

A New Approach to Personalized Recommendations for Cultural Creative Products in Tourism Cities: Insights and Future Directions

Jin Huang*

Department of Culture and Tourism, Zhejiang International Studies University, Hangzhou, China

ABSTRACT

This commentary examines the innovative recommendation method proposed in a recent study on cultural creative products in tourism cities, which leverages advanced user profiling techniques. By combining collaborative filtering, content-based methods and deep learning models, the study introduces a highly personalized system for recommending cultural creative products tailored to individual users in urban tourism settings. Here, we analyze the strengths of this approach, its potential to transform product engagement in tourism cities and future directions for improvement.

Keywords: Personalized recommendations; Cultural creative products; User profiling; BERT4Rec

INTRODUCTION

The study titled "Personalized recommendation method for cultural creative products in tourism cities based on user profiles" addresses an increasingly relevant topic in tourism research how to enhance visitor experiences by recommending culturally relevant products tailored to individual preferences. With the growing demand for authentic and immersive tourism experiences, personalized recommendation systems are essential for engaging diverse audiences and promoting cultural assets effectively.

The article highlights four major recommendation approaches: Collaborative Filtering (CF), Content-Based Recommendation (CBR), Convolutional Neural Networks (CNN) and BERT4Rec, a transformer-based model. The study demonstrates that BERT4Rec significantly outperforms traditional CF, CBR and CNN models, achieving an accuracy of 89% compared to CF's 70%, underscoring the value of deep learning methods, particularly transformer models, in processing complex user data to deliver highly relevant recommendations.

DESCRIPTION

Problem identification and analysis

The need for effective recommendation systems in cultural tourism stems from the diverse and subjective nature of tourists' interests. Traditional recommendation models, such as CF and CBR, face challenges in accurately capturing the cultural nuances and unique preferences of users visiting a tourism city. CF, which relies on user-item interaction data, can suffer from cold-start issues for new users or products. Meanwhile, CBR, which depends on item attributes, may lack cross-category insights due to its focus on content similarity.

CNNs, with their ability to identify patterns in visual or textual data, offer an improvement over CF and CBR by better capturing the features of cultural products. However, CNNs alone may struggle to interpret complex, context-specific preferences without additional contextual information. The BERT4Rec model addresses these limitations by leveraging a transformer architecture to understand sequential patterns in user behavior, leading to improved accuracy in predicting user interests within cultural contexts.

Correspondence to: Jin Huang, Department of Culture and Tourism, Zhejiang International Studies University, Hangzhou, China; E-mail: huangjin@zisu.edu.cn

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Overview of the proposed method

Unlike conventional methods, which typically rely on collaborative filtering or content-based recommendations in isolation, this approach integrates both along with BERT4Rec. BERT4Rec excels at capturing sequential data, making it effective at tracking user behaviors that change over time an essential feature for accurately recommending products in dynamic tourism environments.

The method's performance is notable, achieving an 89% recommendation accuracy, surpassing CF (70%), CBR (73%) and CNN (77%). This improvement is particularly significant for cultural creative products, which often require a nuanced understanding of user interests. The BERT4Rec component enhances the recommendation system by identifying implicit user preferences, especially for diverse and unique cultural products.

Advantages of the proposed model

Enhanced contextual awareness: BERT4Rec captures user behavior in a sequential, context-sensitive manner. For tourism cities, where visitors' interests may evolve throughout their stay, this ability to track and predict shifts in preference is crucial. For example, a visitor interested in historical sites one day might seek art exhibitions the next; the model can adapt to such shifts more readily than CF or CBR.

Improved handling of sparse data: By combining CF, CBR and deep learning, this approach addresses the data sparsity problem common in tourism cities, especially for new users or niche cultural products. BERT4Rec effectively bridges gaps in user data by drawing on sequential behavior patterns, making it suitable for diverse tourist populations.

Scalability for diverse product offerings: Cultural products in tourism cities are often heterogeneous, ranging from museum tickets to locally crafted souvenirs. The proposed model accommodates this variety by profiling user interests across

multiple dimensions, leading to more accurate and flexible recommendations.

Challenges and limitations

While this new approach shows promise, it also faces several challenges:

Data privacy concerns: Gathering detailed behavioral data raises questions around user privacy. As BERT4Rec requires extensive user information, developing protocols to protect data security and maintain user trust is essential.

Resource intensity: BERT4Rec requires significant computational resources, which may limit its applicability for smaller tourism cities or organizations with limited budgets.

Model interpretability: Deep learning models like BERT4Rec often function as "black boxes," meaning they lack transparency in how decisions are made. This could be a concern when trying to interpret or validate recommendation outputs.

CONCLUSION

The study's proposed recommendation method represents a major step forward for personalized recommendations in the domain of cultural creative products. By leveraging the power of BERT4Rec, this approach has the potential to enhance user engagement and satisfaction, making it easier for tourists to discover and purchase unique local products. Additionally, it provides a valuable tool for tourism cities aiming to promote their cultural offerings in a highly targeted manner.

Looking forward, further research could focus on improving the model's interpretability and computational efficiency, as well as exploring hybrid methods that incorporate other advanced AI techniques. With ongoing refinement, this recommendation system could become an essential component of tourism cities' digital strategies, fostering deeper cultural engagement and supporting the local economy.