International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 01 | Jan 2022 www.irjet.net p-ISSN: 2395-0072

A Review on Tourist Analyzer

Yash Maroo[1], Sairaj Marshetty[2], Aditi More[3], Pawan Gond[4], Hemalata Mote[5]

[1,2,3,4]B.E. Student, Dept. of Electronics and Telecommunication, Atharva College of Engineering, Mumbai, India
[5]Professor, Dept. of Electronics and Telecommunication, Atharva College of Engineering, Mumbai, India

---

Abstract - *Tourism is one of the fastest growing industries today. It is one of the profitable spheres of the world economy. Tourists use mobile devices and e-tourism service during their tour. Data analytics is now the technique that is growing in importance in the industry. In the tourism area, behavior analysis can provide a meaningful difference in the way in which business is traditionally done. With modern solutions, the work can be done quickly and with better outcomes. Therefore, it would be beneficial for the tourists as well as the people involved in the tourism industry by facilitating quicker services to the tourists, thus augmenting contentment and fidelity. We aim to design a 'Big Data Analytics' method to support strategic decision making in tourism destination management.*

Key Words: **Tourism, data analytics, behaviour analysis, tourism industry, big data analytics.**

1.INTRODUCTION

World tourism is considered as a significant factor in the economy of many nations. Today tourism related infrastructure in various parts of the country has improved the quality of life of the local people and helped to promote local arts and crafts. Tourism has contributed to increase awareness about conservation of the environment and the cultural heritage. Tourism is the fastest growing industry in modern world. People have always travelled to distant parts of the world to see monuments, arts and culture, taste new cuisine etc. The term tourist was firstly used as official term in 1937 by the League of Nations. Tourism was defined as people travelling abroad for period of over 24 hours.

Global Tourism is one of the most profitable sectors of the world economy. Around 1.5 billion international tourist arrivals were recorded in 2019. The number of international travels is expected to increase by 3.3% per year between 2010 and 2030. So, international tourist arrivals will reach 1.9 billion till 2030.

Understanding of travel behaviour and activity pattern of tourist plays a significant role in effective tourism management. Insights regarding travel behaviour, especially the spatial behaviour and movement pattern of tourism are a fundamental information to learn. They can be used to develop management strategies including activity and route development, attraction package, attraction planning, and using to make attraction or trip recommender system. These empower tourism practitioners to serve traveller in a more satisfactory manner. A Design artefact is a method designed to process and analyse social media big data, such as geotagged photos, together with their associated personal and meta-data, to support destination management organisations (DMO's) strategic decision-making within the context of Tourist destination management. The proposed work included four combinational techniques: textual metadata processing, geographical data clustering, representative photo identification and time series modelling. Also, they used geotagged photo data publicly available on the photo-sharing website, Flickr.

The remainder of the paper is structured as follows. Section II presents the Literature Review and Section III provides Conclusion.

2. LITERATURE REVIEW

Authors of the paper [1] propose P-DBSCAN, a new density-based clustering algorithm based on DBSCAN for analysis of places and events using a collection of geo-tagged photos. It is a variation of DBSCAN for analysis of places and events using a collection of geo-tagged photos. Representative landmark images were found on the city and country scales in combining coordinates of geo-tagged photos with content based and textual analysis using Mean-Shift algorithm based on kernel-density estimation for clustering. Authors collected metadata of geo-tagged photos from Flickr using its publicly available API.

The paper [2] presents a framework to identify the interests of tourists by integrating information carried by the geotagged photos shared on social media websites. Such an approach is expected to provide sustainable tracking on popular places of interest (POIs) updated by tourists and pick the best representative photos taken by them. The performance of the model was evaluated by conducting a case study using the geotagged photos taken in Hong Kong.
The authors of the paper [3] describe tourist behavior mining from analyzing photo content by using a computer deep learning model. 35356 Flickr tourist's photos are identified into 103 scenes and analyzed by ResNet-101 Deep learning model. Tourist's cognitive maps with different perceptual themes are visualized by the authors according to photos geographical information. Statistical analysis and spatial analysis (by using hierarchical clustering analysis and ANOVA (analysis of variance)) are used for analyzing tourist behavior.

The work proposed in paper [4] a new method to classify tourist areas following specific characteristics. An original method to rank and compare tourist cities through data related to tourist social networks is proposed. In the first part, they presented the data and the ten indicators which was used to characterize each tourist destination. In the second part, some analysis based on these indicators to compare French tourist destinations that share some features was proposed. In the final part, they focused on future work ideas. For each indicator, they used the Jenks natural breaks classification to rank values in different class. This data clustering method allows to reduce the variance within classes and to maximize the variance between classes.

The authors of paper [5] presented a tourist behaviour analysis system based on a digital pattern of life concept. The digital pattern of life extracts tourist's behaviour components in a convenient form for analysis and is based on an ontological approach, which allows to take tourist, city and POI context information into consideration. Digital pattern of life provides a versatile and convenient representation of the tourist regardless of source selection. Changes of tourist actions can be viewed in a specific time window, since the digital pattern of life information is stored with the time reference.

The paper [6] propose a mobile application, which will take the user's interest and recommend attractions, restaurants, and hotels. The system is trained using the dataset of TripAdvisor. The clustering of the training dataset is done using K-modes clustering which is an unsupervised learning algorithm. With the use of Convolutional Neural Networks, reverse image search is done for a dataset created by web scraping images from Google. The application receives the data in the JSON format from the MySQL Database using Python Flask Server.

The work described in paper [7] propose a framework containing an improved cluster method and multiple neural network models to extract representative images of tourist attractions. Firstly, the authors proposed a novel time- and user-constrained density-joinable cluster method (TU-DJ-Cluster), specific to photos with similar geotags to detect place-relevant tags. Then they merge and extend the clusters according to the similarity between pairs of tag embeddings, as trained from Word2Vec. Based on the clustering result, they filter noise images with Multilayer Perceptron and a single-shot multi-box detector model, and further select representative images with the deep ranking model. The authors selected Beijing as the study area.

The authors of paper [8] presented an approach for exploring tourist's behavior based on the extracted dataset from geotagged photographs. The authors transformed the dataset to a suitable format type and applied k-mean clustering to cluster the different tourists' behavior. After that, the tourist's behavior of each cluster, especially behavior regards interesting attraction, was analyzed by statistical test.

The paper [9] presents a framework based on distributed Map / Reduce to carry out research and analysis of the flow behavior of tourists, with better efficiency and scalability. By using a big data platform, this paper analyzes the track data of tourists' mobile phone, find out the behavior patterns of tourists, and design an analysis of the tourist flows based on the traditional data warehouse, Hadoop cluster and the database of My SQL, which includes three modules.

The work described in paper [10] proposed an original approach to characterize daily behaviors of tourists by analyzing sequences of places visited during a day by each tourist based on geo-located and time-related information left by tourists by posting their photographs on photo sharing websites like Instagram, Flickr and Panoramio. The authors used R with TraMineR6 package that is based on the Needleman-Wunsch algorithm as optimal matching.

The paper [11] uses sequential patterns of tourist activities and locations from social medias as main source of behaviour data. The Convolutional Long Short-Term Deep Learning method is used for prediction of the expected location. The proposed method combines Convolutional Neural Network (CNN) with Long Short-Term Memory (LSTM). The paper authors state that their solution outperforms other neural network models when evaluating with the accuracy and loss metrics.

The authors of paper [12] presented a work to analyze intra-regional spatial patterns mining tourists' behaviors and characteristics based on traveling group size with data collected from Airbnb open source focused on Los Angeles neighbourhood in 2016. Random Forest Classification (RF) technique was applied to identify the key drivers according to relevant traveller groups and presented patterns using Hotspot Analysis on Geographic Information System (GIS). Their result highlights driving factors within Airbnb listings, providing valuable insights to better plan, monitor and manage tourism activity.

The work described in paper [13] proposed a cognitive map of Tourist behaviour based on Trip Advisor. The objective of this paper was to identify, based on data from Tripadvisor, tourist behavior in how users rate a tourist place. Firstly, they proposed different correspondence analyses (CA) on data from Tripadvisor to discover pairwise dependences between data properties (e.g. rating vs. place type, age vs. country). Secondly, they merge and map all the CA results as a cognitive map, both to bring out and understand influences between the studied concepts and to make easier human visualization.

3. CONCLUSION

The behaviour of tourists is the most important indicator or predictor of future tourist behaviour. Tourist behaviour occurs in the planning and implementation stages of the holidays, and also after they return home. In order for the

tour operator or destination to assess the relevance of its marketing and operational approaches to the development, marketing and implementation of tourism activities, it is necessary to recognize the different forms of behaviour in each stage. We have reviewed various different methodologies such as P-DBSCAN, ResNet-101 Deep learning model, Convolutional Long Short-Term Deep Learning method related to Tourist Analyzer in this review paper.

REFERENCES

[1] Kisilevich, S., Mansmann, F., & Keim, D. (2010). P-DBSCAN: a density based clustering algorithm for exploration and analysis of attractive areas using collections of geo-tagged photos BT - Proceedings of the 1st International Conference and Exhibition on Computing for Geospatial Research & Applicat. 1–4.

[2] Zhong, L., Yang, L., Rong, J., & Kong, H. (2020). A Big Data Framework to Identify Tourist Interests Based on Geotagged Travel Photos. IEEE Access, 8, 85294–85308. https://doi.org/10.1109/ACCESS.2020.2990949

[3] Zhang, K., Chen, Y., & Li, C. (2019). Discovering the tourists' behaviors and perceptions in a tourism destination by analyzing photos' visual content with a computer deep learning model: The case of Beijing. Tourism Management, 75(November), 595–608. https://doi.org/10.1016/j.tourman.2019.07.002

[4] Chareyron, G., Branchet, B., & Jacquot, S. (2015). A new area tourist ranking method. Proceedings - 2015 IEEE International Conference on Big Data, IEEE Big Data 2015, 2930–2932. https://doi.org/10.1109/BigData.2015.7364126

[5] S. Mikhailov, A. Kashevnik and A. Smirnov, "Tourist Behaviour Analysis Based on Digital Pattern of Life," 2020 7th International Conference on Control, Decision and Information Technologies (CoDIT), 2020, pp. 622-627, doi: 10.1109/CoDIT49905.2020.9263945.

[6] Parikh, V., Keskar, M., Dharia, D., & Gotmare, P. (2018). A Tourist Place Recommendation and Recognition System. Proceedings of the International Conference on Inventive Communication and Computational Technologies, ICICCT 2018, Icicct, 218–222. https://doi.org/10.1109/ICICCT.2018.8473077

[7] Han, S., Ren, F., Du, Q., & Gui, D. (2020). Extracting representative images of tourist attractions from flickr by combining an improved cluster method and multiple deep learning models. ISPRS International Journal of Geo-Information, 9(2), 1–22. https://doi.org/10.3390/ijgi9020081

[8] Arthan, S., Jandum, K., & Tamee, K. (2021). Exploring Tourist Behavior from Social Media Using Geotagged Photographs. 2021 Joint 6th International Conference on Digital Arts, Media and Technology with 4th ECTI Northern Section Conference on Electrical, Electronics, Computer and Telecommunication Engineering, ECTI DAMT and NCON 2021, 285–288. https://doi.org/10.1109/ECTIDAMTNCON51128.2021.9425761

[9] Lu, D. D., & Zhong, Y. De. (2016). A tourist flows analysis system based on phone big data. Proceedings of 2016 IEEE International Conference on Big Data Analysis, ICBDA 2016. https://doi.org/10.1109/ICBDA.2016.7509822

[10] Loiseau, T. J., Djebali, S., Raimbault, T., Branchet, B., & Chareyron, G. (2017). Characterization of daily tourism behaviors based on place sequence analysis from photo sharing websites. Proceedings - 2017 IEEE International Conference on Big Data, Big Data 2017, 2018-Janua, 2760–2765. https://doi.org/10.1109/BigData.2017.8258241

[11] Kanjanasupawan, J., Chen, Y. C., Thaipisutikul, T., Shih, T. K., & Srivihok, A. (2019). Prediction of tourist behaviour: Tourist visiting places by adapting convolutional long short-Term deep learning. Proceedings of 2019 International Conference on System Science and Engineering, ICSSE 2019, 12–17. https://doi.org/10.1109/ICSSE.2019.8823542

[12] Lee, Y. Y., & Chang, Y. L. (2019). Uncovering los angeles tourists' patterns using geospatial analysis and supervised machine learning with random forest predictors. Proceedings - 6th Annual Conference on Computational Science and Computational Intelligence, CSCI 2019, 1275–1280. https://doi.org/10.1109/CSCI49370.2019.00239

[13] Raimbault, T., Chareyron, G., & Krzyzanowski-Guillot, C. (2015). Cognitive map of tourist behavior based on Tripadvisor. Proceedings - 2014 IEEE International Conference on Big Data, IEEE Big Data 2014, June, 55–57. https://doi.org/10.1109/BigData.2014.7004492