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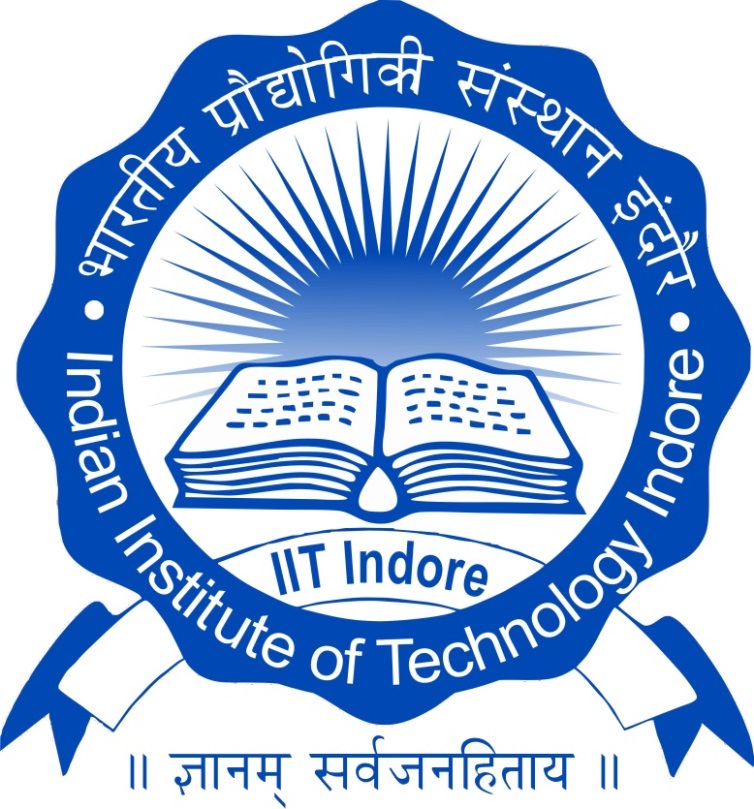
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**Department of Computer Science and Engineering**

**CS 258: Software Engineering**



**Project 10**

Mobile Application for User Identification based on Gestures and Pressure Applied on Touch Screen.

Software Requirements Specification

Version 1.0

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# 1. Introduction

This document is about the required specifications for an Android™ Application which can store analysed data for various gestures and pressure applied on screen for different users, and can identify the user based on stored analysed data.

## 1.1 Purpose

The purpose of this document is to provide a brief functionality and requirements of the application. This document is intended for all users with no prerequisite knowledge of biometrics.

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## 1.2 Scope

**1.** As people are getting used to different touch equipment, data protection for these touch devices becomes problem. One solution for this problem is to combine touch screens and biometrics together to build touch biometric authentication systems on the touch devices. When users put their fingers on the touch screens to control the devices, the related touching information from users is collected, analysed and compared with owner’s samples which are stored to verify the identity of users. In this way, touch devices are able to “recognize” their owners when their screens are touched by users.

**2.** The application requires a Smartphone based on Android™ platform, it will not work on any platform other than Android™ (i.e. Windows phone or ios).

## 1.3 Definitions, Acronyms and Abbreviations

* **Definitions**

**What is an Android™?**

Android™ is open source Operating System based on Linux Kernel developed and owned by Google Inc. designed for touchscreen mobile devices like smartphones and tablet PCs. It was firstly used on mobile devices and then expanded to the tablet PCs. The first publicly available smartphone running Android, the HTC Dream, was released on October 22, 2008. As of today Android™ is the most popular mobile operating system with about billions of users.

**Integrated Development Environment for the Application**

Eclipse is a popular cross-platform Integrated Development Environment (IDE). This project used Eclipse android SDK to develop android application to collect touch characteristics from individual users. After the programming environment was set up, a virtual mobile phone named Android Virtual Device (AVD) was used for running Android projects.

**Biometrics**

Biometrics (or biometric authentication) refers to the identification of humans by their characteristics or traits. Biometrics is used in computer science as a form of identification and access controls. It is also used to identify individuals in groups that are under surveillance.

**Android™ Emulator**

Android Emulator is a virtual mobile device that runs on your computer and allows you to test developed applications without using a physical device.

* **Acronyms and Abbreviations**

**ADT:** Android™ Development Tools, the process by which new applications are created for Android™ Operating System.

**SDK:** Software Development Kit, which includes a comprehensive set of development tools like debugger, libraries and emulators etc.

**IDE:** Integrated Development Environment, a platform for developing the Application.

**AVD:** Android™ Virtual Device, a utility provided by Google as part of the Android™ SDK which allows creating Emulated Android Devices.

## 1.4 References

* Android™ Developers: [developer.android.com](http://www.developer.android.com)
* Wikipedia: [www.wikipedia.org](http://www.wikipedia.org)
* Tutorial Points: [www.tutorialspoint.com](http://www.tutorialspoint.com)

## 1.5 Overview

This document is structured as follows

1. Section 1 Consists of the preliminary Introduction regarding the Project
2. Section 2 contains the general description of Project.
3. Section 3 talks about the specific requirements of the Project.

# 2. General Description

This Section contains the basic and optimum description regarding the Application.

## 2.1 Product Perspective

1. This Application is platform (Operating System) dependent and runs on Android™ Smartphones or Tablet PCs with Android™ version higher than 2.2 (Froyo).
2. Most of the currently available user authentication systems and firewalls do not provide any authentication functionalities to identify the users who access the computer system. But with the growth of information and scientific data in today’s society, data protection and confidentiality becomes increasingly important. One efficient way is validating users with legitimate accounts and giving the data access control to the users.
3. As people are getting used to different touch equipment, data protection for these touch devices becomes problem. One solution for this problem is to combine touch screens and biometrics together to build touch biometric authentication systems on the touch devices. When users put their fingers on the touch screens to control the devices, the related touching information from users is collected, analysed and compared with owner’s samples which are stored to verify the identity of users. In this way, touch devices are able to recognise their owners when their screens are touched by users.

## 2.2 Product Functions

To verify whether every user has special touching characteristics, personal touch information needs to be collected and analysed. A data collecting and classification method was designed and implemented to collect the touch parameters and properties from individual users. An Android application is developed as the tool to be installed into a touch device and collect touch information such as finger location, finger pressure and finger movements from individuals. Then this data collecting process is tested through a quantitative method. Multiple users perform the same touch testing experiment under the same testing conditions. Observation and analysis from the data of full test can show the different touching characteristics from individual users. Statistical methods are applied to measure and analyse observations in order to improve the accuracy of the results. Based on the data of the experimental testing, the various comparisons of several touch parameters among different users will be discussed and evaluated, with respect to achieve a good accuracy of individual identification.

## 2.3 User Characteristics

The specific requirements of this Application will vary as the characteristics of user will change. This variation can be categorised for 4 types of users.

* The users who have never used any touch devices.
* The users who have not owned any touch devices but used some public machines with touch screens a few times.
* The users who have touch devices but use them with a low frequency such as once a week or several times per month.
* Most important, the users who have at least one touch device and use it every day.

## 2.4 General Constraints

* Every time when the users touched the screen, only one finger could be used, 2 or more finger touching points makes subsequent analysis and classification more difficult.
* Sufficient Memory should be available to store the collected data, as for analysing a user more and data is required.

## 2.5 Assumptions and Dependencies

* As long as phone supports the required Android™ constraints, this application so designed will work fine without any problems.
* The working and performance of the application will be good with sufficient availability of RAM, storage capacity and good processor.

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