



## **Audio Tours + Egocentric Maps on Mobile Music Players = maPodWalks**

—by Masatoshi Arikawa and Ken'ichi Tsuruoka

*Mobile music players are becoming increasingly popular, especially among young people who are carrying a large amount of digital music content in these small-sized digital audio devices. The mobile music players are also often used for listening to a variety of other types of audio content, such as audio books and other educational material, audio tours, and voice recordings of meetings and other events. Audio tours can be described as audio maps used to guide individuals through real spaces (see image above). Apart from facilitating audio access to content, mobile music players have also evolved into devices that display visual content, such as movies and photographs. Through the use of these displays, audio tours can be synchronized with maps, pictures, and texts into multi-modal interfaces which make it possible for users to more fully appreciate the real world. For these reasons, we use the term “mobile media players” in this article instead of mobile music players.*



The number of traditional audio tours for museums, towns, and other sightseeing spots has been limited because their production and distribution requires professional expertise and specialized equipment. The emergence of Podcasts is likely to change this situation. Podcasts are a new broadcasting format that uses the Internet. They allow people to create various kinds of audio tours for real spaces and distribute them to anyone who can access the Internet and download content to a mobile media player. Examples of audio tours that could be produced as Podcasts include tours for diners in Paris, for Japanese architects visiting Vienna, or for traditional comedy storytelling lovers on a visit to Osaka City (Figure 2).

Podcasts that guide individuals through the real world are called PodWalks. The number of free PodWalk files on the Internet is increasing. Individuals can easily download and store on their mobile media players a large number of PodWalk files using the Internet's podcasting capabilities.

These new communication technologies allow users to select and instantly listen to their favorite PodWalk files whenever and wherever they choose.

One of the most important characteristics of PodWalks is their capacity for including audio descriptions of the real world that can be used by walkers to synchronize the locations through which they pass with the spatial references given by the tour narrators. One of the significant factors in the evaluation of PodWalks is the degree to which an appropriate number of audio spatial references are incorporated into the audio content.

Tourists may find it burdensome to extract information from a printed medium while walking around in unfamiliar places. Audio tours reduce this burden because people can look for landmarks as they listen to their description and, often, they can listen to the narrative in their own language. The augmentation of Podcasts with audio enhances our options of accessing information. But before this happens, PodWalks must be created, down-



Figure 2. A popular web page with a free audio tour about the history of traditional Osaka comic storytelling for Japanese tourists provided by Osaka City, and Osaka Convention and Tourism Bureau. More than one hundred thousand audio tours for traveling in Osaka have been downloaded over a period of a year since the autumn of 2006. The bureau also provides a paid service for tourists using Apple Inc.'s iPod—200 yen or about US\$ 2 per use during daytime.

## PodWalks

loaded from the Internet, and stored in people's mobile media players.

Users subscribing to podcasting channels via RSS can automatically download PodWalks to their computers. Present software for podcasting also supports automatic synchronization of media files in portable media players, with the media files downloaded to computers as soon as users connect their players to the computers using wireless networks. With computer networks becoming truly ubiquitous, fast, cheap, and reliable, PodWalks that are accessible in real time from anywhere are fast becoming a reality and a truly useful enhancement to how we experience the world around us.

PodWalks create a unique appreciation of a place by synchronizing narrations with real-world places and, thus, provide walkers with interesting and exciting experiences that go beyond what can be offered by hard-copy maps.

Maps provide static information about static geographic objects. PodWalks link the sights, smells, and sounds of the place with expert commentary.

This commentary can describe virtually anything people do and what's happening around them. It could, for example, describe the activities of an artisan producing candies by hand using traditional methods. Or, it can be about moving objects—the falling leaves or birds in flight—and seasonal phenomena such as white flowers that bloom in the summer night. Also, information about an area's history or past events can be overlain onto the present real world.

Even if the PodWalks become dated, they may still be useful if the context of the PodWalks, the listeners, and the environment in which they are situated have characteristics similar to those when a given PodWalk was created. Older PodWalks often provide an opportunity for users to appreciate the differences between the past and the present place that they are walking through (Figure 3).

There are two ways of synchronizing the locations of narrators and listeners on the PodWalks. One is to control the locations of our bodies by stopping, moving faster, returning to previous locations, or slowing down. The other is to control the temporal position of the PodWalk audio content on the mobile media player by stopping, going forward, or rewinding the content.

If the quality of the spatial reference in the audio tours is high, users will easily recover from a wrong location, should they veer off the correct route. But if it is low, it might be difficult, or even impossible to synchronize the locations of the narrators with those of the listeners.

One of the simple and low-cost methods of increasing the quality of PodWalks is to enhance PodWalks with maps. Maps provide people with information about the correct



Figure 3. The narrator of the audio tour of Sensoji temple in Asakusa explains that covering the visitor's head with the smoke from the big burning incense pot is believed to make the visitor have good luck.

routes through visual cues and mental images of the routes. Audio tours without any other supplementary device make people feel anxious about losing their way unless they carefully listen to the audio tours. Furthermore, because audio tours generally provide people with information only about geographic objects at specific spatial and temporal points, it is not easy for people to picture the complete route or upcoming points of interest.

The static nature of paper maps often makes it difficult for users to find their location or identify current direction. Dynamically displayed maps incorporated into PodWalks give users with an egocentric view, i.e., a view where the icon

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Figure 4. maPodWalk (i.e., an audio tour synchronized with a map) on Apple Inc.'s iPod.

media spaces—the audio space, the graphic image (e.g., a map or photograph) space, and the itinerary (or place list) space—on the display screen. The users' natural actions of tagging the three media spaces with place labels are interpreted and translated into spatio-temporal descriptions that connect audio with a graphic image and itinerary content. This process links the temporally sequenced itinerary to the narrators' audio file, and the combined content is then linked to spatially referenced routes and points on the maps.

representing their current location is centered and highlighted on the map and the map is oriented in a heading-up fashion.

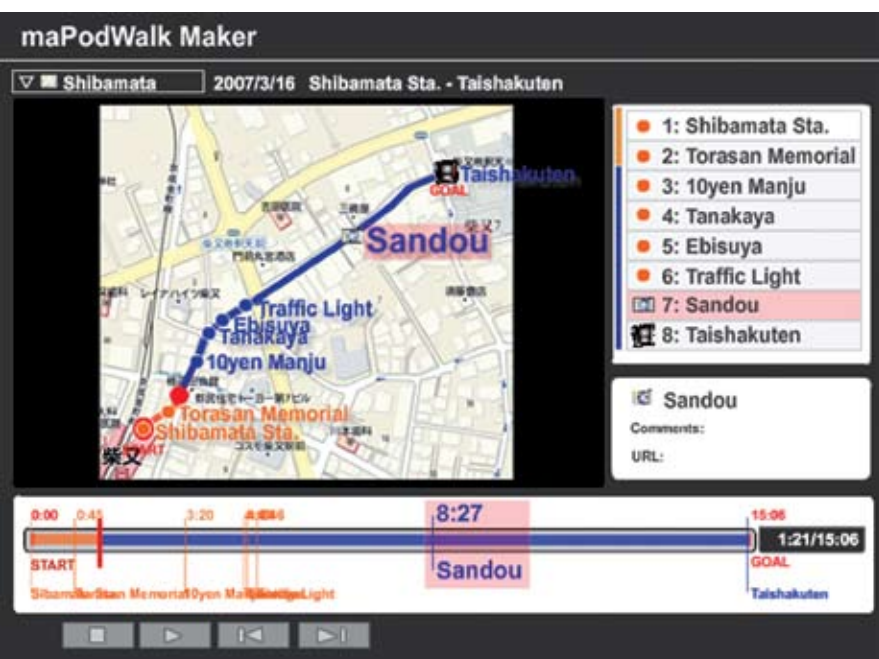
People generally do not want to carry several different types of materials (e.g., mobile media players, paper maps, and guide books) at the same time. Many of the older mobile media players have display screens mainly designed for displaying titles of music and pictures of album jackets. The newest mobile media players show movies and slide shows. When the screen is used to display dynamic and egocentric maps, mobile media players can provide dynamic, location-synchronized views with audio tours. We call PodWalks with synchronized maps maPodWalks (Figures 4 and 5).

Because it may be difficult for those who lack expertise in the production of digital movies and maps to create maPodWalk content that has dynamic maps properly synchronized with audio tour content, we have developed a new software tool called maPodWalk Maker (Figure 6).

The maPodWalk Maker is a GUI-based software tool that assists users as they attach tags of place labels to the control panels of the three



Figure 5. maPodWalks on Apple Inc.'s iTunes. Users to choose their favorite audio tours and maps by browsing a collection of music albums and book covers on mobile media players. [Map data from Zenrin Co. Ltd.]



If you want to attempt creating your own PodWalk and you think our experience can be of use, please get in touch. We think PodWalks are one of the most exciting information-enhancing opportunities the computer, the Internet, and the wireless world together have to offer.

Figure 6. Graphical User Interfaces of the maPodWalk Maker for end users wishing to create synchronized spatio-temporal descriptions of itinerary spaces. The ochre labels identify points that users have already traversed. The red circle icon identifies the current place which the narrator is describing. The blue labels are linked to points that users have not yet traversed. The blue label "Sandou" in larger font size was selected on the map space as an example, and the temporal extent of its description shows as a light-red transparent rectangle area on the audio space. Camera- and film-shaped icons on the synchronized map prompt users to view pictures and movies. [Map data from Zenrin Co. Ltd.]