

The Path is the Reward: How can Social Networking be used in Pedestrian Navigation Systems to contribute to the pleasure of Urban Strolling?

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INTRODUCTION & MOTIVATION

Typical online map services, such as Google Maps, TomTom and others, were designed to deliver the most time, distance and fuel efficient route from point A to point B to car drivers. They have been extended to provide route description to pedestrians and cyclists using a similar algorithmic approach. These circumstances constitute a problem when it comes to the walking experience itself. Tourists, visitors to or inhabitants of a city like Paris, London or Vienna are often looking after a flaneur-esque experience (urban strolling) – they want to soak up the city and see hidden sights that are unique to the fabric of the city they are visiting. The question naturally arises how technology can be designed to better support this kind of urban exploration. With little attention to the walk itself, the user follows the generated path not knowing what he or she might miss out along the walk that gets degraded to a spatial necessity. At the same time social networks have become strongly location-based tools. They allow users to share not only their location [5] but also their opinion about certain places by using voting and commenting systems, which leads to the creation of a rich data set of geo-located user choices and crowd feedback sprawling over the cityscape.

In order to animate people for more walking within the urban landscape, we investigate if and how this data can be translated into the urban space to contribute to the walking experience. The investigations rely on the development of a wayfinder application – the Space Recommender System (SRS) – for the metropolitan area of London and other similar urban environments, which often have hidden back paths off the main roads. Locals often take these routes but visitors rarely – in contrast it is the visitor who is most likely to use standard mobile navigation devices (smartphones and tablets). Hence there is an opportunity for systems to be developed to support the idea of urban exploration informed by local knowledge.

RELATED WORK

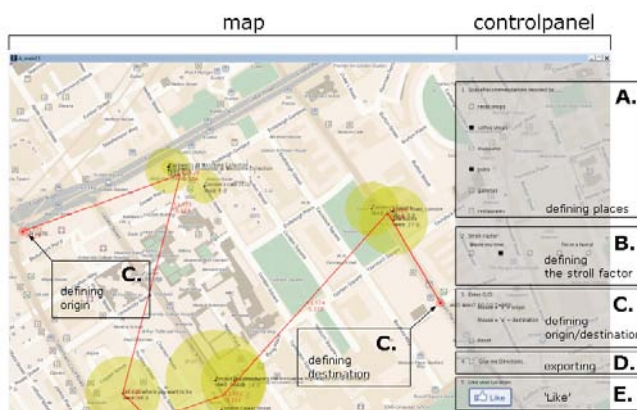
Mobile pedestrian navigation systems have been studied a lot within the (mobile) HCI community [4]. Various researchers have also explored how route descriptions can be enhanced for pedestrians and tourists. Raubal and Winter [7] have investigated how to enrich wayfinding instructions with local landmarks to support navigation at decision points. More recently Schöning combined with WikiEar [8] a routing service with a tourist guide system. Different Wikipedia article snippets were automated organized according to the narrative theory and executed as a location based audio tour. With GetLostBot [2,3] Kirman suggests a tool to break out of static movement patterns. Final outcome showed limitations of user's willingness to follow the suggestions generated by the system. Serendipitor (<http://serendipitor.net/>) is another system that generates random paths between two defined points. It adds tasks designed by celebrities for the user to complete along the way and must be seen therefore more as game rather than a navigation system. As further example, Walkit.com (<http://walkit.com/>) is a website that includes modeled air pollution data into the route finding process.

What is novel in our work is the strong integration and usage of existing data from virtual communities. Online social networks open up new opportunities for further research within that field. To our knowledge our work is novel in engaging pedestrians with their environment by using crowd-sourced feedback of facilities around them. Using Facebook's 'Like' data our research refers to the idea to incorporate social data in recommendation models [9]. It explores the combination of methods known from digital media, social media and a pedestrian navigation system in order to develop a new methodology for urban pedestrian navigation based on pleasure rather than transfer time.

SPACE RECOMMENDER SYSTEM

Our pre-studies (more extensive results will be presented during the workshop) showed that the participants saw a great potential of urban strolling and agreed on the general importance towards gaining pleasure while walking avoiding main roads and exploring interesting sights. They

agreed that social networks are often one of the main recommendation sources for locations and would take a longer detour into account to be able to walk along a pleasant route. Based on these findings, we have developed a desktop prototype using Processing (<http://processing.org/>) showing a map with the interactive UI components on the right side of the screen. The user can choose which types of places he is interested in visiting on his route, including retail shops, coffee shops, museums, pubs, galleries and restaurants. He can make the route longer or shorter by changing the number of route points that defines the output route. A user can select a start and endpoint by simply clicking the map (geo locating will be available on a future mobile application). The route is generated as self-organizing map. After route generation, waypoint coordinates are automatically exported to Google Maps in order to receive the routing relating to the physical environment. While walking, the user can also feed information back into the SRS by voting and commenting his geo location. The route description is then dynamically updated. Space Recommender System on Vimeo: <http://vimeo.com/54149010>



INITIAL EVALUATION

Thirty participants were asked to walk twice from a location to a defined destination using two different routes in London/St. Pancras during three overcast working days in summer 2012. Route A was generated from our SRS, whereas route B was suggested by Google Maps. After having finished both walks, the participants were asked to fill out a questionnaire to compare the two routes according to their personal experience. Questions relate to their general route preferences and their opinion about using the routes generated by the SRS every day.

RESULTS

When walking along the testing directions, route A (generated by SRS) was sensed and described by 23 participants as exciting while more than half of the participants found route B boring. Route B was also experienced by the majority of the participants as monotone, while a third found route A 'very diverse' and almost half of the participants still 'diverse'. More than half

experienced route A as calm, whereas route B was sensed as stressful and noise. In terms of pleasure more than 75% of participants were very 'highly pleased' with the walk on route A. Route B only can earn points in terms of distance and time efficiency, whereas 48% of the participants were 'pleased' and 42% being 'very pleased'. Nevertheless, 83% of participants think that the detour was worth doing route A, only 17% of users tend to see the longer route as a waste of time.

DISCUSSION AND FUTURE WORK

Evaluation show that using open source online voting data of social networks as input can open up possibilities to generate new experiences for the urban pedestrian. Therefore our methodology can act as animator for people's walking behavior. While positive results support the idea of such an approach, there are some unanswered questions that keep space for further research. One can question how far our approach supports this idea of the flaneur [1] by suggesting a route leading into dense areas of places of interest. Related projects [2, 3] point out the importance of understanding peoples behavior towards serendipity. The project picks up on those findings with the aim to engage people with the walking experience.

One limitation of the system is that it ran on a desktop to allow for ease of prototyping the general idea. While this is an obvious limitation we plan to further extend the SRS to mobile devices. In addition we want to further improve the route recommendations. The current prototype takes general 'Like' data as input. Recommendations are highly individual and differentiate from person to person therefore it is crucial to make this procedure more precise in terms of filtering, without navigating through a "Filter Bubble" [6].

FIELD ACTIVITY

The GeoHCI workshop at CHI 2013 is a great opportunity to test and evaluate our SRS as mobile application in the wild by professionals. The system will be available as Android application for workshop participants in order to explore the city of Paris with open source online voting data and to give us feedback on approach and usability. Besides feedback of randomly picked people off the streets as mentioned in our evaluation, feedback of professionals can bring up other important points for further research.

ABOUT THE MAIN AUTHOR

Martin Traunmueller is an architect and digital urbanist from Austria. He has studied Architecture in Vienna and holds a Master in Adaptive Architecture and Computation from the Bartlett. Currently he is working on his PhD at the ICRI Cities / UCL with focus on pedestrian navigation in urban environments and its relation to digital media.

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