MusicSpace: You "Play" The Music

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Figure 1: *(a) Meet friends through Meeting Mode. (b) Find destination through Navigation Mode.*

1   Introduction

Hearing is one of human's five senses. In our daily life, we usually guess where we are and the surrounding conditions not only by the visual feedbacks of the surrounded scene, but also by environmental sounds. For example, subway stations usually hint people the door closing by an urgent sound. In Taiwan, the garbage trucks usually broadcast one special song, and people can judge whether the car is coming. Similarly, we usually can recognize our familiar people only by hearing the sounds they generated without actually seeing them. For example, John usually bats basketball while entering the room. Hence, before he enters the room, the familiar sounds is heard, and can be recognized. Moreover, through the sense of hearing, people can only use their peripheral attention to quickly know where they are and what happens.

Music and physical space are seldom associated together. Only few work combined them. The G-series music player[1] takes the earth as the disk and the satellite as the needle. The most useful way is to combine the music with navigation. Warren *et al.* [2005] proposed Ontrack which is a system that navigating by music. Christoph [2007] proposed the roaring navigator which is a guiding system used in the zoo. Music can also be used socially. Pellarin *et al.* [2005] performed the project with their virtual instrument installed at a train station. While people walked into the predefined areas, the sounds ware generated, and the social communication might be built between strangers.

2   Implementation

The core design concept of MusicSpace is that there are full of music notes spreaded out in the space, and every object in the space can be represented as one music. In our design, we do not only encode music onto every landmark, but also encode music onto every people. Therefore, MusicSpace can not only help people to learn the environment, but also can let people use it as a social platform. We implemented our system based on the prevalent mobile technologies by retrieving the GPS information. We designed our

system into two levels, which are people-to-people and people-to-environment interactions.

For people-to-people interaction, we encode each individual as one featured song, and design two modes for this application, which are friend and social modes. The friend mode allows users recognizing their friends while they are nearby. The social mode allows them to meet a new friend in the space by checking the "playlist" which are composed of nearby strangers. For people-to-environment interaction, we encode each landmark or area as one featured song, and design two modes, which are environment and navigation modes. The environment mode helps the users to recognize where they are and the navigation mode is used for finding specific locations.

However, the key is what music the system should play, because there might be several landmarks nearby and moreover, landmarks might be in an area which also has its own represented music. Therefore, if there are several landmarks nearby, we play the sound of the nearest landmark louder. Besides, we also play the sounds of nearby landmarks by a modified Round Robin algorithm. According to the hierarchical songs, which means that broader area contains several small areas, we designed the playing algorithm according to user's moving speed. If the user moves with high speed, they should take an overview of the environment. Therefore, the system will play the broader area's representative song rather than the small areas' songs. However, by considering the most famous landmarks in the city, the weighted algorithm also takes the assigned degree-of-interest scores into account.

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