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A Mobile Authoring Environment for User-Generated Location Aware Audio Tours

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Abstract

People are increasingly expecting online services to develop sharing place-related personal interests and their episodes. We designed a new kind of user-generated digital audio tours for not only guiding museums but also outdoor trips. These audio tours consist of recorded audios and dynamic maps synchronized with their routes. In addition, we developed a non-professional software tool named *maPodWalk Maker* for creating these audio tours with PCs. Its environment, however, has difficulty for creating audio tours with rich expressions related to the real world and distributing these audio tours to many online users. We think that its problem comes from a gap between recording media files outside and editing these with PCs. To solve the problem, we have developed a mobile software tool named *Mobile maPodWalk Caster (mMaPodCaster). mMaPodCaster* provides main three functions for an environment of creative activities with mobile devices. The functions are (1) recording audios, (2) synchronizing audios with maps and (3) distributing these audio tours to online users. In recording process, the device shows its routes and content's descriptions on a screen of a mobile device for creators' navigations and their expressions. *mMaPodCaster* utilizes mobile sensors such as a GPS receiver, an accelerometer and a digital compass for supporting automatically synchronizing its content and the real world. Users are able to record and edit users' photos with *mMaPodCaster*. This paper discusses the characteristics and significance of *mMaPodCaster* as an innovative mobile user environment for activating people's appreciation of the real-world with digital platial narrations and creation of place-synchronized streaming active media composed of audio, visual information and egocentric maps.

Keywords: spatial media; audio tour; user-generated content; mobile software

1. Introduction

Web-based broadcasting audio content is popular and called *Podcast*. Podcast consists of digital audio tracks which are recorded as a digital audio format such as MP3. Podcast is made with audio authoring software tools and distributed from not only companies but also personal creators. The listeners subscribe and listen to their intended Podcast with digital audio players, including mobile devices. The number of Podcast has increased on the Internet for commercial and non-commercial content. Many people think

Podcast is a new kind of radio broadcasting service for a personal journalism contrasted with the mass media based on commercialism.

Some Podcast is distributed for the purpose of navigating an area and telling place-related stories in the real world. The kind of Podcast is often called *PodWalk*. People download PodWalk for getting information and stories of the places where they are visiting and seeing through the Internet. The listeners have the way to carry and listen to their intended PodWalk in the real world.

PodWalk, however, has problems in users' spatial cognition and movements without visual content including maps but with only audio content. To solve the problem of users' spatial cognition, we invented a new concept *maPodWalk* as an extension of PodWalk which show users visual maps. maPodWalk displays the routes representing users' audio tours on maps. The listeners walk through the real tours while appreciating narration and maps provided from their mobile media players such as Apple Inc.'s iPhone.

2. Environment for User-generated Audio Tours: maPodWalk Maker

Some non-professional creators want to distribute their maPodWalk and share them over the Internet. There were no appropriate software tools to support their purposes and activities. We designed and implemented a desktop software tool named *maPodWalk Maker* for non-professional users to easily create maPodWalk. maPodWalk Maker provides users with opportunities to enjoy creating their own audio tours related to locations of the real world. We propose maPodWalk Maker as an authoring tool of user-generated audio tours with animated maps on mobile media players. In our experiment, our subjects created various maPodWalk and let other users use them when they find synchronization of both the audio and the map by walking on the route.

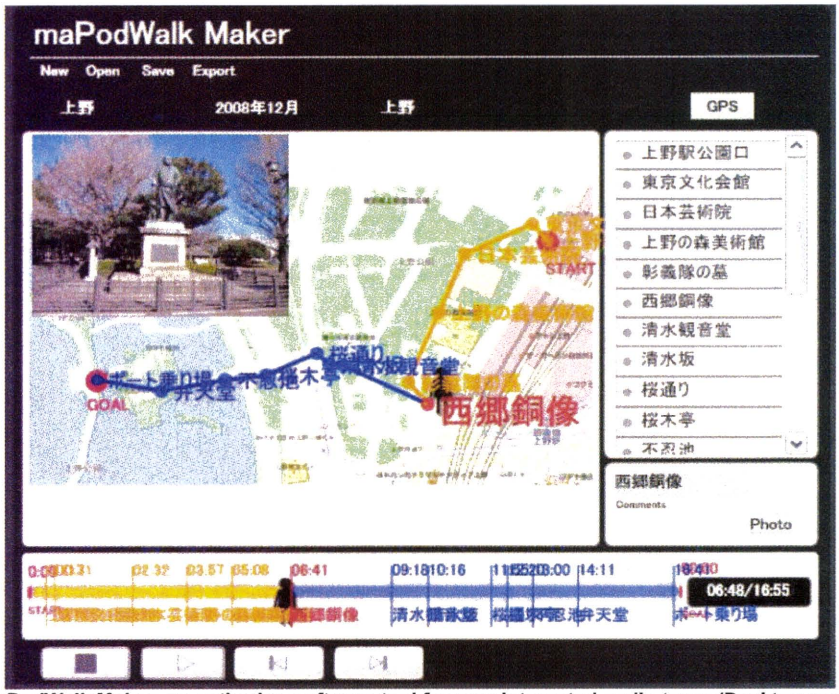

Fig 1. maPodWalk Maker: an authoring software tool for map integrated audio tours (Desktop version, 2008) [Map data: ZENRIN Co. Ltd.]

3. Problems of Creating Place-related Audio Tours with Desktop Environment

Creating digital content with a desktop environment has problems related to users' creative opportunities and activities. First, it is difficult for mobility creation of maPodWalk outside with PCs including notebook computers. If users have a mobile authoring tool of maPodWalk with mobile devices such as Apple Inc.'s iPhone, users can make and distribute their audio tours rapidly from the outside. With a desktop environment, the users, however, have to carry many devices such as a digital camera, a voice recorder and a GPS logger in recording speeches and taking photos for creating maPodWalk. In addition, it is necessary for users to import and combine these various digital files from each device. We think that its problem comes from a gap between recording digital files outside and editing these with PCs. To solve the problems, we have developed a mobile software tool named *mMaPodCaster*.

4. An Environment for Mobile Audio Tours: mMaPodCaster

We are implementing a mobile CMS tool of maPodWak called *mMaPodCaster (mobile maPodWalk Caster)* which runs on a mobile device. Our current version of mMaPodCaster is developed for Apple's iPhone. mMaPodCaster provides mobile authoring and user-interactive playing environment for audio tours with visual maps, that is, maPodWalk. It allows a user to record audio steams and compile audio tours from the audio streams, maps, texts and route information in a mobile environment. mMaPodCaster provides main three functions for an environment of creative activities with a mobile device., that is, (1) recording audios, (2) synchronizing audios with maps, and (3) distributing these audio tours to online users. In recording process, the device can display its routes and content's descriptions on a screen of a mobile device for creators' navigations and their expressions. Creators can take photos and integrated them with maPodWalk content with location information on mMaPodCaster.

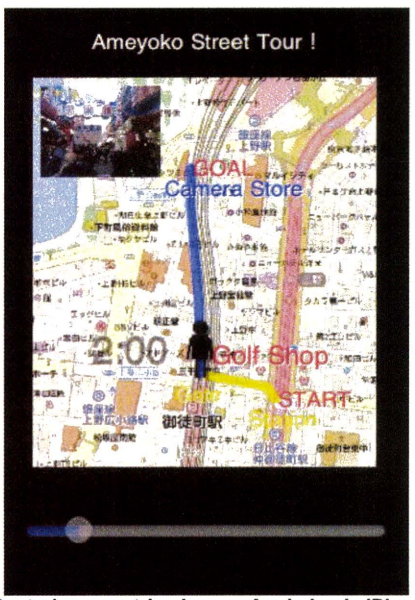

Fig 2: A snapshot of mMaPodCaster' geocentric view on Apple Inc.'s iPhone [Map data: ZENRIN Co. Ltd.]

When users listen to maPodWalk, they can change current time of an audio tour by tapping the both of the timeline and positions on the map. Also, users can listens to maPodWalk by downloading their intended maPodWalk from the Internet. Furthermore, users can select and view the maps from the geocentric map and egocentric map.

5. Methods for Creating of maPodWalk using mMaPodCaster

There are three main methods below for creating audio tours with mMaPodCaster.

Step 1: Recording an audio track

The users record their narrations along the tours' routes by a recording function of mMaPodCaster.

Step 2-a: Editing labels and photos of places

Users make labels of places and put them into the map with mMaPodCaster. These labels show creators' points of interests. Listeners can get spatial cognition from the both of audio stream and these labels. If users insert place-related photos into maPodWalk, user can import their photos by selecting and taking from mobile devices directly.

Step 2-b: Synchronizing positions of audio time and the map

Users synchronize the timeline of audio with places by placing labels on the map. For rapid creating maPodWalk outside, mMaPodCaster enables maPodWalk content to incorporate log data of mobile sensors such as a GPS receiver, an accelerometer and a digital compass for automatically synchronizing its content and the real world.

Step 3: Sharing maPodWalk

After the above creating process, mMaPodCaster automatically upload the maPodWalk content to the website for sharing many of maPodWalk content between online users.

6. Conclusion

Users used to edit and upload place-related content with desktop authoring tools such as Google Maps if users share the content. In addition, users had to carry many devices for creating the content such as a digital camera, a voice recorder and a GPS logger. With mMaPodCaster, users can rapid making and exchanging of place-related audio in a mobile environment. mMaPodCaster brings the characteristics and significance of mMaPodCaster as an innovative mobile user environment for activating people's appreciation of the real-world with digital narrations and creation of place-synchronized streaming active media composed of audio, visual information and egocentric maps.

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