

Virtual Spaces in Urban Landscapes

Locative Exhibitions on Mobile Devices

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Abstract. A concept of POIs renders the physical space in urban landscape as subject, which is being explored with a wide spectrum of digital media functionality as virtual spaces, hereby becoming accessible. The usage of mobile devices for locative exhibition spaces and location-based gaming is a new method to present information bound to physical locations.

Keywords. Virtual Spaces; Urban Landscape; Locative Exhibition; Mobile Device; Interactive Maps;

INTRODUCTION

Modern mobile devices like the new style smartphones or tablet PCs now fulfil most of the promises of electronic computation. Long-lasting issues like permanent networking, complete multi-medial content or ubiquitous computing are no longer worth a thought.

Instead the focus is on new applications, now shortened to apps, which utilise the in-built components of these versatile devices, like the compass, the gyroscope, the camera, the GPS-receiver, the networking capabilities, the touch-sensitive display and maybe more. New forms of software are emerging in order to avail the user of the abilities of modern cellular phones.

The application presented in the paper is one of them. It utilises urban landscapes as exhibition spaces for virtual objects displayed depending on locative information..

LOCATIVE EXHIBITIONS

A locative exhibition displays its artefacts not in a museum or other fixed locations but rather exhibits

the content on a mobile device, once its user has reached a certain point or area in space. Displaying content in digital form on mobile devices rather than as

physical presentation permits the visitor to crisscross a large area in order to combine the location with the exhibits.

The examples shown here are just a general global example with continental landmarks and one of our testing area

Fig. 1:
General Interface with Map,
POIs, and Annotations.



URBAN LANDSCAPE

The context of a city provides all the features of an urban landscape like buildings, streets, parks, squares and infrastructural places. It is very diverse and varicolored, but also flat. The real richness of urban landscapes unlocks only with knowledge. Related to the urban landscape becomes the individual context: individual memories, social relations and other aspects of a personal lifestyle are of importance, too.

Unfolding the various layer of cultural heritage, historical events, demographic diversity or simply commercial actions based on individual interests is one of the major based.

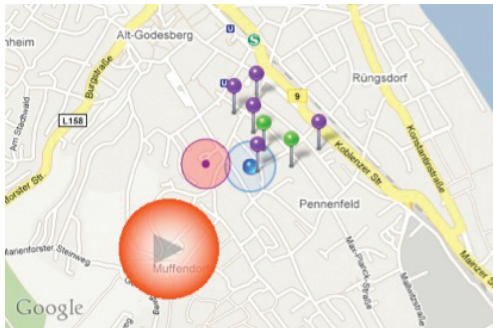
The sum of maps, different in style, content and age, every city can provided may be a simple example of these layers..

INTERFACE AND CONTROLS

The interpreter's main interface is laid out on a map (Fig. 1). Besides common interface technologies like panning or zooming markers are displayed at each POI (Point of Interests) as annotations. POIs are locations where a single object or a special piece of information is on display. Additional annotation markers picture the position of the visitant itself, may mark the home area, other visitants or moving objects for random events.

CONCEPT OF POIS

A POI is based on the concept of a circular area around a center defined in global coordinates. Both parameters are adjustable under the condition, that



the areas don't overlap (Fig. 2). If a visitant enters the area at a certain distance around the center, the POI is triggered and can be displayed. It is of paramount importance that a POI does not release its content automatically and thus enforces a physical action. There should always be an element of initiative from the user besides the automated triggering action. If a visitant confirms a POI, the various contents are on display until the visitant either reaches its informative end or leaves the POI. Then the releasing distance is active. This value should be slightly greater than the triggering distance to avoid gagging.

If the releasing distance equals the triggering distance, small movements or even the measuring inaccuracy of the device may trigger and release a POI at will. In addition to these defining functional values other values may be applied, like a lifespan, a visit count and more..

CONTENT OF POIS

There are two types of content, the exhibits and the notes taken from visitants. Outside the vicinity of a POI none of the data is accessible and can not processed. That space remains an informational void or whitespace.

Exhibits

The central piece of each POI is the object on display there. As result of the digital presentation different forms of renditions are made visible as image or written text, audible as music or as spoken text or as combined visible and audible content, and certainly as movie. Additional interactions can be required, rules can be set up and so forth.

Taking Notes

Visitants may take visual and/or acoustic notes at certain points. Depending on the defined rules there they may type a text of certain length, take a shot with the camera, record a movie or tape voice notes.

INTERACTION

Using physical spaces requires both interactions with the location, inhabitants, other participants

Fig. 2:
Triggered POI on Map

and maybe bystanders (Fig. 5). While all people there can use common social interactions like eye contact or verbal communication, the visitants of a POI can interact with each other by using their cell-phones, locally with Bluetooth and also globally using the inherent telephone and networking capabilities.

Communication

Some POIs may act like a phone booth, while others are a kind of meeting points. There is a wide range of possible pattern variations to be realised both in soft- and hardware,

A phone booth, as examples, would allow a contact from one defined POI to another regardless who is at one point. A direct POI-to-POI would act like a direct phone-line, or as a red-phone, while selecting other POIs upon answering would in essence simulate a normal phone grid.

Other forms might be a POI as broadcasting center relative to a broadcasting area if other users wish to, and so on.

In addition the medium is not bound to audible contents, as the examples might suggest. It can be both reduced to textual representations, like SMS or chat-applications, or enhanced as video and movie content. These techniques are still in under evaluation and more testing is required.

Archives

As every visitant of a POI can take note, these notes can be collected and made available to selected or all other users. The selection style can both depend on space and time, and probably achievements. The latter would lead directly to a game like application.

Similar to communications there are no real technical limitations to collect and present those notes.

DISCUSSION

Locative apps are concentrated on added informations to a specified area or region. Locations are evaluated against the location of a user, the value of the distance is important, not the absolute value of a location itself. The device is aware of the location

and its contextual representation. There is a wealth of apps out ranging from simple store finders to tagged realities, a form of AR (Augmented Reality) with two-dimensional overlays.

The only real exception worthwhile mentioning is geocaching. This is a form of gaming, where participants have to visit a certain location defined in coordinates, find a hidden box with a notebook and sign it. The physical presentation of the box and the note-book remains a problem, because of possible

Fig. 3:
Note written on a phone



casual finder. As type of a locative application geocaching is limited to hide and seek, and is not suitable for public spaces as in urban landscape.

The POI-based concept introduced here narrows the wider concepts of location aware applications to a strict definition of physical locations. Logically it only transforms the key-value coding model known from databases to a clean representation of locations as keys and their associated content as values. The more radical approach corresponds much with the reality than only 'aware' devices, as it acknowledge a place as real. The participant can decide on an appropriate action on its device only if said device has reached a place,

CONCLUSION

Conceptual strictly dividing the technical functionality into the spatial parameters like ranges, geo-location, rules etc. and the content as the very substance of an exhibit based the idea of POIs looks promising. Adding game-style interactions or narrative elements becomes an easy task. The enormous potential of interactivity unleashed by setting only a few spatial parameter in tandem with capable hardware is by far more attractive than the simple presentation of objects in an exhibition. Not denying the physical representation of a location encompasses the digital informations and actions supplied by the devices and their natural equivalents. Individual characters and skills ask for flexible techniques to tune temporal and spatial parameter of people's spatial context in sync with their intended messages and concepts of spatial designs.

Most contemporary exhibition already feature digital presentations next to physical objects and the fact that there are other than real objects is in many cases not a concern. Still they are classical in the sense that they are centered on a site like a museum or gallery.

Utilizing an urban landscape as context of an locative exhibition dismantles all physical appearances and combines the individual perception of a physical environment with the media content provided on a mobile device.

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