

# Journaling Urban Infrastructures through Mobile Games

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## ABSTRACT

In this paper, we discuss how a mobile, photo-based recreational game provides a platform for journaling the surrounding environment. We argue that it provides a fun and interactive package to elicit information on mundane experiences.

## Categories and Subject Descriptors

D.3.3 H5.2 [Information interfaces and presentation]: User Interfaces. - Graphical user interfaces.

## Keywords

Urban computing, recreation, social games, sustainability, mobile interfaces, citizen media, tagging, ubiquitous computing, situational impairment.

## 1. INTRODUCTION

The recent emergence of recording and authoring services in mobile devices has resulted in the democratization of media. With tools for uploading pictures, wikis, blog posts, videos, and so on, ad-hoc reporting of news is now a possibility. Consumers are producers and vice-versa. Not only do new media provide a voice for the audience, but also offer free access and the ability to concatenate multiple sources of information.

The current range of possibilities for citizen journalism includes camcorders, audio recorders, cameras, and mobile phones [1]. However, the primary platforms, at present, are Wikipedia [2], weblogs and video/photo-sharing websites, which constrain the user to high resolutions and large screen sizes. Conventionally, reporting in citizen journalism is carried out from sites of action. However, this makes one overlook the importance of mundane urban spaces, such as the grocery store, the neighbourhood park, or the gymnasium. These sites of use and overuse present a plethora of issues to be journaled, such as, the advertising of Paris Hilton on a Hollywood magazine stacked next to the billing counters, the hoarding of a new construction near a slide in the park, or the change in the Tuesday menu at work. We present an alternative approach to journal paths and sites of everyday use –

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*GreenSweeper*. Packaged as a recreational game, *GreenSweeper* makes use of a mobile device to journal objects *in-situ*. In the current implementation, *GreenSweeper* is designed to promote environmental awareness of surrounding areas. We will discuss its motivation and approach in the following sections.

## 2. MOTIVATION

Mundane is an integral part of our lives. Many a time, we find ourselves constrained by the nature of the setting in which we perform these rote acts, limited by the lack of human interaction and by bouts of waiting. Portable devices come in handy to fill these gaps of isolation and de-sensitized stimuli, such as walking the same route to the neighbourhood cafe or finding the same fruit-vendor setting up her stall. It is this mundaneness in infrastructure that we wish to highlight in our game.

Artefacts, animals, and people that we pass everyday are valuable and meaningful to our daily lives. Familiar Stranger [4] explores wearable devices for interacting with strangers that we share public spaces with. However, it is the lack of deconstruction and documentation experiences for these infrastructures that we wish to address. *GreenSweeper* presents a novel interaction technique to document these spaces, by using photographs, tags, and description as inputs for the game. By defamiliarizing the user with the familiarity and regularity of these urban spaces, we seek to provide a platform for reflection through gameplay [3].

## 3. APPROACH

*GreenSweeper* is modelled on the classic Minesweeper game. The game objective is to clear the minefield by avoiding detonation of a mine. *GreenSweeper* uses a picture of a surrounding artefact as input, taken from a mobile device. The primary interaction is by tagging the picture as green or non-green, by which we construct an experience of actively reflecting on the surrounding environment. The system initially chooses mines randomly, but thresholds mine possibilities based on user data from repeated sessions. At the end of each game, the system displays the picture history as well as other pictures with their associated descriptions from other game users. We explain the interaction in the Scenario section.

*GreenSweeper* runs on a mobile device and continuously pulls data from a server. Pictures shot by a user are posted on a public account in Flickr, which are then read by the server-side script. The meta-data is stored in a localized database. In addition to providing an incentive to win the game through a points system, we also aim at enabling a passive dialogue between various users. By making the pictures public on Flickr and displaying them at

the end of each game session, we provide a platform to exchange information pictorially.

Our motivation for making *GreenSweeper* pseudo-random for the first part is to make the game interesting by avoiding empty squares in the game grid. In addition, this also refines mine data so that they reflect the environmental landscape eventually. The machine-learning is also deliberate so that it allows contesting opinions, which might potentially provoke reflection.

Tagging the picture as green or non-green is equivalent to left-clicking on a mine or flagging it as a potential mine. There is a possibility that this will motivate the user to tag a picture as green when it is not, but since the size of each square is big enough to find other interesting objects, the user may find another artefact for the same tagging purpose. Both types of tags blur the boundaries between competition, avoidance, and exploration. By gathering text descriptions, we also hope to gain insight into why a particular artefact should be considered green or non-green.

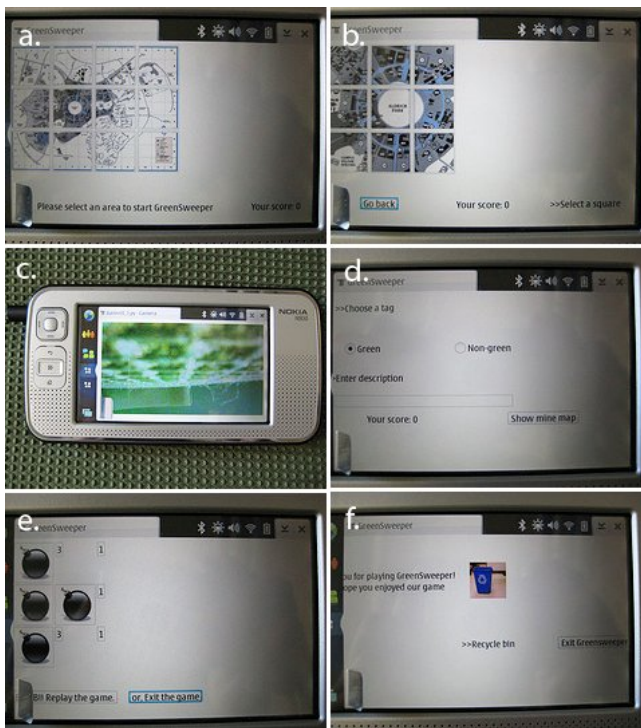


Figure 1 – Various stages of the GreenSweeper user interface.

### Scenario:

The user starts *GreenSweeper* on the mobile device. The welcome screen splashes instructions on how to play the game, which are also individually displayed in each state. Now, the server sends the mine map data for that particular level. Next, the user selects a square in the partitioned campus map and walks to the square (Fig 1.a). Then, the user selects another square within the second level (Fig 1.b). Now, the user opens the device camera and captures a picture of any artefact in vicinity within the square (Fig.1.c). The picture is tagged as green or non-green and a corresponding description is written (Fig.1.d). Next, the picture data is posted to Flickr and the mine map fetched from the server is displayed with a score. If there is a mine in the square, the user loses the game and could re-start the game (Fig 1.e). If there is no mine, then the

user could pick another square within the second level until he/she completes all squares. If a square was flagged, it could be unflagged in the next round. The option of exiting the game is also presented. In the end, a picture and its corresponding tag and description, shot by another user is displayed (Fig.1.f).

## 4. GREENSWEEPER AS A JOURNAL

For every advance in the game, the user has to shoot a picture and add a corresponding tag and description. By this, our aim is to allow the user to momentarily view the artefact through an analytical lens. The synthesis of other journal entries at the end of each session not only makes the user aware of the state of the environment as described by others, but also helps to reflect on the self's actions. The artefact acts as an object of reflection [5]. Therefore, *GreenSweeper* becomes a platform for creating, sharing, and simultaneously viewing user-generated content.

*GreenSweeper* also presents situational impairment in new light. By running as a mobile game, its portability allows the user to fight any spells of boredom. One can imagine *GreenSweeper* to be deployed in subways and airports, where the geographical and social landscape typically promotes spending time alone with very few options to kill time.

## 5. WORK-IN-PROGRESS

We are currently deploying *GreenSweeper* in the real world to gather real-time data to evaluate our approach and algorithm. Specifically, we want to uncover the awareness levels of the user and the nature of photos, descriptions, and tags. The relation between the population density and artefact density to the motivation of the user to complete the game will be evaluated. The ontology of tags used in various pictures and the usefulness of *GreenSweeper* as a journaling system also deems evaluation.

We discussed *GreenSweeper*, a novel journaling system that elicits information on artefacts and events through gameplay. By journaling the mundane, we broaden the scope of citizen media coverage to our day-to-day activities, turning game players into citizen journalists. *GreenSweeper* can be extended to any landscape that permits movement, such as coverage of concerts, the downtown grid, or the stadium. We envision the game to scale well to urban bikers as well as pedestrians. As the number of users increases, the algorithm becomes more reflective of the landscape and the possibilities for displaying relevant information increase.

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