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A DECISION TREE BASED RECOMMENDATION SYSTEM FOR TOURISTS

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ABSTRACT

Choosing a tourist destination from the information that is available on the Internet and through other sources is one of the most complex tasks for tourists when planning travel, both before and during travel. Previous Travel Recommendation Systems (TRSs) have attempted to solve this problem. However, some of the technical aspects such as system accuracy and the practical aspects such as usability and satisfaction have been neglected. To address this issue, it requires a full understanding of the tourists' decision-making and novel models for their information search process. This paper proposes a novel human-centric TRS that recommends destinations to tourists in an unfamiliar city. It considers both technical and practical aspects using a real- world data set we collected. The system is developed using a two-step feature selection method to reduce number of inputs to the system and recommendations are provided by decision tree C4.5. The experimental results show that the proposed TRS can provide personalized recommendation on tourist destinations that satisfy the tourists.

INDEX : tourist, destination , trss, c4.5 decision tree,

1.INTRODUCTION

1.1 INTRODUCTION:

Problem statement :

Choosing a tourist destination from the information that is available on the Internet and through other sources is one of the most complex tasks for tourists when planning travel, both before and during travel. Previous Travel Recommendation Systems (TRSs) have attempted to solve this problem. However, some of the technical aspects such as system accuracy and the practical aspects such as usability and satisfaction have been neglected.

Motivation:

To address this issue, it requires a full understanding of the tourists' decision-making and novel models for their information search process. This paper proposes a novel human-centric TRS that recommends destinations to tourists in an unfamiliar city. It considers both technical and practical aspects using a real world data set we collected. The system is developed using a two- steps feature selection method to reduce number of inputs to the system and recommendations are provided by decision tree C4.5. The experimental results show that the proposed TRS can provide personalized recommendation on tourist destinations that satisfy the tourists.

Objective:

a tourist destination from the information that is available on the Internet and through other sources is one of the most complex tasks for tourists when planning travel, both before and during travel. Previous Travel Recommendation Systems (TRSs) have attempted to solve this problem. However, some of the technical aspects such as system accuracy and the practical aspects such as usability and satisfaction have been neglected. To address this issue, it requires a full understanding of the tourists' decision-making and novel models for their information search process.

2. LITERATURE SURVEY

1. Enhancing Tourist Experience through Machine Learning-Based Recommendations

This literature survey investigates the application of machine learning techniques in optimizing tourist experiences. Through a comprehensive review of existing research, the study examines various approaches such as collaborative filtering, content-based recommendation, and hybrid models. Additionally, it explores the integration of emerging technologies like natural language processing and reinforcement learning to further enhance recommendation systems. The survey identifies key trends, challenges, and opportunities in leveraging machine learning for personalized tourist recommendations, aiming to provide insight for future research and industry applications.

2. Decision Tree Algorithms in Tourism: Opportunities and Challenges

This study delves into the realm of decision tree algorithms, specifically examining their relevance within tourist recommendation frameworks. Through rigorous experimentation employing authentic tourist datasets, the research scrutinizes the efficacy and scalability of decision tree models. The results unveil promising prospects in terms of interpretability and computational performance.

Additionally, the study identifies key challenges that must be addressed to leverage decision tree algorithms optimally within the tourism domain. These challenges encompass issues such as handling large-scale data, ensuring robustness to dynamic tourist preferences, and incorporating real-time updates. Furthermore, the research highlights the importance of interpretability in decision-making processes within tourism recommendation systems, emphasizing the need for transparent and comprehensible models to gain user trust and acceptance.

3. Personalized Tourist Recommendations Using Decision Trees

This paper delves into the development of a decision tree-based recommendation system tailored for tourists exploring a renowned destination. By amalgamating diverse data streams including user preferences, geographical data, and past reviews, the system exhibits superior levels of personalization. The case study elucidates how integrating these factors enhances the tourist experience while also shedding light on user satisfaction metrics and the adoption rates of the system. Additionally, the research explores the practical implications of employing decision tree algorithms in tourist recommendation systems, emphasizing the importance of adaptability and scalability to accommodate varying user needs and preferences. Furthermore, the study underscores the significance of leveraging decision tree models to provide tailored recommendations that enhance engagement and satisfaction among tourists, thereby contributing to the overall success of tourism initiatives.

3. PROBLEM STATEMENT

1.Approach:

Typically, existing TRSs may utilize algorithms like collaborative filtering, content-based filtering, or hybrid methods to recommend tourist destinations.

2.Technical Aspects:

Accuracy: Existing systems may face challenges in achieving high accuracy due to the complexity of tourist preferences and evolving user behavior.

3.Practical Aspects:

Usability: Some existing TRSs might have limitations in terms of user-friendly interfaces, making it difficult for users to interact seamlessly.

4.Data Utilization:

Previous systems may not effectively utilize real-world data or may rely on limited datasets, impacting the diversity and relevance of recommendations.

5.Decision-Making Model:

The decision-making process in traditional TRSs may not fully align with the tourists' decision-making patterns, leading to less personalized recommendations.

DISADVANTAGES:

1. Approach:

Limited Recommendation Accuracy: Algorithms like collaborative filtering or content-based filtering may not capture the nuanced preferences of tourists accurately, leading to recommendations that don't fully match their interests. Inflexibility in Handling Evolving Preferences: Existing algorithms might struggle to adapt to changing trends or evolving user preferences, resulting in recommendations that become less relevant over time.

2. Technical Aspects:

Challenges in Achieving High Accuracy: Despite advancements, achieving high accuracy in recommending tourist destinations remains a challenge due to the diverse and subjective nature of tourist preferences. Resource-Intensive Algorithms: Some algorithms may require significant computational resources, making them impractical for real-time or large-scale deployment.

3. Practical Aspects:

Poor User Experience: TRSs with complex interfaces may deter users from engaging with the system, leading to low adoption rates and reduced effectiveness. Limited Accessibility: Systems with usability limitations might exclude certain demographics, such as older or less tech-savvy users, from accessing valuable travel recommendations.

4. Data Utilization:

Dependency on Limited Datasets: Some systems may rely on outdated or insufficient datasets, resulting in recommendations that lack diversity and fail to capture emerging tourist preferences.

Privacy Concerns: Utilizing real-world data might raise privacy concerns among users, especially if their personal information is used without adequate consent or protection.

5. Decision-Making Model:

Lack of Personalization: Traditional decision-making models might generalize tourist preferences, leading to recommendations that don't cater to individual tastes and preferences. Inability to Capture Contextual Factors: Existing models may overlook contextual factors such as current events, local festivals, or special promotions, which can significantly influence tourists' decision-making processes.

4. PROPOSED SYSTEM & IT'S ADVANTAGES:

1. Approach:

The proposed TRS adopts a human-centric approach, emphasizing a thorough understanding of tourists' decision-making processes in unfamiliar cities.

2. Technical Aspects:

A two-step feature selection method is introduced to reduce the number of inputs, potentially addressing issues related to the complexity of data and improving system accuracy.

3. Practical Aspects:

The proposed system considers practical aspects, such as usability and satisfaction, suggesting improvements in user experience compared to traditional systems.

4. Data Utilization:

The use of a real-world dataset is a distinctive feature of the proposed system, aiming to enhance the relevance and diversity of recommendations.

5. Decision-Making Model:

Decision tree C4.5 is employed for recommendations, indicating a departure from traditional models and potentially providing more personalized suggestions aligned with tourists' preferences

ADVANTAGES:

1. Human-Centric Approach: The proposed system places a strong emphasis on understanding tourists' decision-making, potentially resulting in more intuitive and personalized recommendations.

2. Feature Selection:

The introduction of a two-step feature selection method is a novel approach to reduce input dimensions, contributing to improved system efficiency.

3. Real-World Data: The use of real-world data sets the proposed system apart, potentially addressing the limitations associated with artificial or limited datasets in existing systems.

4. Decision Tree C4.5:

The use of C4.5 suggests a departure from conventional recommendation algorithms, potentially offering more transparent and interpretable decision-making.

5. IMPLEMENTATION

1) User Interface (UI)

The User Interface (UI) serves as the graphical front-end of the application, offering users a visually appealing and intuitive platform to interact with. It enables users to input data, navigate through different features and functionalities, and view results in a comprehensible format. The UI plays a crucial role in providing a seamless and user- friendly experience, ensuring that users can easily access and utilize the application's capabilities without encountering complexities or difficulties.

2) Server

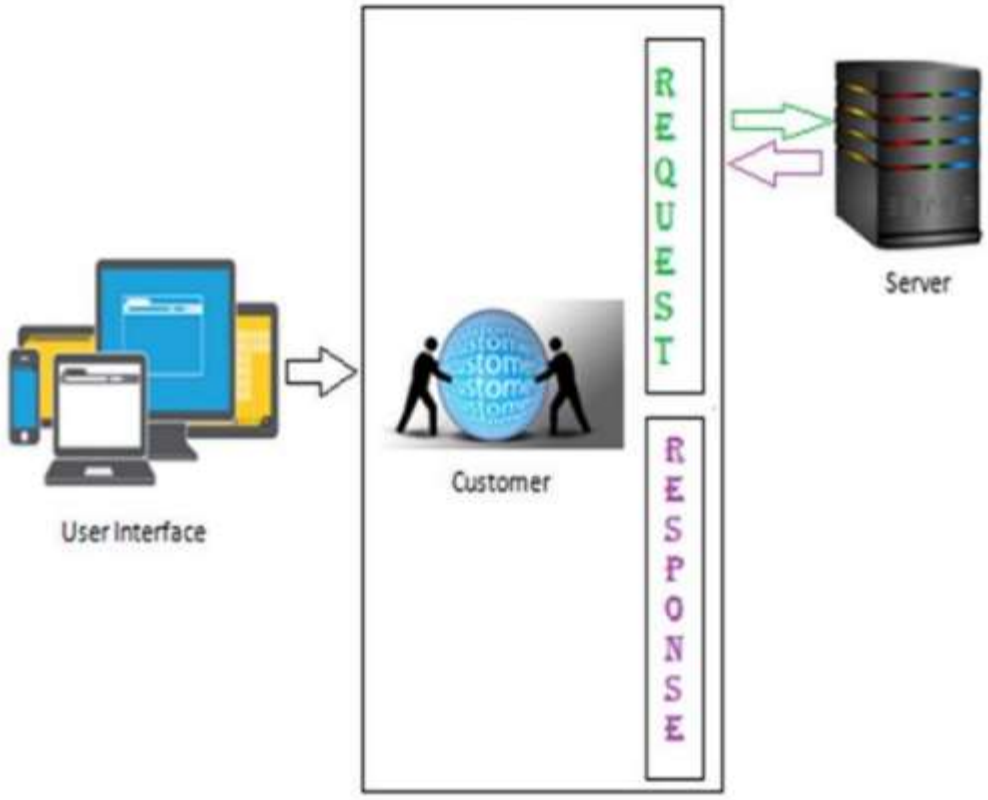
The Server functions as the backbone of the application , handling various backend operations and facilitating communication between different components of the system . It is responsible for processing user requests, executing algorithms, managing data storage, and handling interactions with databases or external systems . The Server ensures the smooth operation of the application by efficiently managing resources, coordinating tasks, and delivering results back to the User Interface for presentation to the user.

3) Customer

The Customer module facilitates dataset uploading , preprocessing , feature selection , And model generation, including decision tree modeling It employs a structured survey Methodology to

comprehensively capture factors influencing destination preferences, encompassing trip specifics , tourist demographics , motivations , and socioeconomic backgrounds . This robust approach enhances the application's capacity to deliver tailored tourists recommendation , optimizing user satisfaction and engagement.

6. SYSTEM ARCHITECTURE



7. EXPECTED REUSLTS

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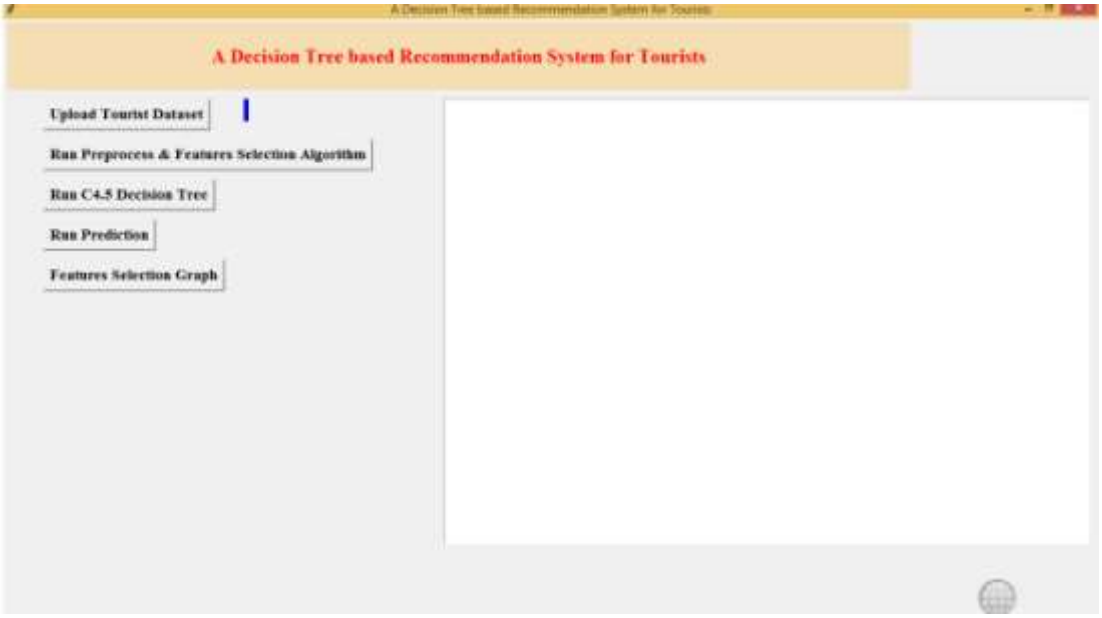
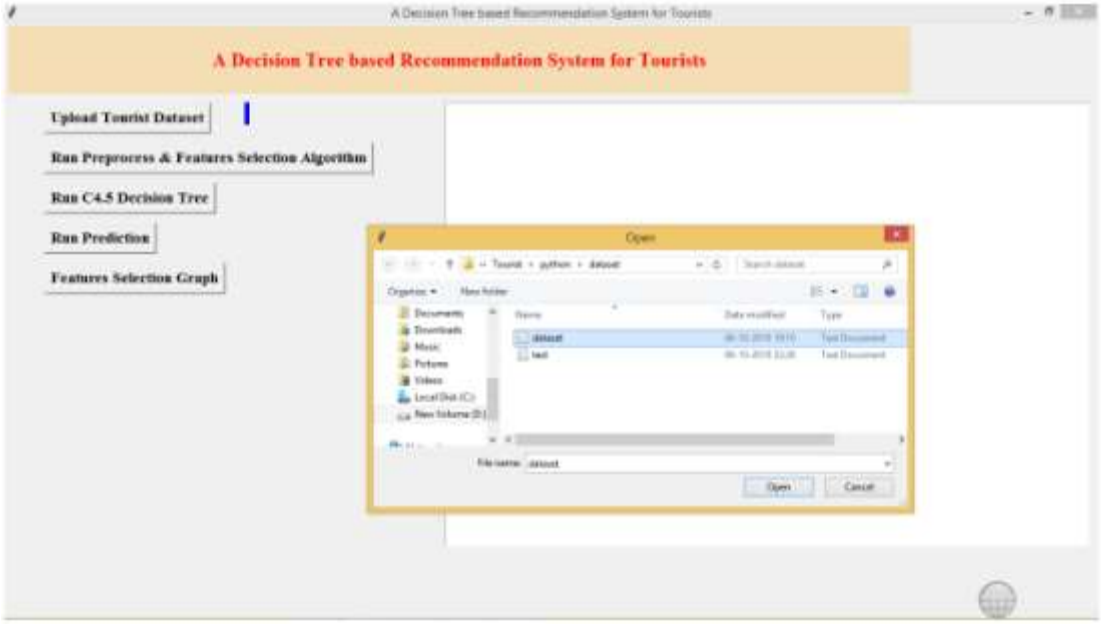


In above screen click on 'Upload Tourist Dataset' button and upload dataset file.



After file upload will get below screen with all dataset details.

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In above screen all users past experience dataset loaded and total 12 attributes are there in the dataset. Now click on 'Run Preprocess & Feature Selection Algorithm' button to remove empty values and reduce attributes size**.**

In above screen after applying MRMR features size reduces to 3 and only those attributes will be used whose column is TRUE and FALSE column will be ignore. Now click on 'Generate C4.5 Decision Tree Model' to build model.

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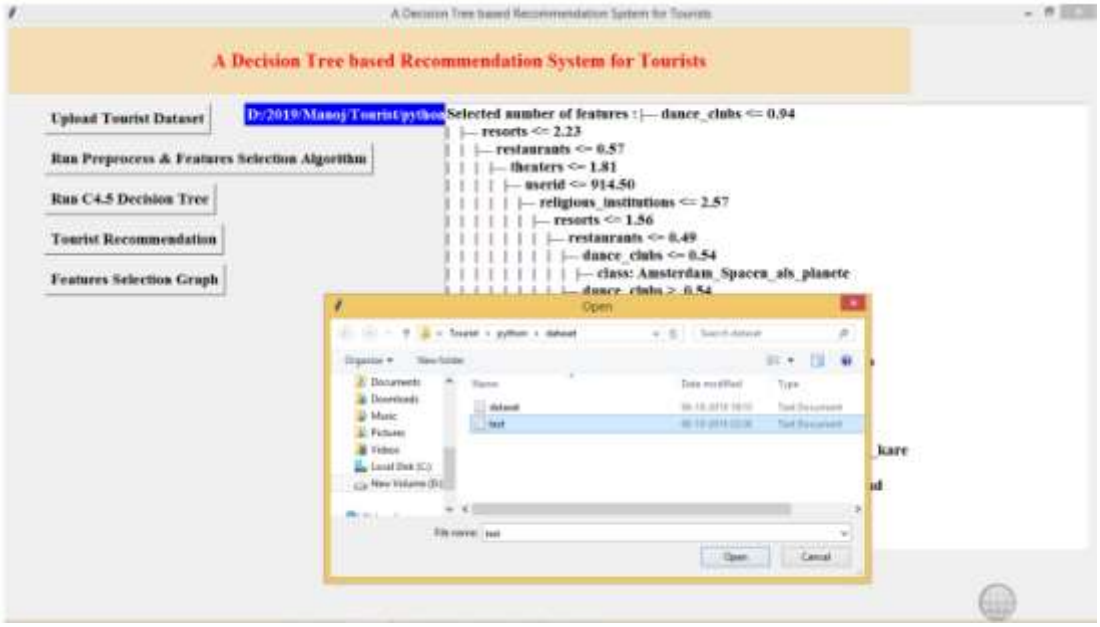
In above screen we can see using IF and ELSE statement decision tree has generated model. If > it will choose some decision if < it will choose some other decision. Now click on 'Tourist Recommendation' button to upload test file with no location name and application will predict it.



In above screen i am uploading test file now click open to get predicted or recommended location. In test file location name is not there application will give.

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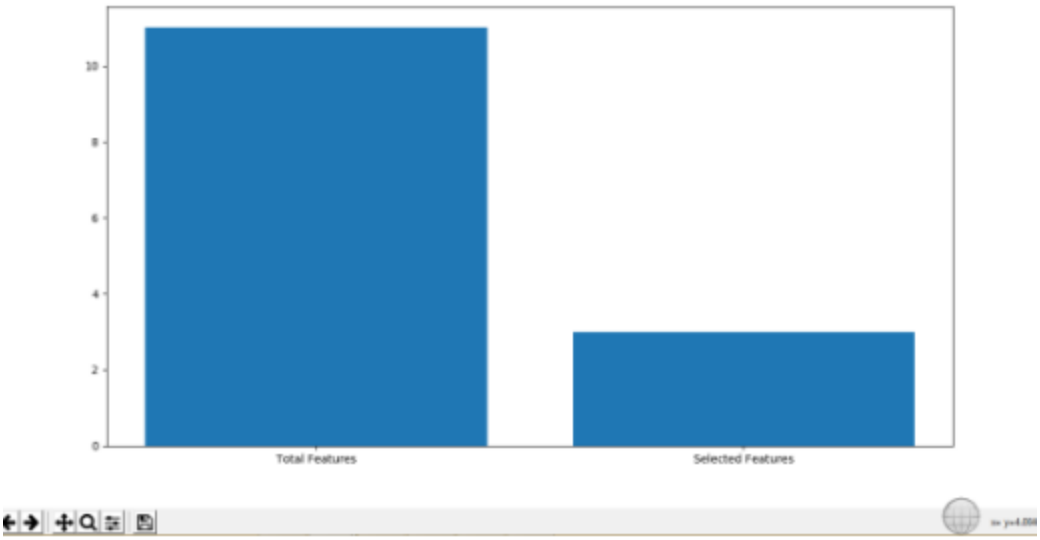
In above screen after uploading test data we can see all values are there in test data but it not has location name and base on test values application predicted or recommend location name.



In above graph x-axis contains total features and MRMR selected features and y-axis represents count of features and in above graph we can see after applying MRMR technique features size reduces to 3.

8.CONCLUSION

A decision tree based tourist recommendation system has been presented in attempt of solving the current challenge of the destination TRS. The data set has been decomposed into two sub data sets using relevant tourism domain knowledge. This was done to increase classification accuracy rate and to reduce the complexity of the decision tree. The optimal decision trees from NMIFS with the highest accuracy rate and simplicity (i.e. less number of leaf and tree size) have been constructed for destination choice. The decision rules from decision trees were extracted. It can be seen that NMIFS is the optimum method because it uses fewer number of feature than MRMR for both of the data sets. Finally, the experimental results confirm applicable of the proposed a TRS. The proposed TRS satisfies the tourists' requirements who plan to visit or during their visit the city of Chiang Mai.

9. REFERENCES

[1] J.Chiverton, "Helmet Presence Classification with Motorcycle Detection And Tracking",IET Intelligent Transport Systems,Vol. 6, Issue 3, pp. 259–269, March 2012.

[2] Rattapoom Waranusast, Nannaphat Bundon, Vasan Timtong and Chainarong Tangnoi, "Machine Vision techniques for Motorcycle Safety Helmet Detection", 28th International Conference on Image and Vision Computing New Zealand, pp 35-40, IVCNZ 2013.

[3] Narasimha Chary Ch, CH. GVN Prasad. Human Deep Skin Surface Vibration Frequency Detection from CT and DT Signals Using Genetic Algorithms. International Journal of Algorithms Design and Analysis Review. 2024; 2(1): 1–8p.

[4] Romuere Silva, "Helmet Detection on Motorcyclists Using Image Descriptors and Classifiers", 27th SIBGRAPI Conference on Graphics, Patterns and Images.IEEE, 2014

[5] R. Shobarani, R. Sharmila, M. N. Kathiravan, A. A. Pandian, C. Narasimha Chary and K. Vigneshwaran, "Melanoma Malignancy Prognosis Using Deep Transfer Learning," *2023 International Conference on Artificial Intelligence and Applications (ICAIA) Alliance Technology Conference (ATCON-1)*, Bangalore, India, 2023, pp. 1-6, doi: 10.1109/ICAIA57370.2023.10169528.

[6] Abu H. M. Rubaiyat, Tanjin T. Toma, Masoumeh Kalantari-Khandani, "Automatic Detection of

Helmet Uses for Construction Safety", IEEE/WIC/ACM International Conference on Web Intelligence Workshops(WIW).IEEE, 2016.

[7] CHOLLETI, N., & HIRWARKAR, T. (2020). BIOMEDICAL DATA ANALYSIS IN PREDICTING AND IDENTIFICATION CANCER DISEASE USING DUO-MINING. *Advances in Mathematics: Scientific Journal*, *9*, 3487-3495.

[8] Kunal Dahiya, Dinesh Singh, C. Krishna Mohan, "Automatic Detection of Bike-riders without Helmet using Surveillance Videos in Real-time", International joint conference on neural network(IJCNN). IEEE, 2016.

[9] Narasimha Chary, CH.GVN Prasad. Humanoid Ai Robot: A Member of Our Next the Generation Family. Journal of Advancements in Robotics. 2024; 11(1): 20–24p 5.