Are you a smart citizen? Try City Balls, if you dare

Francisco Ramos
Institute of New Imaging Technologies
Espaitec 2 bld., 5th floor
Universitat Jaume I
Castellon, Spain
francisco.ramos@uji.es

Joaquin Pereira
Institute of New Imaging Technologies
Espaitec 2 bld., 5th floor
Universitat Jaume I
Castellon, Spain
joaquinpereirasilvestre@gmail.com

Abstract

Smart cities make use of information technologies to improve performance and quality of urban services, to decrease costs and to optimize resources, besides to involve citizens actively. However, many citizens do not know all the services and advantages that a smart city offers to them. In this work, we make use of a geogame to involve them in different cities and, by playing with real services, increase their knowledge about smart cities. *Keywords*: geogame; 3D; basemap; smart city; citizen; videogame

1 Introduction

In this paper, we present a description of a game design. Thus, it is structured as a game design document, where sections and subsections are related to several parts of the game.

2 Game Design

2.1 Overview

This game is scoped in popular cities around the world, probably well known by most of the potential players.

Our target players are people interested in knowing better a city, tourists or even casual players only interested in competing to other friends, within this particular atmosphere. In general, users play in different cities in the world, and services such as traffic conditions or information about bus stops, to name a few, will be connected to the corresponding level.

This game is mainly focused on cities, and game levels are bound to them. For example, you could have a group of levels named “New York”, with a particular level where the player must cross some checkpoints in the shortest time possible. In another level, the player should get to a place, as fast as possible, taking into account the current, and real, traffic conditions, and so forth.

Aiming at sustaining interest in the experience over time, for each level, leaderboards with best players are available. Moreover, players optionally can enable a multiplayer mode, so that they see other users playing, at the same time, in the same place (level).

2.2 Key Elements

Apart from the usual elements existing many games such as leaderboards, settings and other functionalities and assets. This game offers some unique features we proceed to explain.

As previously commented, one of the objectives of this game is to provide a way for the players to know places and services offered by a given city. Therefore, the different levels are connected to real data and services of the selected city, which gives a more immersive experience to the users as they observe realtime information while playing.

As an example, we could have a level where traffic conditions are connected to the game. In this level, the player should visit some checkpoints, in the shortest time possible. However, the traffic service for this city, at this time, informs us that some streets have slow traffic conditions, which has the same impact to the streets of the level. Therefore, it is important to accomplish the mission, but if you cross streets with slow traffic, you will be slowed down, as it occurs in real life.

3 Players: skills and motivations

This game is focused on players used to visit, or live, in urban environments. In particular, they should know what is a bike lane, bus stop or metro station, and usually know all the concepts related to transportation, traffic and general services offered in city. There are no more personal prerequisites for performing game actions.

Every group of levels, corresponding to a city, offers different missions, which are strictly related to city services. Thus, playing to other users in the same level, obtaining better scores than other opponents or interacting with data in realtime are key points that can persuade players to stay involved.

4 Geo-narrative and locomotion

In this game, users travel along several cities. These cities offer many services to them, but most of the people do not know how to effectively make use of those services and they waste time, effort and money due to their ignorance or inefficiency. Fortunately, now they are immersed into real scenarios, that is, real cities with real services and they test their knowledge, are compared to other users and learn more about a specific city and/or service.

Every player makes a trip to a city and must play all the levels of that city. Once all the levels are completed, he can activate another city and so forth.

Moreover, this game can be played in single or multiplayer mode. In single mode, a player just competes against other players' scores. In multiplayer mode, players can see each others and they compete in the same level.

In this game, levels are built in a city context, that is, first it is necessary to select a city. After that, we define different levels for that city. For example, we can create a group of levels called "New York", then we can have three levels:

- Level 1: players must cross some checkpoints in the shortest time possible.
- Level 2: players must arrive to a given place, but traffic conditions are in the level and they might modify the speed when traversing a "slow" street.
- Level 3: players must pick some items up and they can use metro stations to save time.

As commented before, this game is directly connected to geographic environments such as cities. It is important to underline that players can enable different modes of locomotion, which has implications in scores and leaderboards, among other things. It is possible to play some levels by selecting a mode of locomotion, but once game starts, at a given level, it cannot be changed until finishing the current level. Thus, locomotion modes available are: pedestrian, bike, car and bus, but in order to simplify the narrative we can suppose the pedestrian mode is enabled and never changes.

5 Geocontent

In this game, the different geographic environments, where levels are based on, are key as they are popular cities. Previous knowledge of them gives to the player an advantage (maybe a motivation as well), which is also difficult to measure in this context.

This game is specifically designed to exploit unique features of every city involved. Therefore, it is not relocatable to other cities or regions and geocontent is previously created and totally bound to a particular city.

Thus, for a given city, we define an extent to limit players' movements, Thus, in that context, the geocontent will consists of: 3D models of the buildings, a 2D basemap and, depending on the level, a service or specific information of the city, useful to build the level and set a mission and specific objectives.

6 Temporal balance

This game has been designed as a realtime game in two senses. On the one hand, it is multiplayer game, which implies to have a fluent communication system to avoid delays in updating locations in the game.

On the other hand, at certain levels, we provide realtime information, such as traffic conditions or weather by connecting to web services offered by public or private providers.

7 Technology

The technology needed to run the game will be Android and iOS smartphones. Moreover, intensive use of accelerometer is required since the balls, represented in blue in figure 1, moves along the accelerometer.

Another sensor, the GPS one, could be considered by adding a "manual" manner to play. In that case, balls would move along the GPS sensor disabling the accelerometer.

8 Geogame mechanics and rules

Essentially, the game here described is a competitive game. Players will start the game and a set or group of cities will appear.

8.1 General Rules

- Every group of levels has a city name and contains a set of levels.
- Every level is scoped in the city it belongs to.
- Levels have a specific order.
- It is not possible to jump among levels without having played at least once in previous ones.

8.2 Level Rules

- A player is represented as a ball in a particular color, movements are bound to the accelerometer sensor, see Figure 1.
- Levels always show 3D Buildings and a basemap, see Figure 2.
- There are no repeated levels in the game.
- Levels are defined by:
  - The city where it belongs.
  - The objective: cross checkpoints as fast as possible, best route avoiding traffic jams, use as many bike lanes as possible, best route by using bus lines and so on.
- Scores are calculated in seconds, the fastest a player is, the highest rank appears. In levels where services are time-dependant, leaderboards can be filtered by time intervals.

Figure 1: A multiplayer view within a basic prototype. Balls represent players.

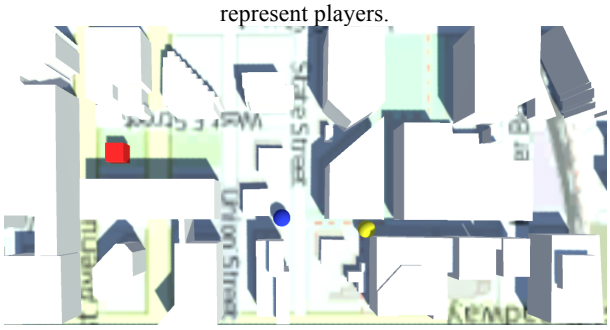

Figure 2: Simple 3D buildings of San Diego within a determined extent.