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Visual Mining and Automated Classification of Social Media Tourism Images

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Abstract

In the era of visual communication, User-Generated Content (UGC) on social media has become a primary vehicle for tourists to construct destination images. However, tourism research has predominantly focused on text mining, leaving a gap in the systematic analysis of massive, unstructured image data. This study aims to bridge this gap by establishing an integrated visual mining framework to decode the visual structure of Taiwan's tourism imagery. Grounded in Destination Brand Love theory, this research analyzed 6,326 Instagram posts tagged with #ILOVETAIWAN. The methodology follows a three-stage process: (1) extracting semantic labels and color properties using Google Cloud Vision API; (2) identifying 12 visual themes through BERTopic modeling to overcome label sparsity; and (3) evaluating the performance of four algorithms (SVM, RF, XGBoost, and DNN) for automated classification, supplemented by color psychology analysis. The results indicate that SVM outperformed other models in handling high-dimensional sparse features, confirming its suitability for semantic label classification. This study validates the feasibility of automated visual mining and provides a robust methodological framework for analyzing unstructured big data. The findings offer data-driven visual marketing strategies for Destination Marketing Organizations (DMOs) to enhance brand love and destination positioning.

Keywords: Social Media Mining, Machine Learning, BERTopic, Destination Brand Love, Visual Marketing