AI Applications in Tourism Research
A Summary of Recent Studies

Course: AI and Tourism – MIT-AI @ Gandaki University

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Overview

- Summarizes recent research papers applying AI in tourism
- Focus on objectives, methods, and data sources
- Papers span from 2016 to 2024
- Various AI techniques: ML, NLP, clustering, recommendation systems

Paper 1: Automatic Identification of Nepalese Tourism Related Tweets

Year	2022
Objectives/Task Solved	To automate the identification of Nepal tourism-related tweets from general social media noise
AI Model Used	Support Vector Machines (SVM) and Naïve Bayes
Data Used	Twitter corpus containing 89,228 geotagged tweets in Nepal

Paper 2: Tourist experiences at overcrowded attractions

Year	2021
Objectives/Task Solved	To explore the perceptions and feelings of tourists when visiting overcrowded attractions
AI Model Used	Topic Modeling (LDA) and Sentiment Analysis
Data Used	Scraped text data from online reviews (TripAdvisor)

Paper 3: Spatial structures of tourism destinations

Year	2020
Objectives/Task Solved	To identify tourism hot spots as city centers/sub-centers and illustrate spatial interactions based on travel flows
AI Model Used	DBSCAN (Clustering) and SPADE algorithm (Sequential pattern mining)
Data Used	Mobile roaming datasets of 116,807 international travelers in three South Korean cities

Paper 4: Identifying Tourism Areas of Interest using VGI and NTL data

Year	2019
Objectives/Task Solved	To identify Tourism Areas of Interest (TAOI) while ensuring accessibility to essential infrastructure in urban and remote areas
AI Model Used	DBSCAN (Clustering)
Data Used	Geotagged tweets, OpenStreetMap (OSM) building footprints, and Nighttime Light (NTL) remote sensing data

Paper 5: Disaggregate Hotel Evaluation by using Diverse Aspects from User Reviews

Year	2019
Objectives/Task Solved	To discover coherent hotel aspects and estimate their relative weights to rank hotels based on latent user opinions
AI Model Used	LDA, word2vec, k-means, and Multiple Linear Regression
Data Used	OpinRank (259k reviews), TripAdvisor (23k reviews), and Yelp (50k reviews)

Paper 6: Discovering implicit activity preferences in travel itineraries

Year	2019
Objectives/Task Solved	To uncover underlying activity preferences of tourists by analyzing their travel itineraries
AI Model Used	Latent Dirichlet Allocation (LDA)
Data Used	Travel itinerary data

Paper 7: Utilizing UGC to describe Tourism Areas of Interest

Year	2019
Objectives/Task Solved	To extract semantically meaningful keywords that uniquely characterize specific Tourism Areas of Interest
AI Model Used	TF-IDF (Term Frequency-Inverse Document Frequency)
Data Used	Twitter (9,587 tweets) and Flickr (15,105 data points) in Kaski district, Nepal

Paper 8: Exploratory Study on Geotagged Tweets in Nepal

Year	2018
Objectives/Task Solved	To explore active user locations, spatial penetration, and hotspots of social media activities in a specific country
AI Model Used	Kernel Density Estimator and Local Moran Index (Clustering)
Data Used	32,084 geotagged tweets collected within Nepal over 7 months

Paper 9: Online Social Networks for Nepalese Tourism Promotion

Year	2016
Objectives/Task Solved	To investigate the features of major social networks for effective marketing and destination branding
AI Model Used	Content Analysis (Qualitative)
Data Used	Features and user statistics of Facebook and Twitter, and online presence of Nepalese tourism organizations

Paper 10: ML-Based Social Media Review Analysis for Tourist Spot Recommendation

Year	2024
Objectives/Task Solved	To develop a personalized tourist spot recommendation system by matching user queries with review probabilities
AI Model Used	SVM, Decision Tree (DT), and k-Nearest Neighbors (k-NN)
Data Used	27,151 reviews from Google, TripAdvisor, Instagram, and Tiktok for Pokhara, Nepal

Paper 11: Tourism mapping based on data mining and Apriori algorithm

Year	2023
Objectives/Task Solved	To mine the association relationships between tourism products and establish knowledge graphs for scientific regulation and market development
AI Model Used	Apriori algorithm, FP-Tree algorithm, and Deep Learning (BERT for preprocessing)
Data Used	6,284 WeChat public articles (OTA and UGC data) from 2018–2021

Paper 12: Hybrid Recommender System for Tourism in Iraq

Year	2023
Objectives/Task Solved	To improve recommendation accuracy and efficiency in data-scarce environments by providing personalized destination clusters tailored to user behavior
AI Model Used	Evolutionary Apriori and K-means clustering
Data Used	Augmented dataset of 10,000 records based on top-rated tourist sites in Iraq's 18 provinces

Key Observations

Common Data Sources
- Social media platforms (Twitter, Flickr, Instagram, Tiktok)
- Review platforms (TripAdvisor, Google, Yelp)
- Mobile data and geolocation information
- Volunteered Geographic Information (VGI)

Popular AI Techniques
- Clustering algorithms (DBSCAN, K-means)
- Topic Modeling (LDA)
- Association rule mining (Apriori)
- Traditional ML (SVM, Naïve Bayes, Decision Trees)

Geographical Focus
- Multiple studies focused on Nepal
- Studies from South Korea, Iraq, and global platforms

Conclusion

- AI techniques are widely applied in tourism research
- Focus on understanding tourist behavior and preferences
- Utilization of diverse data sources including social media
- Applications in recommendation systems, destination analysis, and marketing
- Increasing sophistication from simple classification to complex hybrid systems