

Requirements Document

Geo-Seek: a GPS “hide-and-seek” app for Android.

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Introduction

Problem Statement

People enjoy using smartphones with others more than ever as the computing power of mobile devices has continued to rise. One of the most useful integrated features of modern smartphones is their GPS functionality, which allows phone providers to provide accurate date/time information for the device, broadcast emergency alerts to users in a risk area, navigation, and cellular telephony. Geo-Seek is a social game that harnesses GPS to enhance the traditional game of “Hide-and-Seek” on Android.

System Personnel

The developers on this project include Alexa LaMontagne, Andy Santiago, Bryan Bradley, and Jonathan Green. They are also responsible for the database design and the front-end product that serves as an interface with the user(s) playing in a session of Geo-Seek.

Operational Setting

The target platform for Geo-Seek is Android (API 19 KitKat).

Functional Requirements

Users (Host)

Android users can begin using Geo-Seek by downloading it from the Google Play Store. To start a game session, a player clicks “Start Game” which brings the first user to a form to 1) start an “Open Match”, which allow the user to invite Geo-Seek individually, a 2) “Play with Guild”, which sets up up a Geo-Seek match with a previously created team of Geo-Seek Users, or 3) “Create Guild” that builds a new Guild of Geo-Seek Users and invites these Users to a GameSession hosted by the User sending the invites. The initial user is referred to as the host. The host is also the “seeker” in Geo-Seek, the player responsible for finding all of his/her friends hidden across the map. The current location of the host upon picking options 1), 2), or 3) is saved as the Geo-Seek Playground, the arena of a Geo-Seek match.

Users (Invites)

Android users that are available to play Geo-Seek must have Geo-Seek installed on their device before playing in a session. A valid invitation game code can be received without having Geo-Seek installed, as game (Geo-Seek GameSession) codes are sent via SMS. Users that accept an invitation from a host are registered in a Geo-Seek GameSession and their initial coordinates are mapped for their host to seek. If the invited Users are members of a Guild, each member needs to accept the invitation to play before the Guild can start a match in a Playground. The maximum number of invitations a host can have in an “Open Match” is four, while a “Play with Guild” can be composed of up to six Geo-Seek Users.

Playground

A Geo-Seek Playground is generated at the start of a GameSession that determines the arena of a Geo-Seek game. If a User walks outside of the bounds of the arena all Users are notified. During a GameSession, the host of the match has the approximate

coordinates of the invites that he/she needs to “seek”. In order to tag another player, the seeker must take a photograph with their device camera to confirm that an invite, or “hider”, has been found. Photographs are stored in the Geo-Seek PhotoBank. A GameSession is suspended if 1) the seeker enters a “win” state when he/she has found all the hiders, or 2) the timer of the GameSession has expired.

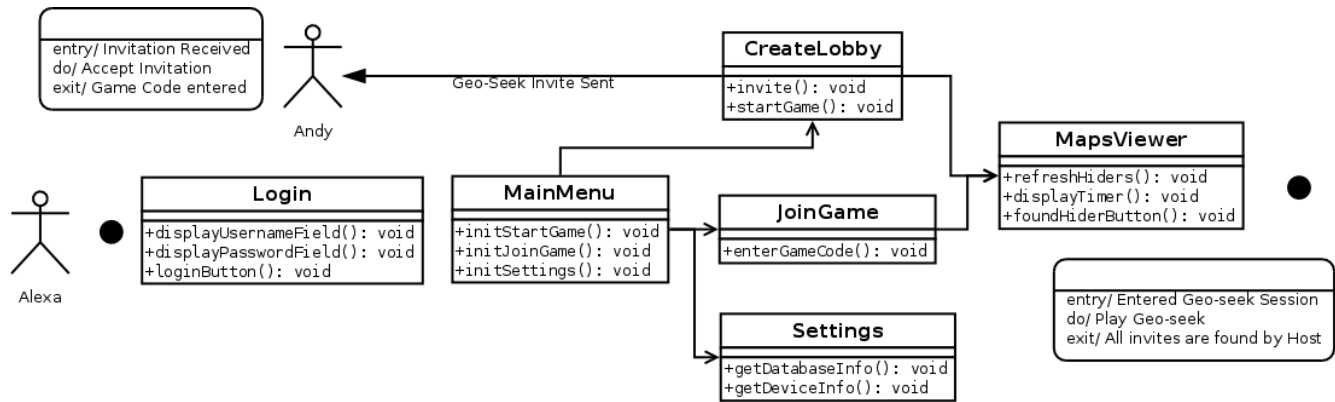


Figure 1. Typical Game Session of Geo-Seek. A user logs into Geo-Seek with his/her username/password in order to “host” a Geo-Seek session. The CreateLobby screen allows you to send a unique game code to your registered friends via SMS to join your game. Once a game has started, the host has a limited time to find all of the players he/she invited using the MapsViewer interface as an aid, a maps implementation powered by Google Maps. The winning condition is when the host as found all the hiders in the session. The lose condition is when the GameSession timer expires without the seeker finding all the hiders in the Playground.

OpenMatch

Initiated by Alexa LaMontagne;

Joined by Andy Santiago, Bryan Bradley, Jonathan Green

Flow of events

1. Alexa, who plays the dual-role of software developer and user, downloads Geo-Seek on the Google Play Store. In order to use Geo-Seek, she registers an account with a unique username and password.
 - The Geo-Seek database creates a tuple of Alexa’s account, using her phone number as a key.
2. Alexa navigates the Geo-Seek main menu and selects “Create New Game”. This brings her to a list screen that allows her to send invites to registered Geo-Seek users. She chooses “Open Match” to invite Geo-Seek users in the database.
 - The Geo-Seek client app queries the Geo-Seek database for users who are able to join a session and returns a list of available users to the CreateLobby activity.
3. Alexa sends invites to play Geo-Seek to Andy, Bryan, and Jonathan. Each invite joins the Geo-Seek GameSession hosted by Alexa by logging into GeoSeek with their username and password and selecting “Join Game”.

- Each invited user receives a unique game code (a randomized 4-character string) via SMS. The game code along with the registered users that accept the game invitation in “Join Game” are entered into the GameSession table.
- 4. Once invited users have joined the game with their game codes, Alexa is brought to the MapsViewer screen that gives her a Google Maps window with the approximate locations of Andy, Bryan, and Jonathan pinned on the map.
 - At the beginning of the game session, all current GPS coordinates of all player devices are sent to the database and queried by Alexa’s phone for the initial MapsViewer map view, giving her both 1) her current location, and 2) the approximate locations of the other players.
- 5. After a period of time had elapsed, Alexa found Bryan. By Alexa capturing a photograph of Bryan, Alexa has found one of three of the players and has to find the other two hiders to win Geo-Seek.
 - When Alexa takes a photograph of Bryan, the current geocoordinates are checked against the stored location on the Geo-Seek database.
 - Once Bryan is found, Andy and Jonathan’s locations are queried and an updated map is generated for Alexa.
- 6. Alexa finds Andy and Jonathan, and the Geo-Seek game session ends when all invited players are found.

Figure 2. Geo-Seek OpenMatch use case. In this example, a Geo-Seek user invites her fellow co-developers to a game of Geo-Seek with the Android app, registers the Open Match (playing without a Guild), and uses the Geo-Seek system to play.

PlayWithGuild

Initiated by Jonathan Green;

Joined by Alexa LaMontagne, Andy Santiago, Bryan Bradley

Flow of events

1. Jonathan, who previously install Geo-Seek and participated in multiple open matches, is ready to build a guild with his co-developers. He logs into Geo-Seek with his username and password and navigates to “Create Guild”.
2. In the “Create Guild” lobby, similarly to the list layout of “Open Match”, Jonathan is provided with options to invite Geo-Seek Users to join his Guild, along with a text field for giving a name to his new Guild. He invites Alexa, Andy, and Bryan to join his group and names the Guild “Geo-Seekers” and checks a field to additional add the invites to a new game (GameSession).
 - a. A new Guild is created with a name and initially composed of one User. For example, a new Guild “Geo-Seekers” is stored with one User (Jonathan) and empty game statistics.
3. Once invites Alexa, Andy, and Bryan accept the Guild membership in “Join Guild”, they are notified that they have become members of “Geo-Seekers”. In addition, they are notified of the current game and join to play.
 - a. The “Geo-Seekers” Guild game is added to GameSession and game statistics are tracked for the Guild play.

Figure 3. Geo-Seek PlayWithGuild use case. In this example, a Geo-Seek user invites his fellow co-developers to join a new Geo-Seek Guild named “Geo-Seekers”. An option is provided to the Guild creator to start a new match after inviting new members. The Guild is registered at the beginning of GameSession and Guild game statistics are tracked in the Guild table.

Database Entities (updated 10/14/2015)

GameSession

- ❑ A Geo-Seek GameSession is composed of a start/end time, the name of the Guild if the GameSession is tracked, winner(s)/loser(s), and a GameSession ID (gameSessionID) that functions as the invite to participate in a GeoSeek GameSession between Users.

Guild

- ❑ Constructed of a group of Users who frequently play together and want to play together with up to six players. A Guild tracks Geo-Seek game statistics for the Guild Users that play together, gathering information about the name of the Guild (guildName), the total number of GeoSeek games played, the Guild Users that won/lost, the Guild banner, the Guild Leader (the User that created the Guild), and the date the guild was created.

Playground

- ❑ The arena of a Geo-Seek GameSession. Determined by a predetermined range around the current location of the host of a GameSession in an “Open Match” automatically. In a “Play with Guild” mode, the option to save a map for later is available. The radius and startPoint are used to determine the field of play.

Photo

- ❑ A table that stores the photos of all “tags” during a Geo-Seek GameSession. Each photo contains geographic information, along with data about the time (timeStamp), the size of the photograph, a “tag” identifier, and the location the photo was taken (locationTaken).

User

- ❑ A Geo-Seek user that is registered to play Geo-Seek and be a hider or a seeker in Geo-Seek GameSessions. Users can also be members of Guilds that track Guild game statistics, and have a username, password, email, phoneNumber, and device_id.

List of Assumptions (updated 10/14/2015)

1. All GeoSeek Users have Android smartphones capable with the minimum requirements (running Android 4.4). All Android smartphones used by GeoSeek Users have cameras.
2. GeoSeek Users have smartphones that can capture Photo(s) during GeoSeek gameplay.
3. Some GeoSeek Users will play anonymously (non-Guild) play. All Geo-Seek Users capable of anonymous play are able to join a GeoSeek Guild.
4. GeoSeek Users can join more than one Guild.

Appendix A: Help Content

1. Google Maps APIs for Android:
 - a. <https://developers.google.com/maps/android/>
 - b. Geo-Seek uses the API for MapsViewer used by the Seeker in a game of Geo-Seek.
2. Android SDK

- a. <https://developer.android.com/index.html>
- b. Geo-Seek will be developed as an Android 4.4 app (API level 19).