Geoguard

GeoGuard

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User Guide

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1 Introduction

1.1 Purpose

Geoguard was built for the purpose of conveniently better managing passwords. Through GeoLocation, users will not have to scroll through a multitude of passwords to find relevant ones.

1.2 Layout Overview

Application Navigation Layout:

Key: "→" refers to the possible navigation to which screen
        " || " refers to or

(1)
Login Screen → Main Screen || Sign Up Screen
Sign Up Screen → Main Screen

(2)
Main Screen → Settings Screen || HomeBase Screen || Password Screen || Insert Screen

(3)
Settings Screen → Displays setting options
Homebase Screen → Displays passwords based on home base
Passwords Screen → Displays passwords dependent on current location as well those
                    that do are not dependent on location
Insert Screen → Displays insert fields that input data into database (Homebase or Passwords)

1.3 Physical Buttons for Navigation

Android Physical Back button - Navigates back for any screen in the application
Android Home Button - Leaves the application; Returns to standard android OS

2 How to Use: Functionality and Processes

The Geoguard application can be used simply by inserting passwords into a database that is locally stored to the android device and to an online database. These passwords can be tagged with or without a location. Automated checks through GPS or network provider allows the application to compare current location to tagged location, and securely provide tagged-passwords when needed. To understand how to make use of the application's functionality, refer to the section below for 2.x or 2.x.x

2.1 Initial Steps

* Important - This procedure must be done before application can be properly used.
* Note - Please use a physical android device to efficiently utilize the application.

(a) Installation

● To Install Geoguard application, please navigate to the git repository located in the apk directory to install the GeoGuard.apk
● When the apk is installed on the physical android device, use file browser to navigate to the file and open it. Android will take care of the rest.

(b) Enabling GPS

● Please navigate to your Android device's Settings and enable GPS for proper usage of the application. This will assist with obtaining device's current coordinates, tagging coordinates to passwords, and enabling notification functionality

2.2 Profile Creation and Signing In

Steps to *creating a profile*:
1) Open Geoguard application, which brings you to the Login Screen
2) Access Profile creation from here by clicking "new here?", which brings you to the Sign Up screen.
   a) "new here?" is located below the password entry element on the main login screen
3) Enter Username and Password in the labeled rows; re-type the same password in the confirm password row.

4) Profile Creation complete. These will be your login credentials
   a) This profile will be added to an online database that will save any user changes corresponding to the account, such as inserting passwords.

* Note - You can sign in offline on your android device, but only into the last account signed into that android device.

Steps to *signing in*:
1) Open Geoguard application, which brings you to the Login Screen
2) Assuming you already created a profile, log in with the credentials you inputted when signing up/creating a profile.
3) Signing In complete. Your screen should now be located at the main screen

2.3 Settings Configuration

* Note - Must have successfully logged in into account. After logged in, you are brought to the main screen, containing three buttons (1) Settings, (2) Passwords, (3) Insert

Steps to accessing *Settings* (this step comes after *signing in*, please refer to 2.2 if you do not know how to sign):
● To modify user settings for any preferred usage, click on the "Settings" button.

2.3.1 Setting Radius

* Note - You should be in the settings screen now

Steps to *change the radius*:
1) Click on "Change Search Radius," which pops up a box to select radius preferred
   a) To cancel after clicking this, you can tap anywhere outside the popup box
2) Click on one of the three distance options, in meters
3) Once one of the options are click, screen should appear show message "radius updated"
4) This will the specified radius for the duration of application usage, unless changed.

* *What is radius for?*
● The radius is for checking how far your device's current location is from the geotagged-password's location. This is used for notification purposes.
  ○ Example: You have a password tagged with the location of the desk in your home. When your device comes within the specified "radius" set range of that tagged location, you will get a notification notifying you of a password item nearby.

- The radius is also used similarly for the database. Getting within the set radius of a tagged password will display the password information in the Password Screen (database) under GeoTagged Passwords; it can also display in the Home Base screen if you are within the radius of the tagged home base location

2.3.2 Changing Username

* Note - You should be in the <u>settings screen</u> now

Steps to *change username*:
1) Click on "Change Username," which pops up a box to change username
    a) To cancel after clicking this, you can tap anywhere outside the popup box
2) You cursor should be in a field box labeled "New Username"
3) Type in the new username you prefer
4) Click enter
5) Username for account has been changed

2.3.3.Change Password

* Note - You should be in the <u>settings screen</u> now

Steps to *change password*:
1) Click on "Change Password," which pops up a box to change password
    a) To cancel after clicking this, you can tap anywhere outside the popup box
2) Your cursor should be in a field box for "New Password"
3) Type in the new password
4) Confirm the password by retyping it in the "Confirm Password" field
5) Click enter
6) Password for account has been changed

2.3.4 Setting the Home Base

* Note - You should be in the <u>settings screen</u> now

Steps to *change the home base* (sets current location as location of home passwords):
1) Click "Set Home Base," which pops up a box to set current location as home base
    a) To cancel after clicking this, you can tap anywhere outside the popup box
2) Click "Set Home Base Here"
3) Home Base is now set.

2.3.5 Logging Out

* Note - You should be in the <u>settings screen</u> now

To *logout*, click on "Logout"
- This should take you back to the login screen

2.4 Password Insertion in Database

* Note - Navigate to <u>main screen</u>. You can get here after signing in, creating a profile, or pressing the android's physical back button if you are in the menu for "Home Base", "Password", or "Settings"

Steps to *get to Password Insertion Screen* (from Main Screen):
- Click on "Insert"
- This should take you to the insertion screen to add a password to your database
- (Insert screen should have the following fields: "Enter Password Name", "Enter Password", "Save Location?"

2.4.1 Tagging Location to Password [Geotagged]

* Note - You should be in the <u>Insert Screen</u> now

To *tag a password with the current location*, follow these steps:
1) Type in a password name
2) Type in a password
3) Check the "Save Location?" checkbox (Leave unchecked to *not tag a location* to the password)
4) Click "Enter"
   a) The passwords are now available to be read in the password screen in the "Password" or "HomeBase" screen.
5) Data inputted is then clears from the password name and password input fields, so that you can input another password if needed

2.4.2 Non-tagged Location Passwords [Non-Geotagged]

Refer to 2.4.1 above. Do the exact same steps, except:
- DO NOT CHECK the checkbox for "Save Location?" at step 4).

2.5 Database of Passwords

* Note - These steps will assume you are at the <u>home screen</u>. Navigating to home screen can be done by Signing in, creating a profile, or pressing the android's physical back button from the screens for "HomeBase", "Insert", "Passwords", or "Settings"

To *view passwords:*
1) Click on the "Password" button
2) Display page is opened, containing a two split sections (containing passwords inserted from Insert Screen):
   a) GeoTagged Passwords
   b) Non-GeoTagged Passwords
   - Above is a "Reload" button, click when passwords are not yet loaded

* *Geotagged Password*?
● Geotagged password in password database will only appear when use is near the same location they entered the password

To *view the homebase passwords*:
1) Click on the "Homebase button"
2) Display page is opened, containing a two split sections (containing passwords inserted from Insert Screen):
   a) GeoTagged Passwords
   b) Non-GeoTagged Passwords
   - Above is a "Reload" button, click when passwords are not yet loaded

* *What is the homebase?*
● The HomeBase is the password display page that you specified in the settings for homebase; refer to 2.3 for Settings. If no homebase is set, this feature will **not work**. Homebase displays all passwords, regardless of whether they are geotagged or not.

2.5.1 Removing Password

* This assumes you are at the Password Screen from 2.5

1) Click on any password on the screen (GeoTagged or Non-geotagged), which will display a popup showing attributes, as location and password (in bold). It will also displays options to "remove", "copy", or "close"
   a) Click "close" to close the popup.
2) Click on "remove."
3) This will remove the password and its attributes from the password database

2.5.2 Copying to clipboard

* This assumes you are at the Password Screen from 2.5

1) Click on any password on the screen (GeoTagged or Non-geotagged), which will display a popup showing attributes, as location and password (in bold). It will also displays options to "remove", "copy", or "close"
   a) Click "close" to close the popup.
2) Click on "copy."
3) This will copy your password attributes to the clipboard.

2.6 Background Notifications

* Note: GPS needs to be turned on for Background notifications to work

To have *notifications work*:
- Insert Geotagged password in the database for Passwords Screen or Homebase Screen.
  - Location will be set at that coordinate.
- When **within** the set range/meters, specified by the radius set in settings, notifications will appear for that geotagged password.
- When **out** of range/meters set, notifications will disappear for that geotagged password
- Clicking notification will take you to the application's login page.
- Login and navigate to Homebase or Passwords database to see the geotagged password found.

3 Application Development

What has been done:

Login:

The password is never stored and just salted and hashed to generate a key that is used for encryption and decryption. This key is passed around to the appropriate activities that need to

be able to encrypt and decrypt. The local files are never encrypted but any data pushed to the server is encrypted and that data is decrypted when pulled back to the phone. When a user logs in the app will first check that the input is valid. After that it will check if the username matches the last one to login. If that is true it checks the password and logs in. Otherwise, the app first checks that there is an internet connection, checks the username in the database and pulls all the data that matches that username, stores the data in the phone and then logs in.

Sign up:

First we check that each field is valid then we check the two password fields match. Again the password is never stored but all the data is initialized to default values and we push all that data to the online database. If there is no internet connection we just give a warning that we cannot create an account without a network connection

Main Screen:
First we check if the homebase is set or not and if it is not we hide the homebase button. If the current location matches the homebase then we show it.

Settings:
The different settings can only be changed with an internet connection so the first thing we do is check for a network if one of those buttons are pressed and give the user a warning. The logout button is always active and just re launches the login screen.

Notifications:
To allow notifications to appear when the user is not using the application, a background service is created. Normally, functions of an application can only be called when an application is launched. However, creating a background service allows segments of an application to function, and be called, while the user is not actively using the application.
   1) Creating background Service:
          a. To allow services in the background, permission must be given in the Manifest.xml file.
          b. To start a service of a background upon accessing the application, a broadcast receiver must be called, which calls the service. This initially creates the service.
          c. Because the broadcast receiver only creates and calls a start function in the service one time, an alarm is needed to set off methods in the service
          d. We created another broadcast receiver which sets an alarm calling the receiver, which calls the service start function, in intervals of thirty seconds. This is set in the Android system, and the application would require rebooting to activate enable alarm.
   2) Constructing Notification:
          a) Creating a notification required using the Android API for standard builds and pieces for a notification
          b) Notification constructions and issuing occurred in the service

3) Comparing current GPS location to database tagged-password locations (for notification):
   a) GPS check and comparison occurred in the background service. It was called every thirty seconds by the alarm. How checks occurred:
      i) If database is empty, then return without gps check (saves network data and battery)
      ii) if database is not empty, check all entries
      iii) If current location is within the set radius of the a tagged password, issue notification, or increment number of passwords in message
      iv) if device is out of range of geotagged password, remove notification of that password, or reduce count of passwords in area
      v) If password is removed, database is reloaded (from "Passwords" screen)