

# A Context-Aware Tourism Recommendation System

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It can be difficult to plan a tourist trip to an unknown city. One has to search through several guidebooks to decide what can be interesting to visit. One way to facilitate the planning of a trip is by using a context-based system. This system only provides recommendations that are interesting in the context in which the user is situated. Therefore, we have developed an algorithm that recommends tourism locations for the specific moment on which a user visits a city.

We used Flickr, a social media website where users can manage and share photos, to develop our recommendation system. Making the simplifying assumption that interesting places are those places that are often photographed, from georeferenced Flickr photos we compiled a list of the most interesting places within a given city (Points Of Interest, POIs). First, we considered the task of ranking all POIs within a city, according to their likelihood of being of interest to a user. In particular, we took into account the influence of the month of the year, the day of the week, and the hour of the day on the popularity of tourist attractions. Thereafter, we considered a second task, where recommendation is seen as an assignment problem rather than a ranking problem. In particular, we considered a scenario where a user has indicated  $n$  POIs she wishes to visit and  $n$  time slots during which she will be available. The problem then becomes to map each POI to a time slot, such that the POIs are visited in the best possible contexts.

We can conclude that our system performs significantly better than a non time-dependent system. Therefore, the time-dependent system could be used to plan a touristic visit to a city more easily or to improve existing recommendation systems. We note that the improvement over the baseline, which takes no account of the context of the user, is small (3 to 10%). In general, it seems that tourists tend to visit the most popular POIs at any time, i.e., there is a large number of POIs whose popularity is not time-dependent. Nonetheless, most cities have some POIs whose popularity does strongly depend on the hour, day, or month. In future work, we will investigate the effectiveness of the techniques introduced in this paper w.r.t. other context parameters, such as the weather.