

“Catch Me If You Can” – A Mobile P2P Application

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Abstract

This paper deals with the development of a mobile gaming application which is based on the real-world game known as “Scotland Yard”. We aim to introduce new rules in-order in-order to evoke greater interest and make the game more appealing to mobile users. The release version of the game could possibly bring in higher revenues for mobile application and service providers.

1. Introduction

The mobile version of the “Scotland-Yard” game is a real-world-physical, social, and wide area mobile entertainment application that is built upon the concepts of ubiquitous computing, tangible human-computer interaction, and content-delivery based mobile entertainment networks. The game has several novel aspects: Firstly, the players can immerse themselves in the role-play of the characters of the “cops” and “thief” as in the real physical world. Secondly, users enjoy unrestricted movement outdoor and indoor while maintaining their social contacts. Thirdly, Mobile Scotland Yard also explores novel tangible aspects of human physical movement and perception, both on the player’s environment and on the interaction with the digital world.

In this system the users are provided with an application that runs on cell phones and they interact both directly over the mobile network. Virtual fantasy and an immersive gaming experience, which have made the game popular, are incorporated using augmented reality techniques. The players also experience seamless transitions between real and virtual worlds.

2. Motivation

Entertainment with interactivity is becoming important as reflected in the growing popularity of online games. These computer games provide an un-rivaled richness of human interaction between players despite the geographical

separation that may be prevalent. Mobile Scotland Yard aims to merge the interactive aspects of networked gaming with the real physical world, while maintaining social contact in reality. The game has some aspects derived from on-going research work in the fields of ubiquitous gaming and mobile computing. The paper by R.L. Mandryk (Ubicomp 2001) examines the essential elements of free play, and multi-user social interaction. However it does not explore large-scale configuration where users walk around.

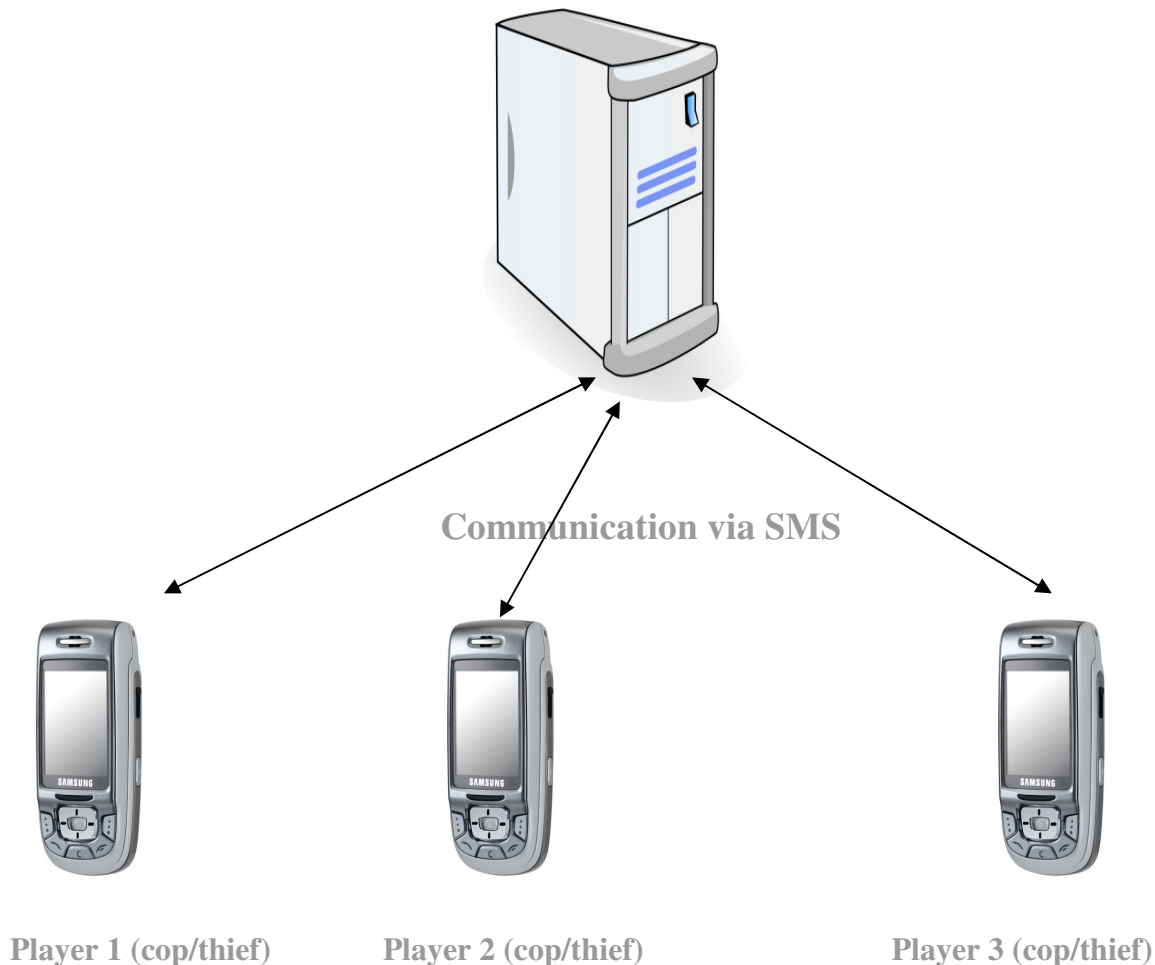
Nevertheless collaboration is carried out only in a small-scale and closed-up configuration

3. Algorithm

1. Players register to the game by sending “j<name>” as SMS to the messaging server. This is a JOIN message.
2. The server notifies all the players regarding their role (cop or a thief) and their starting region (The area where the game is to be played is divided into numbered regions). If the player is selected by the server as thief, the player will also be notified of the region where the first cue is kept.
3. The players send SMS to server of the format “m<region>” before actually making a move. (The cops and the thief don’t know where others are). This is MOVE message.
4. When the thief finds a cue, he sends an SMS “c<code>” to the server and at this point locations of all the players are revealed to every other player and the thief is notified where the next cue is.
5. The game ends when thief and a cop are found in the same region.

Pictorial representation:

Central Server that would process SMS from players



4. Rules of the game:

1. Once the game starts, players need to plan their next move and SMS that to the server of the format M<region> (M is for move) and this would be recorded by the server. The actual Scotland yard game requires you to take turns. But in our game you can simply send the server the SMS of your move and go ahead. No need to wait for your turn. You are always connected and playing without waiting for anyone. If you move without intimating the server, the server will carry a stale image of your location and the game may not run as intended by the players.
2. The thief knows the location of only the next cue. Each time he reports the cue code, the server apprises him of the next cue's location.
3. In the actual Scotland yard game, the thief knows where the cops are and cops know the mode of transportation used by the thief. To add more fun, we remove this mode of information flow, but allow that flow by some other means. Whenever the thief gets a cue, everyone in the game receives an SMS from the central server where all the players are. This information can then be used to make planned moves.
4. The thief gets caught if a cop and thief land up in the same region.

5. To make game more interesting, we place a caveat that a cop can move only to adjacent region (only one region at a time), but the thief is allowed to make double moves (two regions at a time) thrice in this game to save himself.
6. If a cop/thief try to cheat by making illegal moves (more than one move at a time), they would be caught by the server and would be thrown out of the game.

5. Future Scope:

If time permits, we intend to incorporate the following features:

Players' cell phone screen would display graphical representation of area and regions continuously to assist them in making next moves and would periodically display players' location (when the thief gets a cue) in red and green dots.

The onus of typing in SMS and sending it to server can be eliminated by building a J2ME application that will invoke an underlying messaging API when the scroll button is depressed on the cell phone. So players now have to just use the scroll button to make moves and the J2ME application will automatically send SMS's to intimate server of players move.

Plan of Action:

Week-1	Reading articles and papers on mobile gaming
Week-2	Determining requirement for successfully running the game.
Week-3	Designing our own algorithm to run the Scotland Yard game
Week-4,5,6	Implementing the server side code to continuously listen for SMS's.
Week-7	Testing the game for various conditions
Week-8	Demonstration