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Chatbot Application for Tourism Using Deep Learning

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Abstract—**Chatbot is broadly known now a days which is intended to expand the communication and connection with human users. Generally, it works by question from the user and response by a software program. The user can enter the question by means of text. When the user enters the query, the bot uses TensorFlow's tokenizer to assign a unique token to each distinct word and send it to RNN layer. This chatbot will essentially respond to the queries and relevant information on all the tourist places and facilities in Andaman and Nicobar island.**
Keywords—, Chatbot, Artificial Intelligence, Deep learning, Neural network, Tourism

I. INTRODUCTION

The chatbot is utilized to lead the conversation between user and computer to access information through messaging. The conversation should be possible by means of text or voice. Every platform has its own criteria to fulfil and its features to achieve in a chatbot to effectively connect with the user. The bots can be enhanced by new data and make communications look more practical. There are many types of chatbots used in the market with different algorithms. With the help of deep learning techniques which uses of machine learning algorithm and artificial intelligence chatbots can learn from data and human conversations. These chatbots are designed to convincingly replicate the kind of interactions a user might have with a real person. Chatbot can replace the role of travel agent and respond to customer queries.

II. LITERATURE SURVEY

There are various types of Chatbot. Some of the popularly known types of creating a chatbot are as follows:

A. AI Chatbots

Artificial intelligence chatbots understand language beyond pre-programmed commands. They are trained by loading large amount of existing data of the clients, applying algorithms, and utilizing the outcomes to deliver a response. The more the AI chatbot communicates with the user, the more information it gathers. It updates its model with the help of growing data to deliver accurate answers. This sort of AI likewise upholds conversational AI instead of unnatural, pre-programmed interactions.

B. Machine Learning Chatbots

The ML chatbots are data-driven, they learn from patterns, conversations, and previous experiences. The more data we inject, the more diverse conversations they can handle in the future. They learn from past data and develop the nature of their responses. Up to this point, machine learning chatbots offer the best user engagement as they interact with the users just like a person would do. They are the nearing the replication of human-interaction experience.

C. Generative Chatbots

A generative chatbot is an open domain chatbot program that creates unique mixes of language rather than selecting from pre-defined responses. Generally, seq2seq models which used for machine translation can be used to build generative chatbots. This model, otherwise called the encoder-decoder model, utilizes long haul and momentary memory LSTMs to create text from the preparation dataset. The seq2seq model is likewise valuable in machine interpretation applications. After foreseeing the word entered by the user, it will anticipate every one of the accompanying words utilizing the likelihood of event of that word.

D. Rule based Chatbot

A rule based chatbot utilizes a tree-like stream rather than AI to assist visitors with their questions. This implies that the chatbot will direct the visitor with follow-up inquiries to get to the right goal at last. The designs and answers are pre-characterized with the goal that you are in charge of the discussion. This implies that the chatbot will eventually directs the users with questions to find the right solution. All patterns and responses are predefined for the user to take control of their conversations. Also another reason why all the questions need to be direct and basic. The Rule-based chatbots can either be built by simple or complex codes but the bot will constantly follow the code protocol, it will not do anything beyond it.

III. PROPOSED SOLUTION

Our system that we are proposing will get the queries or questions from the user for the location Andaman and Nicobar island in the travel application. With the help of the data in the form of intents the patterns and responses are pre-processed and the answers would be displayed. The bot is trained in such a way that it will give provide a relevant response to any diverse questions.
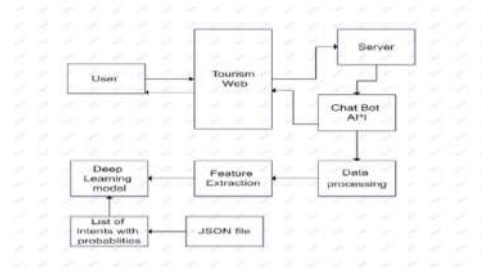
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Fig. 1 Overview of Chatbot

IV. IMPLEMENTATION

The chatbot will be instructed on the dataset that contains tags,patterns, and responses. This chatbot can be created using Neural network, RNN, LTSM, Keras, Python. In this system, we are using python. The process as three stages.

A. The First Stage is Preparing the Data File

It is created with all the possible predefined responses. A data file is stored in a JSON including the tags and patterns.

B. Second Stage is Pre-Processing the Data

1) Tokenization: which assigns a unique token to each distinct word.

2) Padding: is the process to get all the data to the same length to send it to a deep neural network. The variable lengths of the input sequence of data is converted to an equal length format. This task is achieved using padding in TensorFlow Keras.

3) Label Encoding: converts the labels into a numeric form to convert them into the machine-readable form.

Fig. 2 Tokenization

C. Third Stage is Building and Testing the Neural Network.

An artificial neural network with several layers in between the input and output layers is called as deep neural network. It resembles the complex neural structure of a human brain[2].

Using RNN which works on the principle of saving the output of a particular layer and feeding this back to the input to predict the output of the layer. The Recurrent Neural Network will normalize the different actuation works and loads and inclinations so that each hidden layer has similar boundaries. Then, rather than making different hidden layers, it will make one and circle over it however many times as required. LSTMs are a unique sort of RNN fit for learning long haul conditions by recollecting data for significant stretches is the default conduct. All RNN are as a chain of rehashing modules of a brain organization.

The Network comprise of an embedding layer which is quite possibly of the most remarkable thing in the field of NLP. The result of the embedding layer is the contribution of the recurrent layer with lstm door. then, the result is flattened, and a customary thick layer is utilized with a SoftMax enactment capability. The primary part is the implanting layer which gives has a relating vector for each word in the dataset Soft-max is a capability that is being utilized. With Soft-max, the information can be arranged by the immediate classifier.
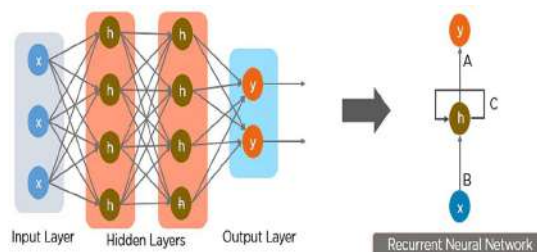

Fig.3 Recurrent Neural Network

Epoch is one complete pass of the training dataset through the algorithm. Passing the entire dataset through a neural network is not enough. And we need to pass the full dataset multiple times to the same neural network. Below is the model accuracy.

```
Epoch 9/200
2/2 [==============================] - 0s 0s/step - loss: 2.2898 - accuracy: 0.2609
Epoch 10/200
2/2 [==============================] - 0s 0s/step - loss: 2.2879 - accuracy: 0.2826
Epoch 11/200
2/2 [==============================] - 0s 0s/step - loss: 2.2862 - accuracy: 0.2391
Epoch 12/200
2/2 [==============================] - 0s 0s/step - loss: 2.2841 - accuracy: 0.2391
Epoch 13/200
...
Epoch 199/200
2/2 [==============================] - 0s 0s/step - loss: 0.2207 - accuracy: 1.0000
Epoch 200/200
2/2 [==============================] - 0s 0s/step - loss: 0.2195 - accuracy: 1.0000
```

Fig.4 Model Accuracy

V. CONCLUSION

In conclusion, our proposed chatbot using deep learning which assists users with getting travel information they need 24/7. Users will be able to get detailed information of all tourist attractions, activities, culture, heritage and other information of Andaman and Nicobar Island. This allows users to receive satisfactory user assistance through the chatbot. Chatbots are great tools for human- computer interaction. With the help of neural network this model is intended to get quick responses from bots to all the user inquiries right away.

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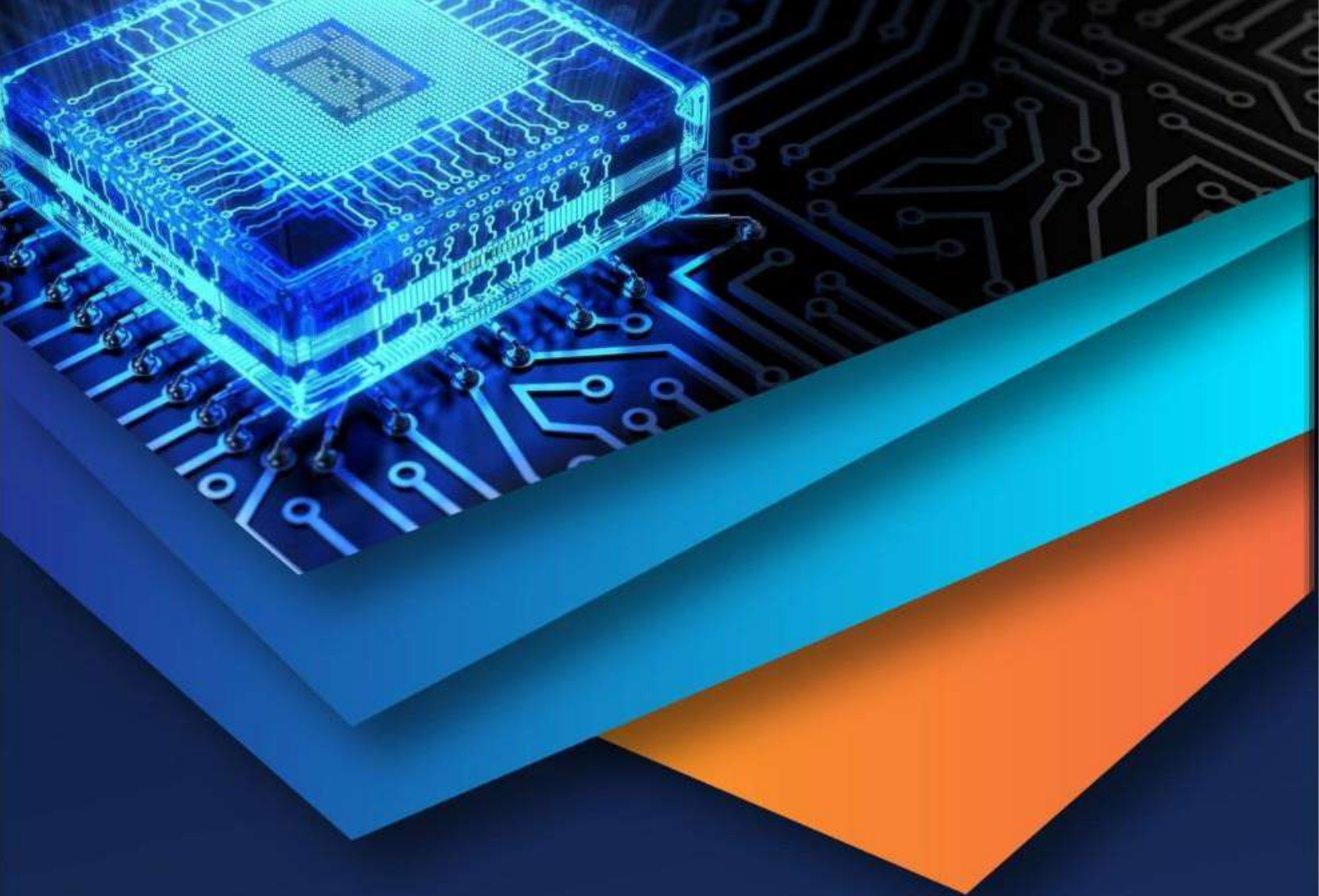
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