survey of Chatbot design techniques in speech conversation between the human and the computer is presented. Nine studies that made identifiable contributions in Chatbot design in the last ten years are selected and then, reviewed. The different techniques used for Chatbots in the selected works are compared with those used in Loebner-Prize Chatbots. The findings are discussed and conclusions are drawn at the end.

1.2.0   Overview

A.   Human-Computer Speech interaction Speech recognition is one of the most natural and sought after techniques in computer and networked device interaction has only recently become possible (last two decades) with the advent of fast computing. Speech is a sophisticated signal and happens at different levels: "semantic, linguistic, articulatory, and acoustic" [3]. Speech is considered as the most natural among the aspects of human communication, owing to copious information implicitly existing beyond the meaning of the spoken words. One of the speech information extraction stages is converting speech to text via Automatic Speech Recognition (ASR) and mining speech information [4]; then, the resulting text can be treated to extract the meaning of the words. Speech recognition is widely accepted as the future of interaction with computers and mobile applications; there is no need to use traditional input devices such as the mouse, keyboard or touch sensitive screen and is especially useful for users who do not have the ability to use these traditional devices [5]. It can help disabled people with paralysis, for example, to interact with modern devices easily by voice only without moving their hands. B. Natural Language Toolkit (NLTK) In order to deal with and manipulate the text resulting from speech recognition and speech to text conversion, specific toolkits are needed to organise the text into sentences then split them into words, to facilitate semantic and meaning extraction. One of these toolkits is the widely used NLTK which is a free plugin for Python. The Natural Language ToolKit (NLTK) is a set of modules, tutorials and exercises which are open source and cover Natural Language Processing symbolically and statistically. Different grammar rules are used to categorise the tagged words in the text into groups or phrases relating to their neighbours and positions. This type of grouping is called chunking into phrases, such as noun phrases and verb phrases. C. Chatbot strategies To give suitable answers to keywords or phrases extracted from speech and to keep conversation continuous, there is a need to build a dialogue system (programme) called a Chatbot (Chatter-Bot). Chatbots can assist in human computer interaction and they have the ability to examine and influence the behaviour of the user [8] by asking questions and responding to the user's questions. The Chatbot is a

computer programme that mimics intelligent conversation. The input to this programme is natural language text, and the application should give an answer that is the best intelligent response to the input sentence. This process is repeated as the conversation continues [9] and the response is either text or speech. Building a Chatbot needs highly professional programming skills and experienced developers to achieve even a basic level of realism. There is a complicated development platform behind any Chatbot which will only be as good as its knowledge base which maps a user"s words into the most appropriate response. The bot developer usually builds the knowledge base as well. However, there are some platforms which provide a learning environment. Writing a perfect Chatbot is very difficult because it needs a very large database and must give reasonable answers to all interactions. There are a number of approaches to create a knowledge base for a Chatbot and include writing by hand and learning from a corpus. Learning here means saving new phrases and then using them later to give appropriate answers for similar phrases [10]. Designing a Chatbot software package requires the identification of the constituent parts. A Chatbot can be divided into three parts: Responder, Classifier and Graphmaster (as shown in Figure. 1) [11], which are described as follows: 1) Responder: it is the part that plays the interfacing role between the bot's main routines and the user. The tasks of the responder are: transferring the data from the user to the Classifier and controlling the input and output. Classifier: it is the part between the Responder and the Graphmaster. This layer's functions are: filtering and normalising the input, segmenting the input entered by the user into logical components, transferring the normalised sentence into the Graphmaster, processing the output from the Graphmaster, and handling the instructions of the database syntax 3) Graphmaster: is the part for pattern matching that does the following tasks: organising the brain's contents, storage and holding the pattern matching algorithms. Fig. 1.
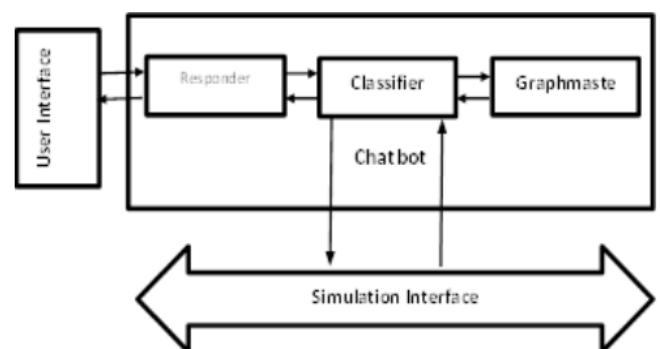

Figure. 1.2 Components of Chatbot [11]

Components of Chatbot [11] D. Chatbot Fundamental Design Techniques and approaches To design any Chatbot, the designer must be familiar with a number of techniques: 1) Parsing: this technique includes analysing

the input text and manipulating it by using a number of NLP functions; for example, trees in Python NLTK. 2) Pattern matching: it is the technique that is used in most Chatbots and it is quite common in question-answer systems depending on matching types, such as natural language enquiries, simple statements, or semantic meaning of enquiries [12]. 3) SQL and relational database: is a technique used recently in Chatbot design in order to make the Chatbot remember previous conversations. 6) Markov Chain: is used in Chatbots to build responses that are more applicable probabilistically and, consequently, are more correct. The idea of Markov Chains is that there is a fixed probability of occurrences for each letter or word in the same textual data set [13]. 7) Language tricks: these are sentences, phrases, or even paragraphs available in Chatbots in order to add variety to the knowledge base and make it more convincing. The types of language tricks are: Canned responses.• Typing errors and simulating key strokes.• Model of personal history.• Non Sequitur (not a logical conclusion)• Each of these language tricks is used to satisfy a specific purpose and to provide alternative answers to questions [13]. Use Case Diagram of Chatbot Design. The following facts are kept in mind during designing a Chatbot Creating a Chatbot for creating a Chatbot, a program has to be written. .NET programming language is used for programming. The Chatbot is created in such a way to help the user, improve the communication and amuse the user. D. Creating a Chat The chat is created using a pattern that is known to the user and could be easy to understand. Chat dialog box show up to create conversation. This dialog box is created using .NET applets. E. Pattern Matching It is a technique of artificial intelligence used in the design of a Chatbot. The input is matched with the inputs saved in the database and corresponding response is returned. F. Simple The design of a Chatbot is very simple. It just answers to the questions asked by the user, if the question is found in the database. G. Conversational and Entertaining The Chatbot responses are a way known to the user. The conversation follows a Basic English language and interacts in an easy to read manner. The conversation between the user and the Bot is entertaining.

2. LITERATURE SURVEY

ELIZA is also considered to be one of the first programs capable of passing the Turing test [1]. At first ELIZA examined the text inputted by the user and checked for certain keywords. Then it applied values to them, and transformed the input into a response. The script that ELIZA ran determined the keywords, set the values of keywords, and set the rules of transformation for the output. PARRY was written in 1972 by psychiatrist Kenneth Colby, at Stanford University. PARRY attempted to simulate a person with paranoid schizophrenia. It embodied a conversational strategy, and as such was a much more serious and advanced program than ELIZA. It was described as "ELIZA with attitude". PARRY was tested in the early 1970s using a variation of the Turing Test. A group of experienced psychiatrists analysed a combination of real patients and computers running PARRY through teleprinters. The psychiatrists were able to make the correct identification only 48 percent of the time. Jabberwacky is one of the earliest attempt at designing an AI through human interaction [2]. It was mainly a form of entertainment. It aimed to move from a text based system to wholly voice operated system. ALICE (Artificial Linguistic Internet Computer Entity) created by Richard Wallace in 1995, is an open source natural language processing chatbot program that converses with a human by evaluating user input using certain heuristical pattern matching rules. ALICE is based in XML knowledge bases. It matches the user input against predefined set of responses. As it has a predefined set off responses, it cannot answer all the queries adequately. It is possible for ALICEbots to expand their knowledge bases through an XML dialect AIML [13]. Using this, An ALICE bot can be designed to be an expert in any domain specific information. Watson, built by IBM is a question answering (QA) computing system designed to apply advanced natural language processing, information retrieval, knowledge representation, automated reasoning, and machine learning technologies to the field of open domain question answering. Watson uses IBM's DeepQA software and the Apache UIMA (Unstructured Information Management Architecture) framework. It runs on the SUSE Linux Enterprise Server 11 operating system using Apache Hadoop framework to provide distributed computing [3] [4]. It participated in the Jeopardy! Competition and won in 2011 [5]. Siri uses ASR (Automatic speech recognition) to translate human speech (which includes short utterances of commands, dictations or questions) into text. Using natural language processing (part of speech tagging, noun-phrase chunking, dependency and constituent parsing) it translates transcribed text into "parsed text". Using question & intent analysis it analyzes parsed text, and detects user commands and actions. ("Schedule a meeting", "Set my alarm"). Third party web services like OpenTable, WolframAlpha are interfaced using data mashup technologies. They perform actions like search operations, and question answering. Speech that SIRI has identified as a question, but it cannot directly answer, is forwarded to more general question-answering services such as WolframAlpha. Alexa is a voice service inhabiting the Amazon Echo device. Alexa uses natural language processing algorithms for voice interaction. She uses these algorithms to receive, recognize and respond to voice commands. She is capable of music playback, making to-do lists, setting alarms, streaming podcasts, playing audiobooks, and providing weather, traffic, and other real time information. Alexa can also control several smart devices using itself as a home automation hub. Mitsuku uses a programming language called AIML to understand and respond to people.

3. CONCLUSION

The proposed system will be used to identify answers related to user submitted questions. The need is to develop a database where all the related data will be stored and to develop a web interface. A database will be developed, which will store information about questions, answers, keywords, logs and feedback messages. A usable system will be designed, developed and deployed. We proposed new methodology which focus on both hardware and software activity which result in higher accuracy as compared to previous intrusion detection methodology. It is a convenient way of extracting patterns and focuses on issues relating to their feasibility, utility, efficiency and scalability. The Development of this chatbot is done using Microsoft bot framework, which is using Microsoft cognitive service . The user can ask the query in any format and get appropriate response on basis of pattern matching algorithm.

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