Gamified Navigation System: Enhancing Resident User Experience in City Exploration

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Background

A memorable city exploration experience requires some unexpected surprises. For pedestrians exploring in city blocks, ordinary route planning and navigation system cannot meet the need of interesting exploration and would even miss the possible surprises on the way.

In some multicultural cities, there are many street blocks with different characteristics and atmosphere, which may attract people with different interests to explore and discover some fascinating surprises. But there are not so many researches pay attention to how to promote resident's user experience during city exploration by gamified application. Moreover, few studies have incorporated gamification into navigation systems to support roaming and exploration activities.

In order to enhance resident user experience in city exploration, we designed a gamified exploratory navigation system. Our system would engage the user when they are close to a point of interest (POI) by proposing interactive activities and "conversing" with them.

System design

Our system integrated game design elements and gamification mechanism into real world interests-based navigation system to support city exploration. Thus, it could help pedestrian to explore during roaming in the street and increase immersion and participation through interaction. The mechanism of the system is illustrated in Figure2, which aimed to engage pedestrian in exploring more point of interests one by one.
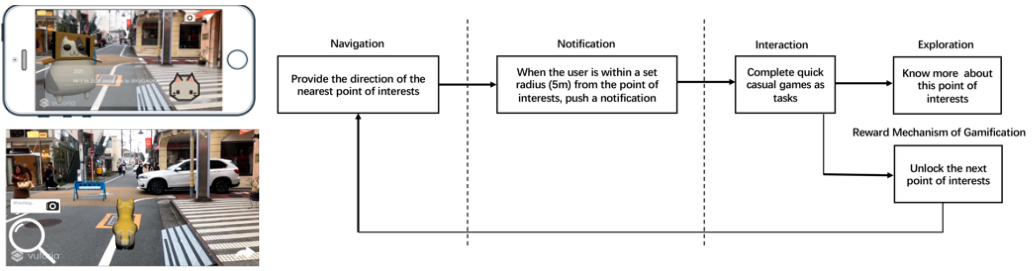

Figure 1: shows a conversation with virtual character assistant. When the pedestrian close to a point of interests, conversation.

Figure 2: The mechanism of the system is illustrated by a cycle consists of four stages, they are: navigation, notification, interaction and exploration.

When the pedestrian is within a set radius (5m) from the center of point of interests (a series of hotspots in destination based on real geographical coordinates (GPS)), system will send notification, which shown in Figure3. In **Interaction and Exploration stage**, user could complete some quick game tasks (like Figure4 show) followed by conversation and interaction with virtual character assistants (like a game NPC).

A gamified reward mechanism would engage pedestrian to trigger another navigation of point of interests around. For example, pedestrian will acquire points and check-in stamps by complete game tasks to achieve different level so as to unlock more information. about the surrounding.
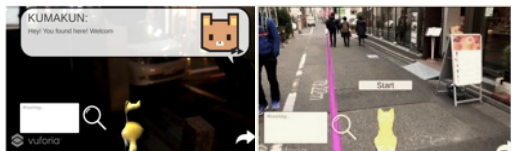

Figure 3: Game conversation is activated by virtual assistant (a virtual cat character).

Figure 4: A quick casual game for pedestrian learn more information about this location.

User study and Result

Five participants are invited to use our system to explore a real city block destination named JIYUGAOKA which is located in Tokyo, like the Figure5 right shown.
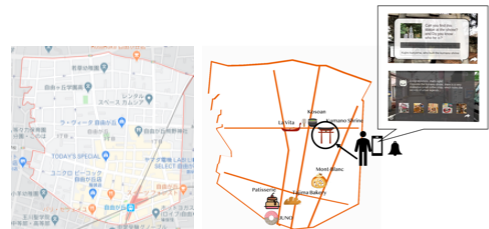

Figure5 Left: map capture of JIYUGAOKA from Google map; Right: Location-based hotspot trigger function.
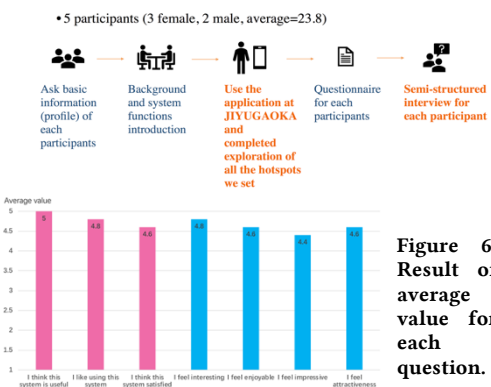
• 5 participants (3 female, 2 male, average=23.8)

Ask basic information (profile) of each participants → Background and system functions introduction → Use the application at JIYUGAOKA and completed exploration of all the hotspots we set → Questionnaire for each participants → Semi-structured interview for each participant

Figure 6: Result of average value for each question.

Future work

1) diversified exploratory navigation route;2) more intelligent function like context-aware ability which could be responded to the change of the environment;3) consider multimode interaction; 4) safety and privacy are also challenge in the future.5) recruit more real resident pedestrian with different age and without professional technology background to evaluate our system.

Comments and Founding

"I think this is a very interesting design. I was attracted by gamification mechanism, which let me engage in exploring point of interests one by one..."(P1)

"It is helpful for me to explore the interesting places by accident without the pre plan in advance."(P5)

"The proposal notification from the virtual character makes me feel accompany even if I explore the city blocks alone..."(P2)

・ help to generate a complete and continuous exploration memory.

・the interactive casual game tasks made participants feel more close connection with the real destination.

・drive the commercial prosperity of the city blocks (extend the interaction function to the reality business or with residents and stores).