

Abstract

Enjoying food while gathering and chatting casually has become a lifestyle, especially in big cities like Bandung. Bandung offers various culinary experiences, leading to the rapid growth of cafes there. Cafe is popular for socializing and enjoying food. The large number of cafes makes it hard for people to find one that matches their preferences, so a recommender system for cafes in Bandung is needed. Recommender systems typically use approaches such as Content-based Filtering (CB), Collaborative Filtering (CF), and Hybrid approaches. CF is popular due to its simplicity and effectiveness but struggles with data sparsity. Predicting recommendations based on a single-rating criterion is a challenge and often results in less personalized suggestions, as the suitability of recommended items can depend on multiple factors. Multi-Criteria Recommender Systems (MCRS) address this issue by enhancing recommendation accuracy and personalization using multiple criteria. Recent advancements in Deep Learning (DL) have shown success in various fields, including computer vision and text processing, and DL has been applied to recommender systems as well. Combining DL with Matrix Factorization in CF-based recommender systems, known as the DeepMF technique, has demonstrated higher performance potential. Therefore, we propose using the DeepMF method to develop a multi-criteria-based cafe recommender system in Bandung. This approach learns hidden factors in the user-item matrix interactions, identifying patterns and relationships between users and cafes. Our study finds that this method significantly outperforms single-criteria approaches, with notable differences in Mean Absolute Error (MAE) and Root Mean Square Error (RMSE) values of 0.1557 and 0.2351, respectively.

Keywords : recommender system, matrix factorization, cafe, multi-criteria recommender system, deep learning