# Stegano

# Functional Spec

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# Contents

## Introduction

The steganography tool will be made using Android Studio and Eclipse IDE. The app will be a tool to enable users to embed, extract, encrypt, decrypt and detect steganography. These are the core functions of the app and will be pinned on the home page. The target audience has no age restrictions and is open to anyone that wishes to effectively conduct covert communications with another. This app also has commercial appeal. This is the main difference between Steganography and cryptography. Since the app will also allow the user to encrypt and decrypt using the AES standard, one can say that this is an overall method of secure communication when compared to just a standard channel that's encrypted. With a standard encrypted message being sent, an eavesdropper can still manage to identify that a message was sent from person A to person B. With this tool an eavesdropper wont be able to detect a message being sent because it will be embedded into the image. Therefore, the only form of communication the eavesdropper will see is in fact the non-suspicious stego image.

As mentioned above, the app will have 5 core functions:

1. Embed
2. Extract
3. Encrypt
4. Decrypt
5. Detect

A user will easily be able to travel through the functions and the app will be made to ensure that users with vision impairment can still use the app.

## System Functions

This app will be similar to other steganography apps in the sense that the user will have the ability to upload an image, embed a secret message or extract a secret message. After my initial research I have not been able to identify a mobile steganography app within the android play-store that supports AES encryption and decryption nor one which has the ability to scan an image to attempt detect steganography.  This is what will separate this app from the rest.

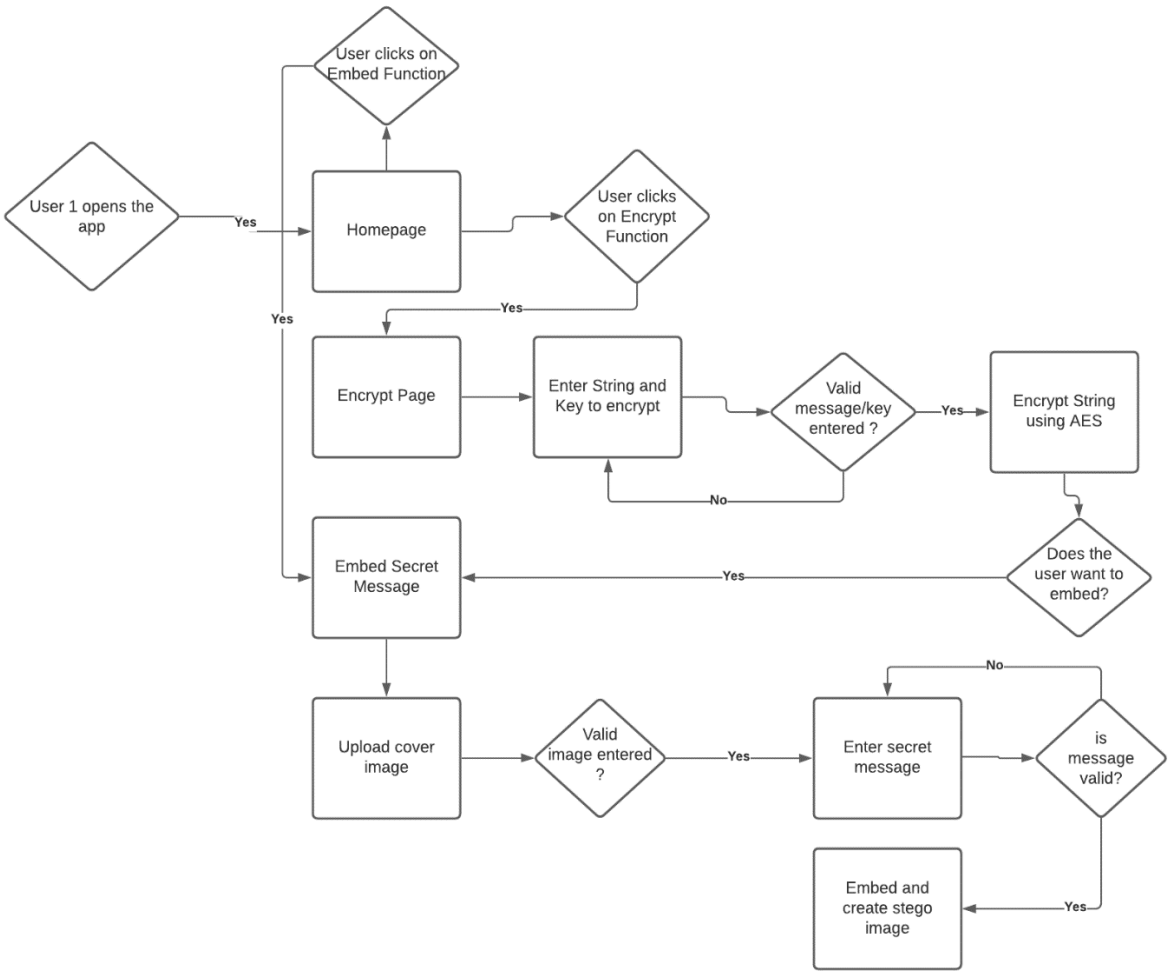
When the app is opened in a mobile device the user will enter into the home page. The home page will have all 5 core functions. The home page will contain a welcome message.

There will be 3 types of users using this app.

1. A user that wishes to encrypt and embed a message into an image
2. A user that wishes to decrypt and extract from an image.
3. A user that wishes to scan an image to detect steganography.

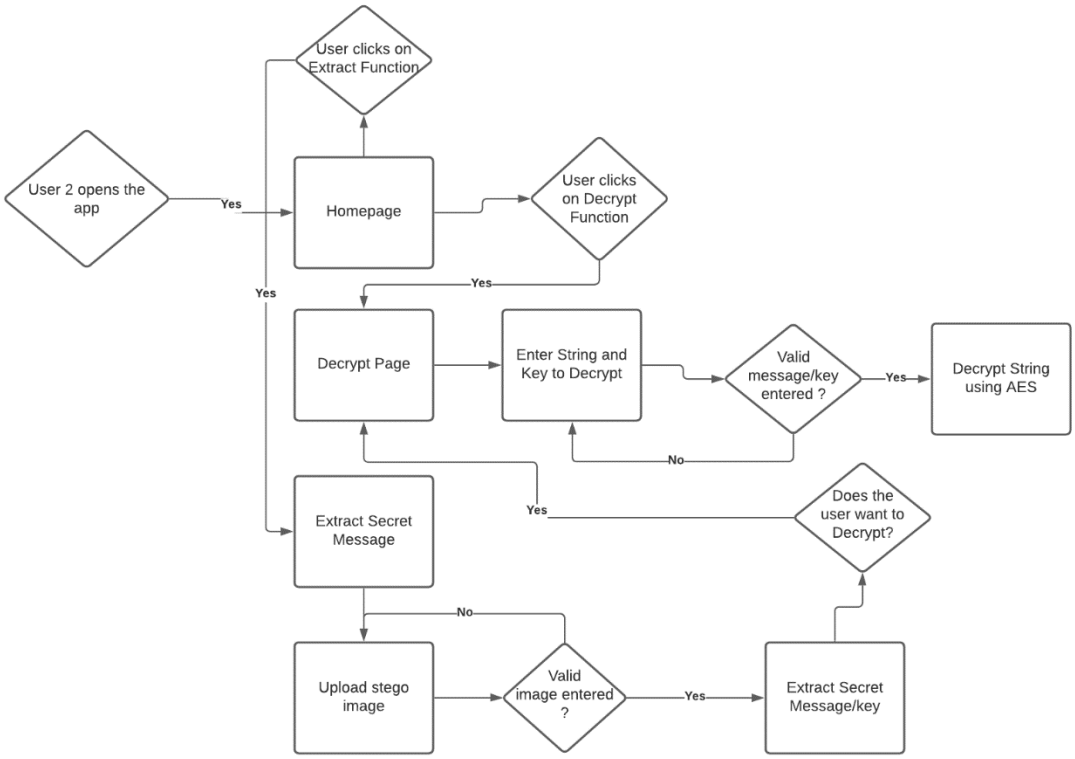
The app will support smooth movement through-out the different functions. No matter what page a user is on, they will have access to the bar at the top which will house the 5 core functions. There will also be a back button which will allow the user to return to the previous page. Below are examples of how the different users mentioned will operate their tasks.

### 1. User 1 operational flow diagram



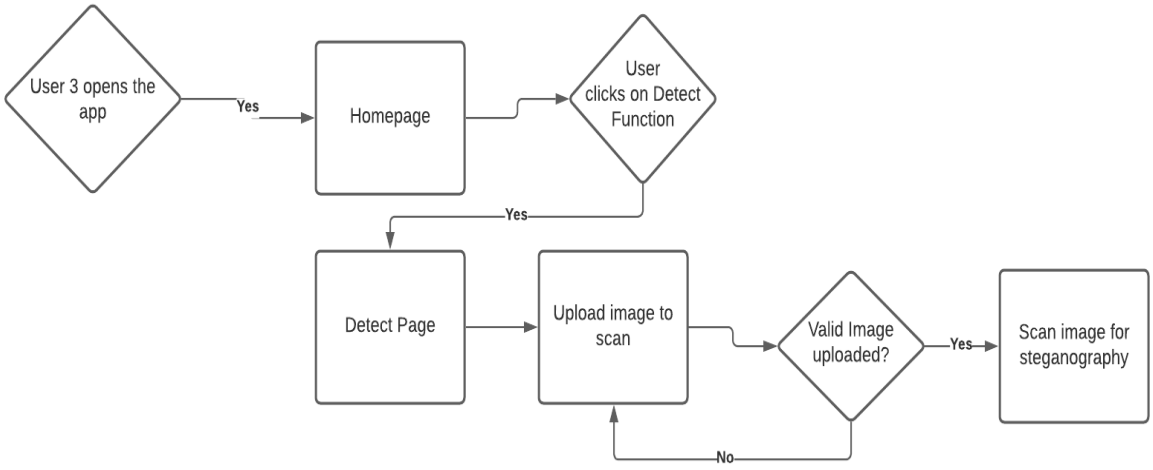

As seen above, the user can easily encrypt and embed from the homepage. If a user encrypts a message, they will be asked if they wish to embed into an image. If correct, then they will be redirected to the embed page and asked to upload a cover image.

## 2. User 2 operational flow diagram




As can noticed above, the user can access the decrypt and extract pages with ease. After the user has finished extracting, they will be prompted with a question on whether or not they wish to decrypt the message.

## 3. User 3 operational flow diagram




As seen above, without difficulty the user can upload an image and scan it to detect steganography. The user can click on the detect function from the homepage.

# System Requirements

## Coding Language

This app will be coded using Java. The reason being is that the developer has experience creating java applications and android studio allows java mobile app development.

## Device

The device which will be used to demonstrate the program in use will be an android mobile phone. Since this app is aimed to be a mobile app it is best to demonstrate it on one. However, if issues arise with this, I can demo the app in Invision. Invision is a digital product design platform. I have used this during my work placement to demo an app from android studio.

## Operating System

This app will be coded on a Windows 10 operating system. Android studio and Eclipse work very well on windows 10, plus Iam very familiar with it.

# Constraints

During the development of this app there will be various constraints due to the strict deadline and the never-ending curse that is Covid-19. Not to mention that the app will be developed and designed by 1 individual. There will be unforeseen roadblocks during the development of the app due to the fact that the developer is not a professional. Using an agile approach should make sure that steady progress is achieved.

## FURPS

Furps is a model designed by Robert Grady which helps define context to the requirements of a project. This model takes into account both the functional and non-functional requirements.

### Functionality

This steganography tool and its functionality have already been defined in the system overview section. The tool will have 5 core functions embed, extract, encrypt, decrypt and detect.

### Usability

The steganography tool will be an android application which will ensure ease of access and a smooth flow through the app. The normal user will find the app easy to use and should be able to complete each core function without any problems. The user will not require any IT knowledge to carry out the core functions of this app.

### Reliability

Since this app is a ‘download and install’ type of app, there should be no loss of uptime. It should function 24/7. Should any patches be required, this app should be able to

accommodate this in a quick fashion by pushing it to the app store. This app is a stand-alone app.

### Performance

The mobile app should have a high degree of speed and response times when travelling through the different pages. Performing the embedding and extracting may take a minute or so and scanning an image for steganography may take longer. The app overall should not be too resource intensive.

### Supportability

Due to the fact that this is a mobile app, new modules and patches can be pushed to the app store where the user can easily download and install these updates.

## Metrics

The app is considered complete and a success if the following conditions are met:

- A functional app is created in Android Studio.
- Users can upload a cover image and use it to embed a secret message.
- Users can upload a stego image and use it to extract a secret message.
- Users can encrypt and decrypt the secret message.
- Users can scan an image for steganography.