ISSN No.: 2455-6130
Special Issue: 2, 2022, pp. 151-157

website: www.ijoetr.com

International Journal of Emerging Trends in Research

Virtual Tourist Guide: A Real-Time Image Processing and Recommendation System using Cloud Services

Dnyaneshwari Raskar[1], Aditi[2], Rounak[3], Tejas Patil[4], Wasudeo Rahane[5]

[1]*Dept.of Information Technology, NBN Sinhgad School Of Engineering, Pune*

Abstract

The Indian tourism and hospitality business plays a major role in the advancement of the service jobs in India. Considering the rich cultural and historical heritage, variety in ecology and natural attractions, tourism in India has substantial potential. According to Invest India National Investment Promotion and Facilitation Agency, India has a share of 1.5% in World Tourist Arrivals and the travel market is predicted to reach US$ 125 billion by FY27 from an estimated US$ 75 billion in FY20. Also the number of jobs in tourism sector, are expected to climb to 53 million by 2029. India is one of the most digitally advanced travellers nation in terms of digital tools being used for planning, booking and experiencing a journey. There is an extensive range of solutions in the market that cater to needs of the tourism industry. However majority of these solutions concentrate on either an information provider or on providing some tourist services, and there is a lack of studies for providing unified measures to meet both the needs. The purpose of this "Virtual Tourist Guide" is to overcome these needs and provide effortless, secure and user friendly solutions for tourism management.

Keywords: E-Tourism; Web Applications; Image Classification; Chat-bot;

1. Introduction

Tourism is the most vital and quickest growing industries. India is a major tourist destination as it is one of the most religiously and ethnically diverse nations in the world. Due to which there is high inflow of domestic and foreign tourists who visit India.. The demand for work force in tourism within the current scenario isn't sufficient. The data which is being provided by guide has no proof of authenticity. "Virtual Tourist Guide" is an application that enhances the tourism experience by providing navigation and information sharing features. It is an "all in one" platform for all the features required within an application based tourist guide. The purpose of this interactive virtual guide is to assist and encourage tourists to go to different and exciting tourist places . "Virtual Tourist Guide", aims to help the tourist to understand the visited place in an elite manner.

2. **Literature survey**

In tourism and hospitality industry, which solely relies on offering services, the word-of-mouth has a very special place. The word-of-mouth is directly related to expressing human feelings and emotions towards different experiences. The AR applications[2] can bolster the emotional connection of tourists to destinations that in turn leads to repeated sales and business.
A mobile application that implements Augmented Reality (AR) technology[1] to fetch information about landmarks by capturing live images. As, Augmented Reality (AR) only on its own is still in its developmental stages a combination approach of AR and text based features can help overcome inadequacies of AR. An android based local tourist guide information provider[7] is utilized. However, local tourist guides may not be the most reliable source for accurate information as it reflects poor accuracy. To subdue this hurdle a more accurate information source can be integrated.
Context is defined by announcing a set of Objectives and Businesses and providing a sample of customer names. Objectives refer to the different types of questions a chatbot faces (e.g. "Sales Question" or "Support Question"), while Businesses refer to specific information sources required to process the query (e.g. "Product Name" or "Error Code"). Responses can be defined using standing answers such as "Sure, I will process your order", or they can be redirected to a complex processing pipe that involves performing one or more business functions. This function can also serve as a cheat sheet for chatbot engineers to check the use of their operating case[3]. Lex provides a well-written user guide to access its AWS CLI (command-line interface) for Lex related activities. However, Lex does not provide a way to provide immediate feedback to the user. The filling step should be completed (either by requesting a Lambda job or by returning the boundaries to the client). Only after the completion of the fulfillment, the consistent response can be displayed. In Lex, while context variables can be used for all purposes, they cannot be set in the UI. They should be based on the answers provided by Lambda Functions.
Content-based image recognition and retrieval programs (CBIR)[4] often analyze image content by subtle features, such as color, texture, and shape. In order to achieve the highest efficiency of semantic retrieval, modern systems often combine low-level and high-quality features that contain human psychological information. However, such combinations increase the time and memory requirements as well as the complexity of the acquisition of the element removal process. By using the same information, interpersonal and internal relationships, a larger vote is used in the results of these processes as a means of deciding to select appropriate features. The proposed feature selection and measurement method can be used to improve image retrieval functionality based on semantic content, reduce the complexity of the retrieval process, and improve system usability for end users.
Object detection requires a process of image processing to detect an object in a photograph captured by a camera. Finding an object requires a process of front and back separation[8]. However, since the computer is capable of distinguishing the front and back of the image itself, image processing technology capable of distinguishing the front and back is required. Image processing technology analyzes and provides image information so that it can process and understand image features and information needed in the system. However, the algorithm for obtaining objects using existing CNN separators has the problem that processing time increases and real-time processing is difficult when objects are separated from the image

3. **Proposed Work**

A. *Methodology*

This system handles boundaries of the current Computer Vision techniques that prevent the implementation of mature Augmented Reality applications[1]. To overcome these limitations, we propose a web application with real time image processing using tensor flow pre-trained model, a chat-bot using Amazon Lex service and interactive and easy to use interface.

Through this web application, we aim to provide authentic information about the tourist attraction from the data available in the database to the user. Also, providing users, ease to interact with the application through life-like conversational bot using Amazon Lex.

Thus, this application provides users, all of the functions on their fingertip.

B. *Dependency*

- Data
- Internet
- Camera and speaker

C. *Nature of proposed work*

- Using mobile phone camera, click the picture of the tourist attraction.
- Web application will make an API call for each service that is being provided.
- The web services will respond to those calls and get back to the application with a result which will be showcased properly by the application with a better UI experience.
- If the user wishes the result may be conveyed vocally to the user.

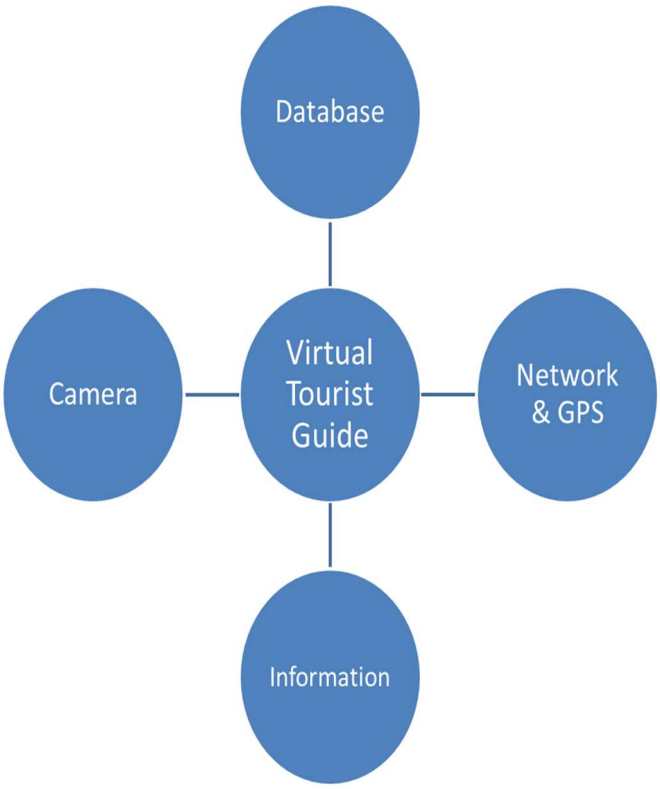

Fig. 1. Use case diagram

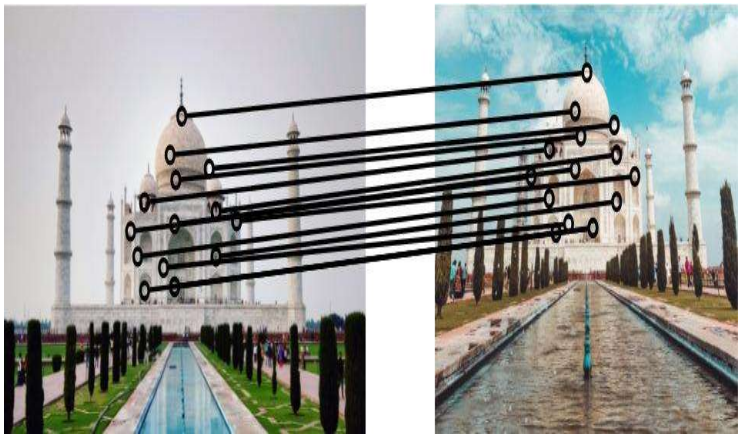

Fig. 2. Image Processing of sample tourist attraction

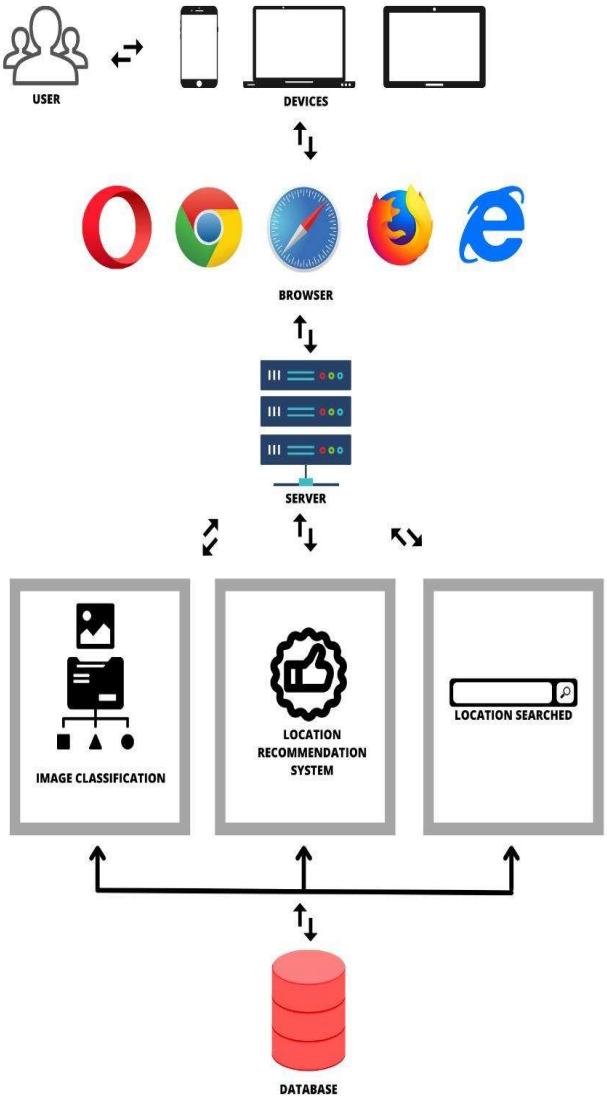

Fig. 3. System architecture

D. Proposed System

The proposed system can be implemented by using following technologies -

Amazon lex is a service for creating conversational interfaces for applications that use speech and text. Amazon lex offers high deep learning capabilities, Automatic Speech Recognition (ASR) for converting speech to text and Natural Language Understanding (NLU) for detection of text intent. With the help of Amazon lex you can easily develop elegant chat-bots in natural language.

Workflow of Chat-bot:

The user interacts with the web application, authenticates itself (handled by AWS IAM Authentication service), and then navigates to messaging page. Every message from the user is then validated against the checks using AWS Lambda functions that is hooked to AWS Lex service.

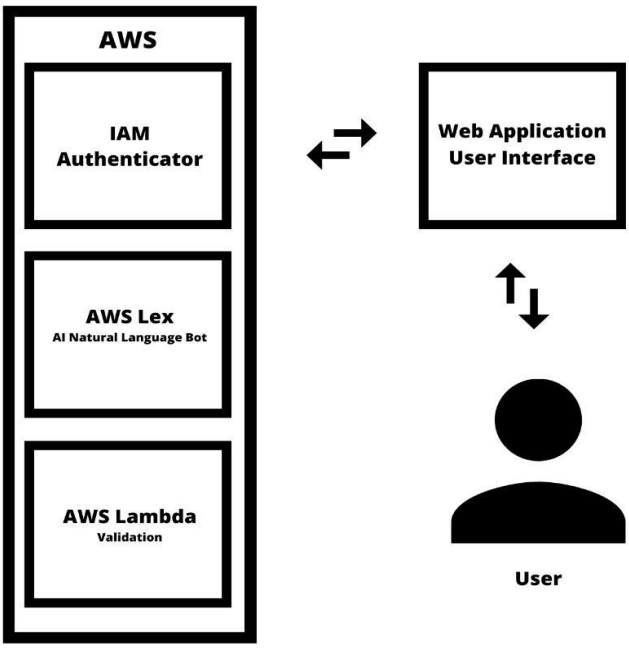

Fig. 4. Chatbot Workflow on Amazon Cloud

Ajax creates fast and dynamic websites. Another advantage of Ajax is that it enables web pages to be updated on the flow. Hence,

JQuery is a JavaScript library which enables you to use JavaScript on your websites in an easier manner. JQuery packages common tasks requiring many line of code into single line code.

React is an open source frontend javascript library which brings about the creation of interactive user interfaces by building component based interfaces.

Django is a python web framework providing a powerful form library handling the rendering forms as HTML, validating data submitted by users and converting the data into native python types.

Tensorflow uses DELF Module for landmark detection. The image is resized and cropped and using tensorflow trained weighted model, we can classify and predict the image class.

4. Conclusions

We studied how we will implement and develop an application which will be useful for tourists. This study has found that the traditional method used has many flaws or ambiguities which can be fixed to provide better user experience. Hence the work can be implemented with better approach and technology to provide better experience to the user.

References

[1] HARINI B, ASHMITHA K, DEEPAN RAJ K R, JANANI S R, "Virtual tourist guide", International Research Journal of Engineering and Technology (IRJET),Vol.08,pp.1752-1754 March 2021

[2] Needa Shabani, Arslan Munir, Azizul Hassan, "E-Marketing via Augmented Reality: A Case Study in the Tourism and Hospitality Industry", IEEE Potentials, January 2019

[3] S. Srivastava and T. Prabhakar, "Desirable Features of a Chatbot-building Platform," in 2020 IEEE International Conference on Humanized Computing and Communication with Artificial Intelligence (HCCAI), Irvine, CA, USA, 2020 pp. 61-64.

[4] Schettini R., Ciocca G., Gagliardi I. (2009) Feature Extraction for Content-Based Image Retrieval. In: LIU L., ÖZSU M.T. (eds) Encyclopedia of Database Systems. Springer, Boston, MA.

[5] Samuel, Isaac & Ogunkeye, Fiyinfoba & Olajube, Ayobami & Awelewa, Ayokunle. (2020). Development of a Voice Chatbot for Payment Using Amazon Lex Service with Eyowo as the Payment Platform. 104-108. 10.1109/DASA51403.2020.9317214.

[6] Preethi Harris, Rihan Siddhi, S.Sricharan, B.Suntharam, "Bon voyage: a travel guide based on web application", International Research Journal of Engineering and Technology (IRJET),Vol.06,pp.5222-5226 March 2019

[7] Wali ,Muhammad & Akbar, Rizaldi & Iqbal, Taufiq & Al-Bahri, Putraga. (2019). Development Of An Android-Based Tourism Guide (A Case Study : Sabang City, Indonesia). International Journal of Scientific & Technology Research. 8. 887-893

[8] Ahn, H., Cho, HJ Research of multi-object detection and tracking using machine learning based on knowledge for video surveillance system. Pers Ubiquit Comput 26, 385–394 (2022).

[9] Rapp, Amon & Curti, Lorenzo & Boldi, Arianna. (2021). The human side of human-chatbot interaction: A systematic literature review of ten years of research on text-based chatbots. International Journal of Human-Computer Studies. 151. 102630. 10.1016/j.ijhcs.2021.102630

[10] R. F. Schaefer and H. Boche, "Physical Layer Service Integration in Wireless Networks : Signal processing challenges," in IEEE Signal Processing Magazine, vol. 31, no. 3, pp. 147-156, May 2014, doi: 10.1109/MSP.2013.2271190

[11] C. Srisawatsakul and W. Boontarig, "Tourism Recommender System using Machine Learning Based on User's Public Instagram Photos," 2020 - 5th International Conference on Information Technology (InCIT), 2020, pp. 276-281, doi: 10.1109/InCIT50588.2020.9310777.

[12] M . Tenemaza, S. Luján-Mora, A. De Antonio and J. Ramírez, "Improving Itinerary Recommendations for Tourists Through Metaheuristic Algorithms: An Optimization Proposal," in IEEE Access, vol. 8, pp. 79003-79023, 2020

[13] G. Kostadinov, K. Milev, S. Staynov and A. Stoyanova-Doycheva, "Algorithm for Genrerating and Visualizing Routes of an Intelligent Tourist Guide," 2020 International Conference Automatics and Informatics (ICAI), 2020, pp. 1-5, doi: 10.1109/ICAI50593.2020.9311310

[14] K. K. D. N. Dilshan, U. M. D. M. Parussella, H. M. C. J. Herath, C. A. J. P. Chandranath, S. Thelijjagoda and T. Jayalath, "JESSY: An Intelligence Travel Assistant," 2021 3rd

International Conference on Advancements in Computing (ICAC), 2021, pp. 413-418, doi: 10.1109/ICAC54203.2021.9671229

[15] D. S. Maylawati et al., "Chatbot for Virtual Travel Assistant with Random Forest and Rapid Automatic Keyword Extraction," 2021 IEEE 7th International Conference on Computing, Engineering and Design (ICCED), 2021, pp. 1-6, doi: 10.1109/ICCED53389.2021.9664876.

[16] Y. Wang, "Hotel Recommendation based on Review Analysis by Considering Tourism Needs," 2022 16th International Conference on Ubiquitous Information Management and Communication (IMCOM), 2022, pp. 1-8, doi: 10.1109/IMCOM53663.2022.9721727.

[17] Paolanti, M., Mancini, A., Frontoni, E. et al. Tourism destination management using sentiment analysis and geo-location information: a deep learning approach. Inf Technol Tourism 23, 241–264 (2021).

[18] X. Kong, L. Zhang and R. Tan, "Design of tourism marketing management system based on SWOT analysis," 2021 International Conference on Intelligent Transportation, Big Data & Smart City (ICITBS), 2021, pp. 86-89, doi: 10.1109/ICITBS53129.2021.00030

[19] O. Alnogaithan, , S. Algazlan, A. Aljuraiban and A. A. Shargabi, "Tourism Recommendation System Based on User Reviews," 2019 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies (3ICT), 2019, pp. 1-5, doi: 10.1109/3ICT.2019.8910312

[20] T. Wenan, D. Shrestha, D. Shrestha, B. Gaudel and S. R. Jeong, "Analysis and Design of Tourism Recommender System for Religious Destinations of Nepal," 2020 IEEE International Conference on Sustainable Engineering and Creative Computing (ICSECC), 2020, pp. 214-220, doi: 10.1109/ICSECC51444.2020.9557574,