An Emerging Conceptual Model for Curating Engaging Leisure Walking Recommendations

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Summary: *Providing routes to leisure walkers requires alternative recommendation scenarios to those used in tourism routing systems. In this paper, we present an emerging conceptual model of three scenarios for curating leisure walking route recommendations. Our recommendation scenarios consider the highest ranked similar walks, routes for new application users, and a progressively changing route recommendation scenario. Conceptual models for these scenarios are presented and the challenges in completing this research are considered. Feedback received on these early conceptual models will be used to further design a recommendation framework for curating engaging leisure walking experiences.*

Introduction

Leisure walking is an outdoor activity that can be undertaken for the purposes of getting outside, wellbeing, and exploring new places (Williams et al., 2021). Providing rich, contextual, and interesting walks for individuals is therefore a unique challenge that has been considered in previous literature. Watts & Bauer (2022) investigate the design and implementation of peaceful walks using a rating prediction tool that considers noise and natural features. Quercia et al. (2014) reports on walking route recommendations in the city, providing participants with routing algorithms that attempt to provide short, beautiful, quiet, and happy walks from crowdsourced perception data. Providing personalised recommendations at scale presents a problem in curating new routes, especially when considering research beyond that of moving between the most popular points of interest (POIs) (e.g., Gavalas et al., 2017), or outside of urban areas. We use the term curated to refer to the selection and organisation of POIs to create route experiences which meet the needs of leisure walkers.

The conceptual model presented in this paper is an emerging set of recommendation scenarios that will be further developed in the rest of our research project. The remainder of this paper presents the current recommendation scenarios, the challenges in relation to providing recommendations, and the expected outcomes and future work for the research.

Recommendation Scenarios

Based on the identified gap in applications and literature, we designed three initial conceptual models for a leisure walking route recommendation system. The system proposed is designed to take a hybrid approach to providing recommendations, making use of both content-based and collaborative filtering methods (Aggarwal, 2016). The emerging system design was

proposed in a way that multiple scenarios could make use of the same implicit and explicit input interaction (Ballatore & Bertolotto, 2015) to personalise application content. Figure 1 presents a high-level design diagram of this proposed model.

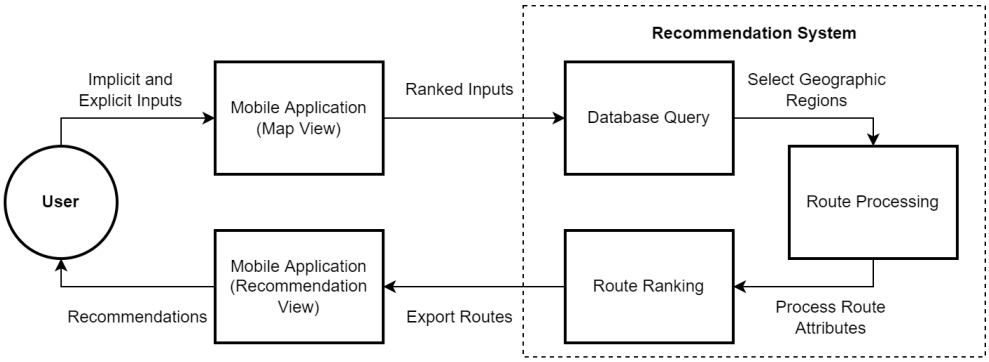

Fig. 1: A high-level overview of the conceptual model for the proposed recommendation system.

We propose that each recommendation scenario can also apply to two types of routing, defined as:

- **Dynamically Generated Routes:** Custom routes that are generated using existing attributes from datasets such as POIs or mobility traces, routing is then performed between each instance.
- **Pre-defined Routes:** Routes that have been curated or uploaded by users, this may be user generated content making use of ambient or volunteered geographic information.

Top Ranked Similar Routes

The first proposed scenario introduces the top-ranked similar walks to the application user. This proposed scenario uses ranked inputs from the user and stores these rankings in the system, when a new request is received the database is queried for similar route attributes (e.g., POIs, features). We propose that these routes are then ranked by the most popular in the selected geographic area and presented to the user.

Routes for New Users

The second scenario considers the display of routes to new application users, who may not have large amounts of information already in the system (e.g., the cold start problem). This scenario ranks known context (e.g., geolocation) and known responses to onboarding questions (e.g., where do you like walking?). The system will then query based upon this data and generate a distinct set of routes.

Progressive Route Strategies

The final proposed scenario presents a progressively changing selection of routes, enabling user selected strategy requirements to be supported through route recommendations. For example, a user may look to increase route complexity over a specified time period, meaning a plan is stored within the application and used to process and then present these recommendations.

Research Challenges

Some challenges exist in providing contextual and interesting route recommendations for leisure walkers, including:

Lack of Data. A lack of public data that exists in regards to natural or more subjective places along a walk make it difficult to curate leisure walking recommendations. Tourism-based research can use Foursquare POIs (e.g., Yang et al., 2015) to apply attributes to routes,

however, this approach is not possible in more rural areas due to an absence of identified physical locations.

Subjective Data. Data relating to leisure walking shares similar problems to that of other types of user generated content. It can be considered that user data required to apply context to routes needs to be captured through implicit or explicit interactions, requiring considerations from designers as to the privacy, reliability, and scalability of this data.

Expected Outcomes and Future Work

The emerging conceptual models presented are expected to be used within a framework for the curation of leisure walking route recommendations. We hope to understand how users engage with leisure walking routes through conducting a user study. With plans to investigate the use of platial information, a type of information relating to place as opposed to spatial representations (Westerholt et al., 2018). Our aim of this will be to investigate how platial information can be identified from meaningful interactions and used in the curation of new routes.

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