International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 04 | Apr 2022 www.irjet.net p-ISSN: 2395-0072

Artificial Intelligence (AI) for Transportation System

Bhor Shubham[1], Nikas Tushar[2], Shelke Aditya[3], Bangar Abhishek[4]

[1, 2, 3] *Student, Dept. of Computer Engineering, Jaihind College of Engineering, Maharashtra, India*
[4] *Professor, Dept. of Computer Engineering, Jaihind college of Engineering, Maharashtra, India*

Abstract - *Public transport is employed by many of us everywhere the world to travel to new places. Beings are normally make a map to journey new places and for special events they may have a sense of totally lost in new place. At this point our talking man-like machine acts the helper for journeying persons. Our talking man-like machine helps the people to get their desire place to begin and place where one goes. it's an application that's work on the web, tabletop and also on telegram application. This talking man-like machine uses the tongue Processing (NLP) and Deep Learning ways of doing. It acts because the be living to try and do with man being as a graphical user Interface(GUI). This AI talking man-like machine request user for current placing and place where one goes placing by making letter of invitation some questions. It gets at the small print of the user's questions and obtain along with facts group of the talking man-like machine. The deep learning techniques are utilized in this talking man-like machine are liable for getting through knowledge the user's questions through being without error to stay far from any getting wrongly. Once the users question has been get through knowledge of, then the talking man-like machine provides the rightest declare the users question request. Then the users get all the news given associated with the bus names with their numbers that the person can journey to the required placing. Our talking man-like machine instrumented by using Python keras library and Tkinter is employed for GUI (Graphical User Interface) purpose.*

Key Words: Chatbot, Artificial Intelligence, Natural Language Processing, Deep Learning, Keras, GUI, Tkinter.

1. INTRODUCTION

People frequently journey to different states, greatly respected places and sometimes they will have a sense of totally lost during a new place. they are doing not have knowledge of the way and buses number to urge stretched to their desired place where one goes. many folks face poor usability in making letter of invitation the people around them to urge news given about their place where one goes place. frequently we get to at the stop, able to lock our bus but we don't have any idea about which bus to require to induce stretched to our place where one goes. this can be the most place; position we experience in our daily living while using transport to induce stretched to the specified placing. You move to unknown place and you are doing not have any idea about which bus to require. there 'll be no facts given about the buses or about the bus numbers or the transport that takes you to the place where one goes place. this is often the order of events happens with us over and over. after you get stretched to the stop you'll many groups of persons looking forward to the bus. a number of them have knowledge of the certain, error less bus timing and which bus to be taken to induce stretched to the specified place where one goes and a few of them face the difficulty on which bus to be taken. At this condition, you're totally conditions made things hard. Here we've got knowledge of that the majority of the people support conveyance to urge stretched to their place where one goes. therein condition, most of the people don't have any idea about bus timings, sends, bus numbers and other put tightly into, made filled with. People faces trouble after they visit the new places for the primary time and don't have knowledge of which bus is correct for his or her place where one goes. They wasted the time for waiting the bus and getting together news given about bus from some low level of development persons generally. So there's one answer to over-come this tough question is that our effecting on each other talking man-like machine which supplies complete news given associated with the bus timing and way. This talking man-like machine gets answer to, solution of all the issues associated with the transport and it'll act between, along with users at anywhere or any time. one main thing is that talking man-like machine are very ready to help for users in day to day living. This talking man-like machine will saves the time of user and there's no have to request some-one about bus information.

2. MOTIVATION

Individuals deal with an issue when they are new to the spot and don't realize which transport to take. All things considered, much time is squandered for hanging tight or for get-together the data about the transport what they need to get in to arrive at their objective. There is one arrangement possible for this issue is that an intelligent Chatbot that gives the whole information of the transports and their timings which makes it simpler for individuals to utilize or to impart at any spot or any time. One central concern is that chatbots are fundamental for user's everyday life. The motivation is to develop an AI chatbot for the transportation system that can help travelers to reach their destination easily. It will be available 24x7 and prevent travel scams. User can easily find the best routes, bus numbers, their arrival time based on their current location and destination using this chatbot. We have used Python libraries to implement this chatbot. We have used Tkinter for developing the user interface. Keras

from the Tensorflow library is used to train the model using intent.js on file which contains patterns of questions that users may ask and different responses for that questions. We have added one more feature of voice assistant. Using this feature, users can ask queries by typing or by using voice commands. If the user asks a query using a voice command, then the chatbot also gives a voice response along with the data displayed on the screen. If the user asks a query using typing text, then the chatbot displays the response on the screen. For this, we have used a speech recognition library to implement this feature. Using this feature, the user gives a voice command. speech recognition library converts speech to text. This input text is sent to the trained model to get an appropriate answer. When text response is received, it is converted to speech using the GTTS library. For improving the interaction between users and chatbots, we have trained a model using Keras from the TensorFlow library. We have created a JSON file of various patterns and their responses. Patterns are different possible locations and responses are buses for these locations. We have given a unique tag to each pattern using which we can recognize that pattern. Pattern contains the same question in different formats that the user may ask. The response contains different answers that the chatbot should give to any question. Firstly, we performed tokenization and lemmatization on this JSON file. After that, we trained a sequential model using this formatted data. When the user asks a question, the query is gone through the tokenization and lemmatization process. We then passed this cleaned query to a trained model to predict the response to that query.

3. OBJECTIVE

- Easily find the best routes, bus numbers, their arrival time based on current location and destination of the user.
- Help people to reach their destination safely without facing any problems.
- Provide all bus information at the user's fingertip.
- Users can ask for help without any hesitation.
- Saves users time.
- Provide a better user experience.
- Available 24x7.
- Easy to Use
- Better GUI Interface
- Cost is less expensive
- Voice Interface
- Database Technology used
- Help people to avoid travel scams.
- Use NLP to understand regular language.
- Implement a Telegram chatbot for mobile users so that they can easily get required bus information.
- Implement Tkinter GUI for desktop users.
- Implement a chatbot that can accept voice commands and give corresponding voice response.

4. PROBLEM STATEMENT

Public transportation is a very common way of traveling in big cities. People travel to different places and sometimes may feel completely lost at these places. They may not know the route and buses to reach their destination. So, develop an AI Chatbot that will help them to find the best routes and buses to reach their destination. The chatbot should ask questions to know about the user's current location and destination. Use this information to analyze available data and provide appropriate bus numbers with their arrival time and routes. Develop different GUIs for desktop and mobile users. The user must be able to type a query or give a voice command. According to the user's query, the chatbot should give an appropriate text response or voice response.

5. METHODOLOGY.

5.1 To perform literature survey

To profit a getting through knowledge of currently in existence work we get the idea needed news given from books, daily record units and from google. persons doing teaching also helps a mass in our work and we also have relation the earlier put into print papers to get together news given.

5.2 Apply waterfall model

The waterfall scaled-copy is an in time-order design process, used in software development processes, in which forward development is seen as moving liquid fixedly, unchangingly down (like a waterfall) through the forms of idea, start, observations, design, building, testing, production/Implementation and support.

5.3 Design of AI man-like machine

Designing a talking man-like machine is a mix of both art and science. The art is to get through knowledge of your target clients and their things necessary and the science is to change those bits of knowledge into little steps over to move a frictionless person coming for getting goods or work done experience.

5.4 Implementation of man-like machine

By using NLP i.e.; Natural Language Processing to breakdown and to interpret human language. And using Keras which is used to provide the python interface to the artificial neural networks. It is an open source library.

5.5 Verify and test the test cases

Testing of project problem statement using generated test data (using mathematical models, GUI, Function testing principles, if any) selection and appropriate use of testing tools, testing of UML diagram's reliability.

5.6 Provide AI man-like machine to use

This is the last step where we deliver chatbot to the end user. And take feedback from them, and provide support to them

6. MATHEMATICAL MODEL

Let P1 = Given success cases viz., user's voice query correctly detected, the correct response is provide for given query, Telegram chatbot gives correct responses to user's query For a Problem P1 to be NP-Hard, Satisfiability problem (SAT) must be reducible to P1; i.e. SAT ∝P1

Let for CNF-SAT, CNF = $(X1 \vee \bar{X}2 \vee X3) \wedge (\bar{X}1 \vee X2 \vee \bar{X}3)$

X1: True (i.e.1) if user's voice query correctly detected

X2: True (i.e.1) if the correct response is providing for given query

X3: True (i.e.1) if Telegram chatbot gives correct responses to user's query

Here, there are 8 possibilities for which CNF will be satisfied.

X1	X2	X3
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0
1	0	1
1	1	0
1	1	1

Table -1: CNF Table

This means, we have 8 possibilities for 3 variables. We can check whether CNF is true or not for these 8 possibilities. i.e. For n variables, we have 2n possibilities. This tells us that our problem P1 is taking exponential time. This is similar to satisfiability problem as it is also an exponential time taking algorithm. As satisfiability problem is reducible to our problem P1, problem P1 is NP-Hard. We will devise non-deterministic algorithm for problem P1:

Algosat()

{
for i= 1 to 8

{

Xi=Choice (true, false) ———– Non- deterministic statement

if (CNF == true)

Success () ———– Non- deterministic statement

else
Failure () ———– Non- deterministic statement

}

}

This algorithm will take O(1) time i.e. polynomial time if we know the correct values for Xi. So, this is a non-deterministic algorithm that takes polynomial time O(1). We have proved that P1 is NP- Hard. Also, we have written non-deterministic polynomial time taking algorithm for P1. So, our problem P1 is NP-Complete.

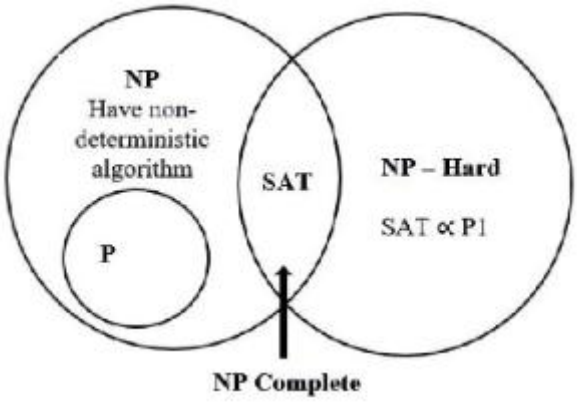

Fig -1: P, NP, NP-Hard, NP-Complete Classes

Fig -2: Telegram Chatbot

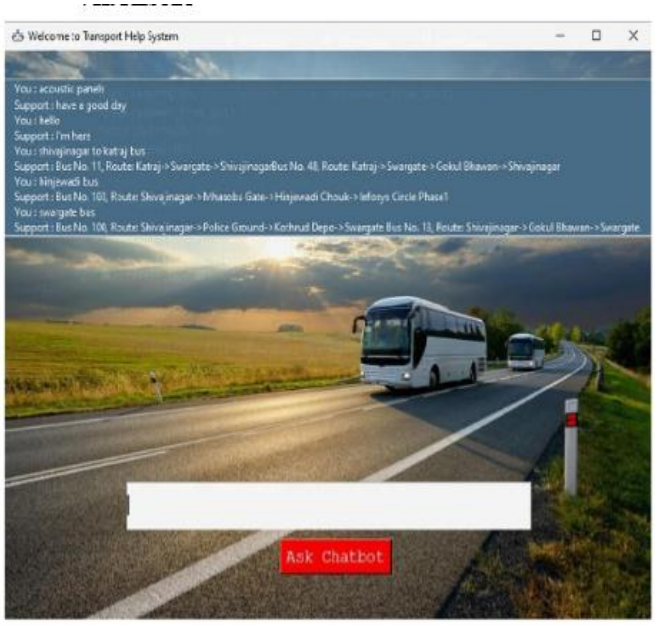

Fig -3: Desktop Chatbot

CONCLUSION

In this project, we used Keras to train model so that chatbot will respond to user's query. Chatbot gives correct results if we provide destination location and current location of user. Chatbot correctly provides the bus numbers, their arrival time and routes as per user's queries. AI (Artificial Intelligence) man-like machine helps people to easily find bus numbers, their arrival time and best routes. This saves time of user and prevents travel scam.

REFERENCES

[1] Feng Liao, Liyuan Shang, Wendong Wan, "Design and Implementation of Public Transportation Enquiry System Based on J2EE" in Atlantic Press, 2018.

[2] Venkataramanan.S, Suriya.D, Mr. K.R.MohanRaj," Voice Based Transport Enquiry System" in Int. Jnl. Of Advanced Networking & Applications (IJANA), 2018.

[3] Shabina Sayed, Rushabh Jain, Burhanuddin Lokhandwala, Fakhruddin Barodawala and Murtuza Rajkotwala, "Android based Chat-Bot", International Journal of Computer Applications, Volume 137, Number 10, pp. 28-32, March 2016.

[4] Fernando A. Mikic Fonte, Martin Llamas Nistal, Juan C. Burguillo Rial, and Manuel Caeiro Rodr´ıguez, "NLAST: A natural language assistant for students", IEEE Global Engineering Education Conference (EDUCON, pp. 709-713), April 2016.

[5] Tracy A. Tindall Michael G. Makar, "Dynamic chatbot". [6]. B. R. Ranoliya, N. Raghuwanshi and S. Singh, "Chatbot for University Related FAQs", 2017 International Conference on Advances in Computing, Communications and Informatics (ICACCI), Udupi, 2017.

[6] Jabberwacky" IEEE 802.3 12.4.3.2.3 Jabber function, 2018.

[7] A Comparative Study Of Chatbot Implementation Techniques, ISSN 2278-0882 Volume 7, Issue 10, International Journal Of Scientific Research Engineering And Technology (IJSRET), 2018.

[8] Tarun Lalwani, Shashank Bhalotia, Ashish Pal, Shreya Bisen, Vasundhara Rathod, "Implementation of a Chatbot System using AI and NLP", International Journal of Innovative Research in Computer Science & Technology (IJIRCST), Volume 6, Number 3, pp. 26-30, May 2018.

[9] Imran Ahmed and Shikha Singh, "AIML Based Voice Enabled Artificial Intelligent Chatterbot", International Journal of u- and eService, Science and Technology (IJUNESST), Volume 8, Number 2, pp. 375 384, March 2015.

[10] Anirudh Khanna, Bishwajeet Pandey, Kushagra Vashishta, Kartik Kalia, Bhale Pradeepkumar and Teerath Das, "A Study of Today's A.I. through Chatbots and Rediscovery of Machine Intelligence", International Journal of u- and e- Service, Science and Technology 2015.

[11] V.Manoj Kumar, A.Keerthana, M.Madhumitha, S.Valliammai, V.Vinithasri, "Sanative Chatbot For Health Seekers", International Journal Of Engineering And Computer Science 2016.