ParkPal: Towards Ad-Hoc Route Planning for Runners

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Abstract. This position paper presents the preliminary design insights for ParkPal — an interactive system for supporting social running route planning in a city park. Based on our previous research efforts in augmenting the experiences of runners and ad-hoc multi-device interactive spaces, we propose a system composed of multiple station deployed in a city park. The stations contain tablet computers that offer on-the-go support for spontaneous route planning. The aim of the system is to support local running communities and promoting leisure and relaxation. We present our initial design and plans for future work with the system.

Keywords: multiple device environments, mobile interaction, information on the go, running, sports, touchless interaction

1 Motivation

The sport of running is a worldwide phenomenon with thousands deciding to join the runner community everyday. Runners can be easily seen on the streets of cities at almost any time during the day. Training, exertion and urban space create a unique interplay between runners and their surroundings where users seek to rapidly navigate streets and parks to fulfill their desire for an optimal workout. This position paper presents the conceptual design of ParkPal — an interactive system for improving the experiences of runners navigating through different routes in a city park.

As digital technologies pervade more and more spheres of our lives enhancing experiences for sports is important research theme. Currently, many forms of performance feedback can be obtained with devices available commercially. With the runner aware of their pace, total distance and total time, there is one more key variable that is especially important in urban spaces - the route.

Helping runners find interesting routes that match their training goals is a complex design task, especially if one realizes that everyday spaces carry a lot of extra information that affects the runner experience such as safety and traffic. MapMyRun [1] is a tool that provides users with the means to plan their routes before they leave for their training. No navigation tools during the run

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are widely used. Recently, McGookin and Brewster [7] presented RunNav - a system for supporting undirected navigation during runs that utilizes a smart watch and an abstract visualization to increase the spatial awareness of the runners. The system supports a community element by presenting information on runner-friendly areas from Foursquare.

While RunNav seems to perform well in supporting spontaneous decisions on where to run, we feel that the need for an extra watch and the ambiguous visualization cannot cater to many runners, e.g. those unwilling to give up on their regular pulse watch. An alternative solution would be to embed artifacts designed for runners within the outdoor space. López-Matencio et al. [6] attempted at deploying runner-specific infrastructure in the physical environment by designing a wireless sensor network for bodily measurements. Some races (e.g. the Midnight Run [2]) feature visual artifacts, with which the runners can interact. Still, augmenting the environment around the runner is a largely unexplored area and this motivates the design of ParkPal.

Several researchers [8] have shown that runners in urban parks and green environments have less physiological and physical stress levels compared to running in urban city centers. Thus, to further support runners in urban environments, we propose the design of novel tools that support runners throughout their running to foster a less stressful and more engaging experience.

2 The System

We build on our previous research on ad-hoc multi-device interactive space to create a system for facilitating the planning of routes for runners on the go. We propose a multi-device setup, which consists of a tablet and a smartphone. The tablet can display arbitrary information which can be browsed using the smartphone. To provide remote interaction, the position and orientation of the smartphone is tracked relative to the tablet. Additionally, we have defined several basic gestures to interact with the system. Information can be browsed by moving the smartphone in front of the tablet. A prototype has been build using a commercially available, high fidelity motion tracking system, which shows the core capabilities and advantages of this way of interaction. The devices are connected over wireless network to exchange information using TCP. The six degree of freedom positional information for each device is sent over the network by the motion tracking system, while the stations sends the respective information to the smartphone based on its relative position. This prototype already supports multiple smartphones and extending it to multiple tablets is straight forward. A future prototype could use LEAP motion controllers at each station to provide tracking. In order to grant ad-hoc connectivity to each station we refrain from using multiple wireless hotspots but distribute the information over mobile internet via the app. This way we only have to make sure, that only the correct device receives the information. This could be achieved by having the users log on at a station by using for example a QR code.

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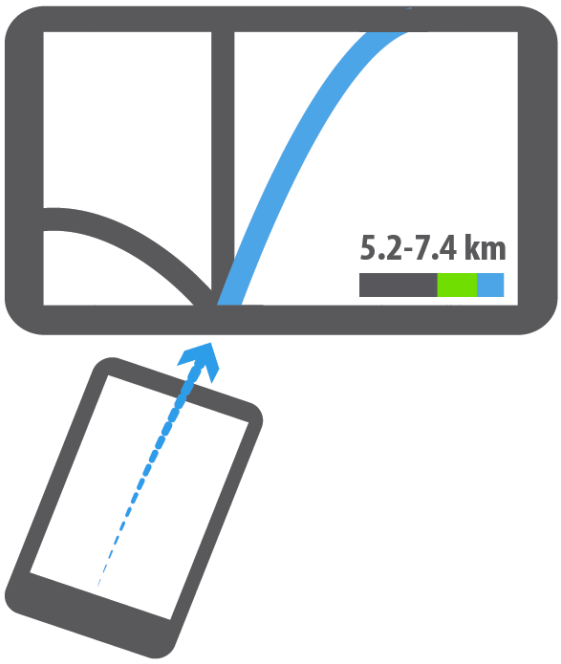

Fig. 1. Interaction with the system by pointing in a certain direction.

3 Design for Urban Running

The use of the Dynamic Duo system, described in Section 2 can be demonstrated in a scenario that facilitates runners in urban areas.

ParkPal is composed of several stations that are mounted with an interactive tablet, and each station is aware of the urban environment and all the runners connected in its area. The added benefit of using two devices is not obvious. However, decreased hand coordination is also a problem for tired runners that is ameliorated by the larger screen size in the stations. The interactive tablet is a tool that detects an approaching runner and adapts its options based on the runner's preferences. Based on the preferences of the approaching runner, live urban data and the current geolocation of the station, the tablet presents to the runner several options that aim to achieve a less stressful and more engaging running.

The proposed tool supports three main modules. The first is to allow the networking between the runner and the urban environment seamlessly, the second is to acquire real time data about the environment, and third to present information that supports planning out the run route and customize it to the runner's preferences.

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One requirement is of a supporting tool is to be able to connect to runners' mobile devices and obtain information about their preferences seamlessly. Once runners are identified, they can be presented with information that is relevant to their preferences. This includes, several possibilities for the next routes based on distances, terrain, noise, nature, and runners traffic. In addition, each station will show live data for individual runners approaching and interacting with the tablet as shown in Figure 2.

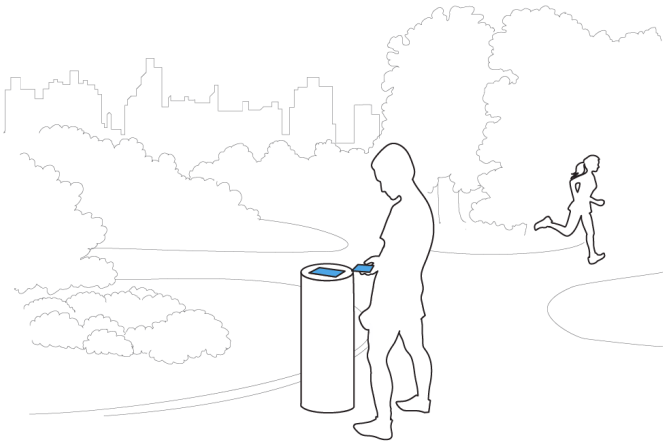

Fig. 2. Usage of the system during a run.

Sites and services such as MapMyRun [1], Runkeeper [3] and Google Maps [4] enable runners to use technology and interactive maps to plan their routes. These sites, however, mainly support the use case where the runner plans a whole run in advance.

We suggest that it may be an novel addition to support explorative running, where the runner can do informed ad hoc decisions en route. This enables the runner to reassess route decisions based on current information such as weather and mood, as well as explore and get to know a new city or area.

The station's function as a tangible shared resource, promoting a sense of community by holding the information for all runners and their routes, and by acting as physical reminders of the running community to runners and non-runners. Having these artifacts in the public space prompts curious non-users to learn about the solution and then possibly try it themselves.

Another advantage of physical, geolocated stations is that the runner need not consult his phone in order to see the stations, and can focus on the running. Furthermore, physical stations are necessarily spaced apart, and unlike smart phones do not tempt the runner to check their status constantly, thus promoting the main running activity. This is of importance, as our previous research shows that minimizing distractions is an important design factor [5].

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While the stations provides data on the area, the smart phone app holds information on the user. The user can setup preferences and tie it to social networks and the stations can then present information based on this information, as well as facilitate social running by leading runners towards friends, or letting users share their favorite routes with friends.

Another extension would be to support motivations for amateur runners, such as games and achievements. The stations could, for example, hold information on speed records and let users race unknown other runners.

4 Future Work

We are currently finalizing the conceptual design of the system. First prototypes will be developed based on our existing software repositories. We will use a user-centered design approach and runners will be involved at all stages of the design process. We have experience in runner outreach and good knowledge of frequented running spaces in Gothenburg and we intend to utilize them in the process. Our main goal is deployment in a major city park. This will be followed by an in-the-wild study where we will pursue both qualitative and quantitative feedback to evaluate the system. We will focus on the social aspects of ParkPal and investigate how runner communities can be supported by artifacts embedded in urban space.

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