

A Context Aware & Personalized Multiple Location Trip Planner Using Facebook Check-ins of a User

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Travel planning in a new city or a country is tedious and time consuming as the traveller has zero or minimal knowledge on which locations to visit in the new region. To overcome this problem many commercial solutions such as TripAdvisor and Google Trips, as well as research level solutions have been introduced. Even though these solutions are capable of reducing the information overload to the user, they do not perform any personalization in making travel recommendations. Therefore, the need for a recommendation system that is capable of extracting the user's personal travel preferences more accurately is still significant.

This paper introduces a novel methodology, which uses Facebook check-ins posted by a user to extract the personal travel preferences of the user. In contrast to the existing solutions that require the user to explicitly mention the type of places he/she would like to visit at a very abstract level such as restaurants, museums, hotels etc., this social media approach has the capability to reduce the decision making burden to the user. Moreover, this solution explores the applicability of personal profile similarities of users (similarities in age, gender, religion, education and hometown) that is derived using their Facebook profiles to further improve the recommendation process.

The approach introduced in this paper considers a sequence of location tagged posts on Facebook more commonly known as check-ins to represent the travel history of a user. Since the location tagged posts on Facebook do not have an explicit rating associated with it, a sentiment analysis is conducted to derive an implicit rating for each tagged location from the perspective of the relevant user. The sentiment analysis considers an aggregation of the status message, comments and emojis associated with the post to arrive at an overall sentiment for the location.

The solution is implemented as a mobile application, which allows the users to specify the location, date, and time around which the trip needs to be planned, the distance that can be travelled and the travel mode available to the user. Based on this input a set of candidate locations is extracted

from Google Places to suit the specified spatial and temporal context.

As the initial step of the recommendation module, a user-based collaborative filtering mechanism is implemented to rate each of the candidate locations from the perspective of the user in consideration. Based on the idea that users with similar travel histories will like similar places, new locations are recommended to the active user based on locations visited by top similar users in the system.

The novelty of the solution is further enhanced as it proves that by integrating the profile similarities between users to the recommendation process the accuracy of the module can be significantly improved. The drop in the popular error measurements Mean Absolute Error (MAE) and Root Mean Square Error (RMSE) due to the integration of the profile similarities is as shown in Fig 1 below.

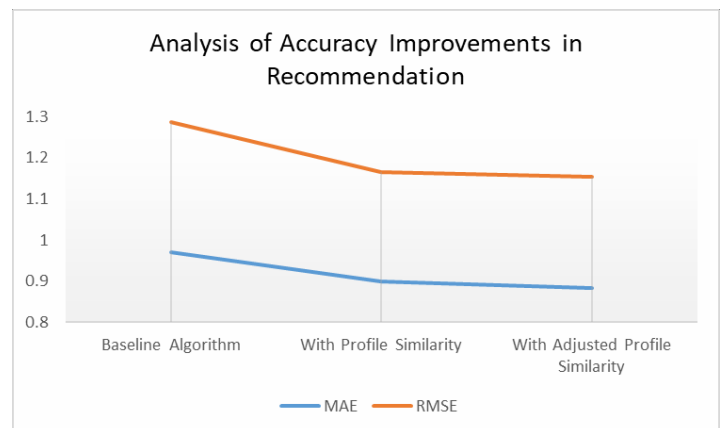


Fig. 1 Analysis of Accuracy Improvements in the Recommendation Module

In conclusion, this paper presents an original social media based approach to make context aware and personalized travel recommendations to users, implemented as a mobile application. The research is supported by experimental results that prove the approach undertaken is accurate which results in reduced error measurements. The solution provided is a robust approach to solving the personalization issue in travel recommendations and opens up many other avenues to the use of social media in tackling the above mentioned problem.