Authentication of Smartphones using Behavioural Biometrics

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1. Introduction

In this paper, we focus on comprehensively summarising the state-of-the- art in improving a smart phone's security based on continuous authentication using behavioral biometrics. Behavioral biometrics, as defined in III-B, use behavioural traits of a subject like how one touches screen, walks, talks, signs
a signature, and types to identify a subject. Each subject is expected to differ from all others when analyzed using one or more of these features. In the following sections, we discuss in depth four types: keystroke, touch screen behavior, gait and hand waving, and also introduce other types such

as voice, A powerful argument for behavioral biometrics is that it can assist in continuous and passive authentication without requiring additional hardware. As a result, behavioral authentication is likely to be cheaper has using physiological biometrics. In the following sections, we will discuss several examples of behavioral biometrics. These are based on touch screen behavior, gait, keystroke, hand waving, voice, profiling and signature.

2. Requirements

IDE: Eclipse Galileo / Android Studio
Development Kit: JDK 1.6 and Android SDK
AVD: Android Emulator / Any Smartphone
Compiler: DVM (Dalvik Virtual Machine)
Testing: Unit Testing

3. How to compile and run ?

On Eclipse:

Open MainActivity.java and Run the program

On Android Studio:

Create the appropriate AVD and the program can be run on the emulator or an Android smartphone.

4. How to use ?

Step 1: Launch the application on your android device.

Step 2: After being directed to the home page there is a fingerprint icon. Place your finger on the designated region in order to reach the next page.

Step 3: You will be navigated to a page which asks to login in order to view the case evidence. First time users must touch the register option.

First time users:-

1. Enter your name, the username which you would like to maintain email address and mobile number.

2. There will be three authentication methods in front of you. You may choose any one as per your convenience

3. Voice: Touch the microphone symbol and use any phrase or word as your password as per your convenience and select the register button. This phrase will be used for future login purposes.

4. Sensor: Hold the android device at an angle which is convenient for you and a unique letter will appear in the bottom left corner. After selecting a letter as per your convenience register with the register button. This unique letter will be used for future login purposes.

5. Touch: The user will be given an option to choose between two authentication methods "image" and "draw".

6. On selecting the image authentication method the user will be shown a unique image and he/she must select an area of that image as per his or her convenience and must remember it for future login purposes.

7. On selecting the draw method you will be directed to a screen which has numbers from 0-9. The user may drag his finger along the numbers on the screen to make a shape/pattern of his/her choice.

Existing users:-

1. Select the login button.

2. Select the authentication method which you selected during the registration process.

3. Voice: Touch the microphone and say the word/phrase which you had said at the time of registration in order to view or add reports.

4. Motion: Hold the phone in a similar angle as at the time of registration in order to get the same letter and then touch the login button

5. Image: Touch the same region of the image as done during the registration process

6. Draw: Draw the same pattern/shape as done in the registration process by dragging your finger across the screen.

Note: Existing users may register multiple values or choose more than one authentication method by availing the register option and each authentication can store multiple data.

5. Contact

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