Design Practices Project Report

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During this design practices cource , we learnt a lot of new stuff , we all got to understand concepts of machine learning and deep learning in depth , we also had some hands on raspberry pie kit . We learnt to use Andorid studio and built apps using the skills gained from it , indeed we also became well versed with one of the famous backend databse i.e firebase . We learnt Real time authentication and database . We also Learnt about various measures to be taken during authentication like graphical part and image segmentation to distinguish between bots and human . We also learnt about AES encryption system and also got to know about bot attack . Overall this course helped us to learn new things and further develop our skills .

Facial Recognition:

We made and deployed face Recogntion model . We used machine learning knowledge to understand and implement this . We trained our data on out training data and when a testing image comes or a frame is extracted from the live stream , our models matches the two images on basis of simlarity by considering 68 points on the face . We have used classifer which uses SVM(support vector machine) . We used dlib , face_recognition and opencv library in our model . In order to improve the accuracy , we tweeked several parameters like changing tolerance of our model etc . Our Model makes a square box on the faces of the people detected and if the person is known then it recoganises it and displays the name else it displays unknown.

Applications:

- We may deploy the system at the entrance of the class/institute/hostel. Every authorized member is required to get access through the system.We may also choose an audio to announce an un-authorized access and alarm the security centre.

- We may deploy this model for automated attendance system.

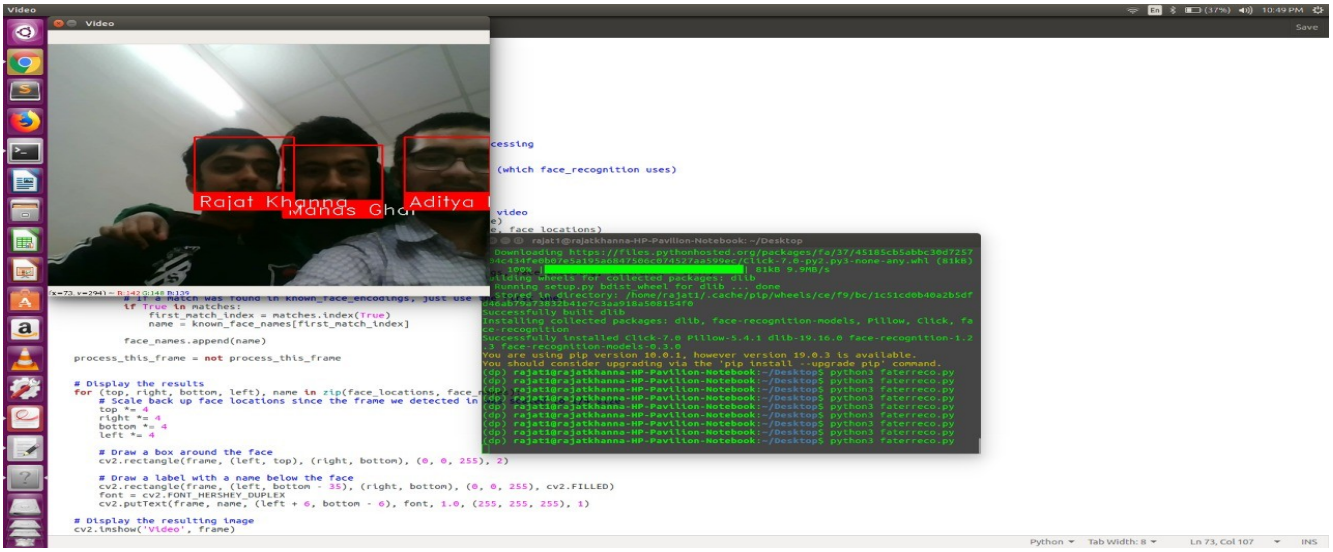
Advantages:

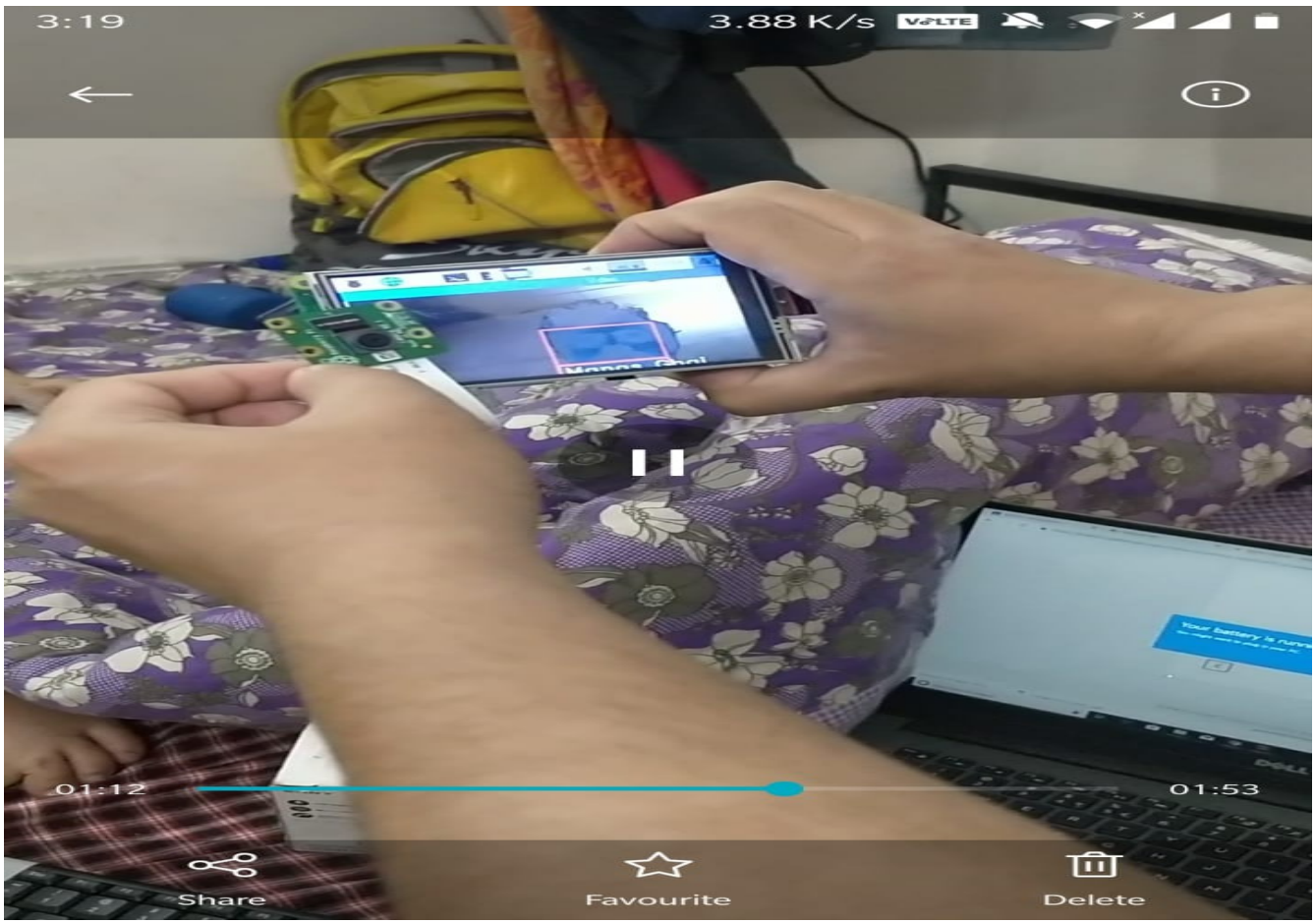
- The system is detects and recoganises faces of people in live stream.

- It has quite high accuracy and we achieved this by tuning with other parameters such as tolerance etc.
- It is integrated well with hardware like raspberry pie.

Disadvantages:

- In absence of the light , accuracy is not so high and it is unable to detect faces.





MESS APPLICATION

In this assignment, we developed an app for accessing the crowd status in IIT Jammu mess. We analyzed the video to get the count of members utilizing mess at a particular time. This app provides real-time information about the mess. In addition, this app has the following features:

- User can book some special food (if possible) for the guest

- User can find the schedule and current day (or any date) menu of the mess
- This app should also be able to inform you about the less busy hours based on its learning.

We came up with your own ideas about how to make and then deploy this mess app.
We built the Mess Application using android studio . We first made a registeration page for a new user for registeration , then we made a login page to authenticate the user . We made a Dynamic menu(which shows the Breakfast , lunch and dinner of current day) which keeps changing according to calender. We also attached mess menu of whole week , in addition to it we provided contact support for the user . We also made a order option in which user can place orders on the required date and time.
We have used firebase database as backend database which keeps track of real time data access and authentication . To implement counting of number of people in mess we used firebase's ML-developer kit which helped us to count the number of people currently in mess.

Features:

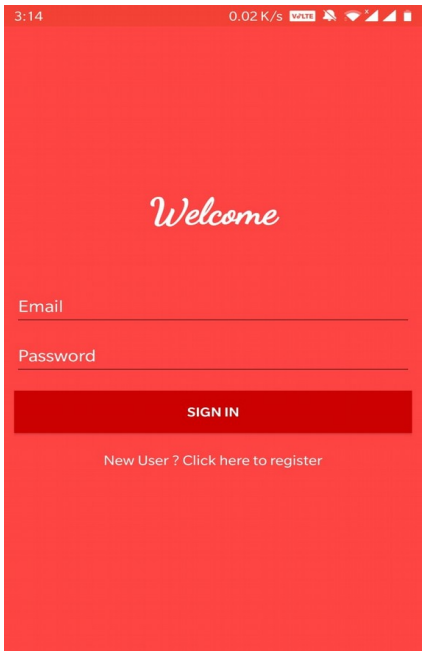
- Users would be given a registration form that has to be filled with required details.
- Next users would be asked to login into the app and access the featues
- User can see the dynamic menu and use contact us feature
- Floating button is present in right bottom corner which has schedule, orders and FaceDectctionModel(Only for Admins)
- User can place a order and can view his/her previous orders and it is totally realtime .
- The user can see the count of people at bottom of page along with a picture of mess which keeps updating after few seconds.

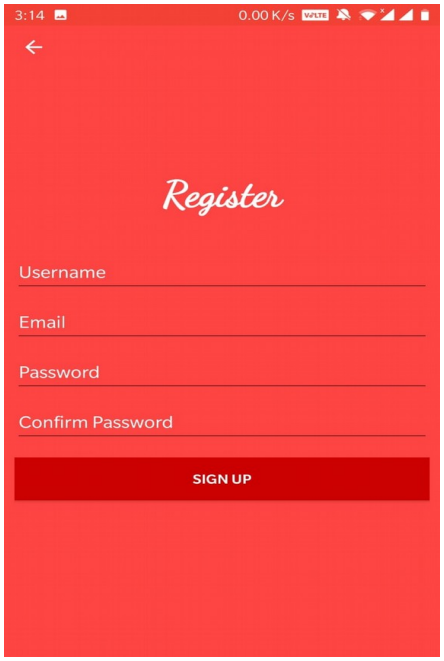
Advantages:

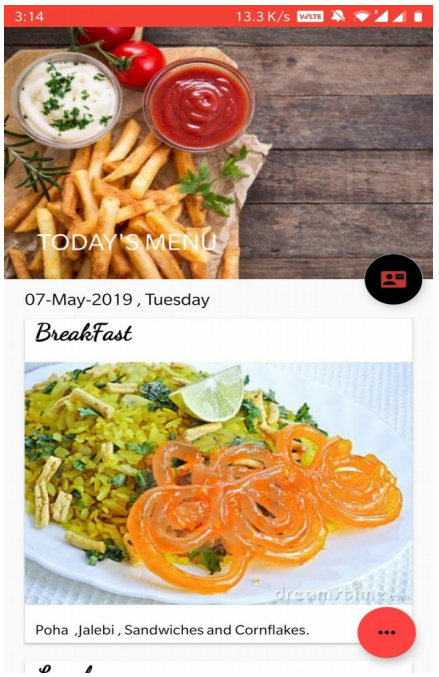
- Fast and Easy to use.
- It is highly reliable and secure.
- One app provides you with all the details required regarding mess along with placing orders and getting to know least rushy hours.

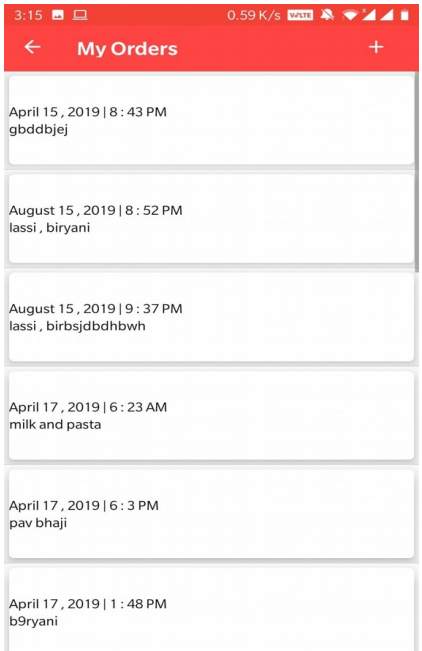
Further Improvements:

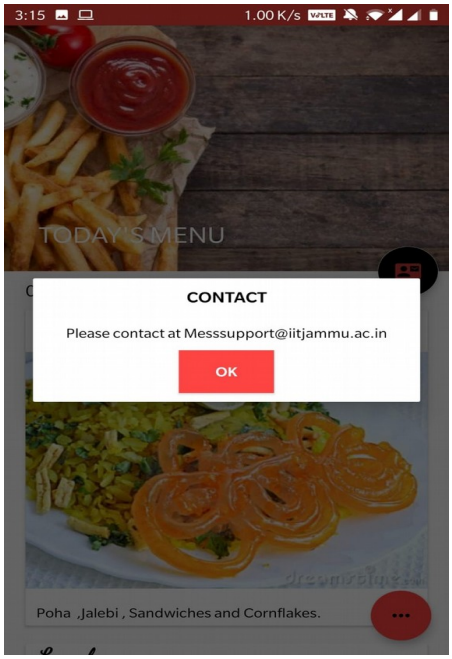
- we can add payement option when user places orders

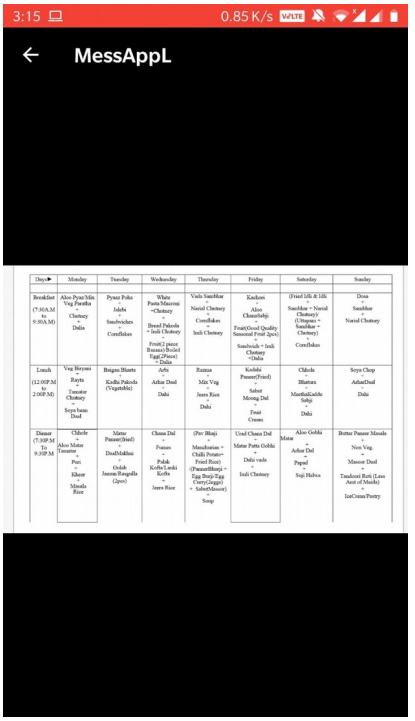


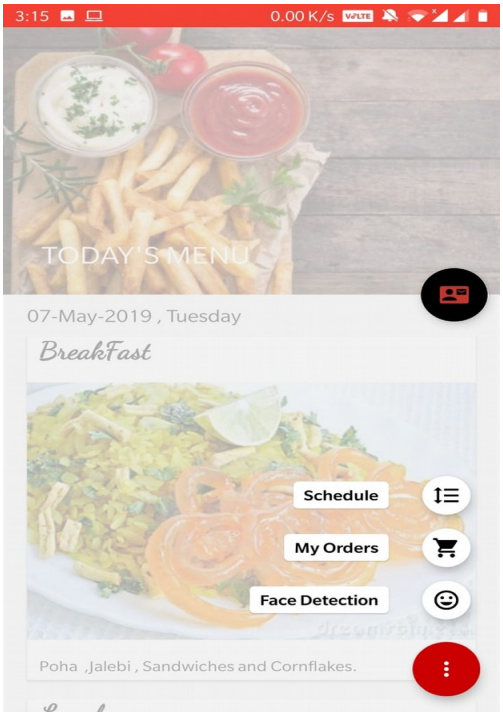


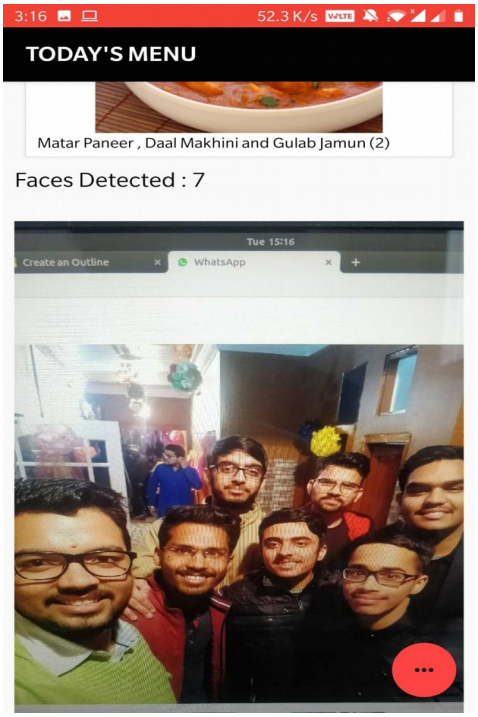


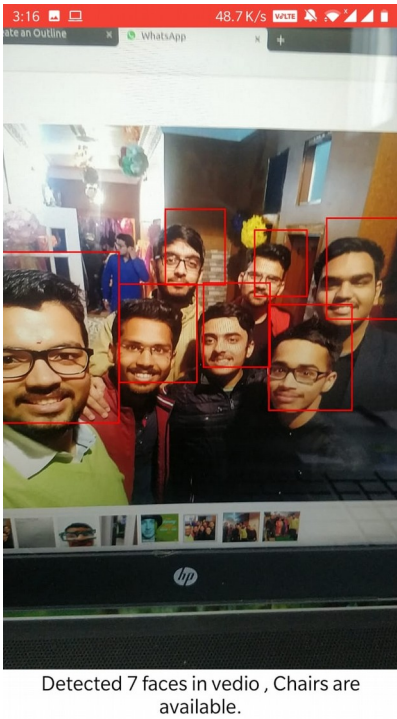












Detected 7 faces in vedio , Chairs are available.

Three Level Authentication System

The project is an authentication system that validates user for accessing the system only when they have input correct password. The project involves three levels of user authentication. Almost all the passwords available today can be broken to a limit. Hence this project is aimed to achieve the highest security in authenticating users.

It contains three logins having three different kinds of password system. The password difficulty increases with each level. Users have to input correct password for successful login. Users would be given privilege to set passwords according to their wish. The project comprises of text password i.e. password phrase, graphical password and image based password for the three levels respectively. We have also used reCaptcha in our authentication system to avoid bot attack and allow access only to humans . This way there would be negligible chances of bot or anyone to crack

passwords even if they have cracked the first level or second level, it would be impossible to crack the third one and the reCaptcha. Hence while creating the technology the emphasis was put on the use of innovative and untraditional methods. Many users find the most widespread text based password systems unfriendly, so in the case of three level password we tried creating a simple user interface and providing users with the best possible comfort in solving password.

Features:

- Users would be given a registration form that has to be filled with required details.
- Next users would be asked to set password for first level, second level and third level subsequently.
- After the passwords are set for the three level users can now login into the system.
- While login the system will ask for the first level password. On entering correct password, second level password is asked and then third one.
- After the user has provided correct password in the third level, he gets authenticated and can now access the system.

Levels in the system:

1. **First Level:** The first level is a conventional password system i.e. text based password or a password phrase. Users would have to set a text password initially based on some specifications.
2. **Second Level:** The second level is a graphical password method where users have to set password based on some color combinations through RGB button combinations.
3. **Third Level:** The third level is an image based password where users can upload their desired image into the system and then create password by segmenting it and assigning them serial numbers.

We have built an android application implementing these features using firebase as backend and google's reCaptcha API.

Advantages:

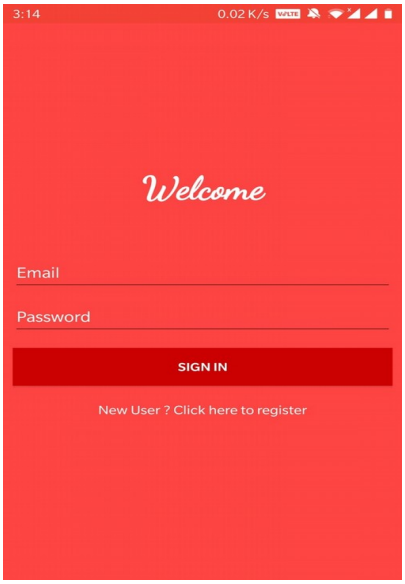
- The system is user-friendly and has simple interface.
- Provides strong security against bot attacks or hackers.
- Protects systems vulnerable to attacks.

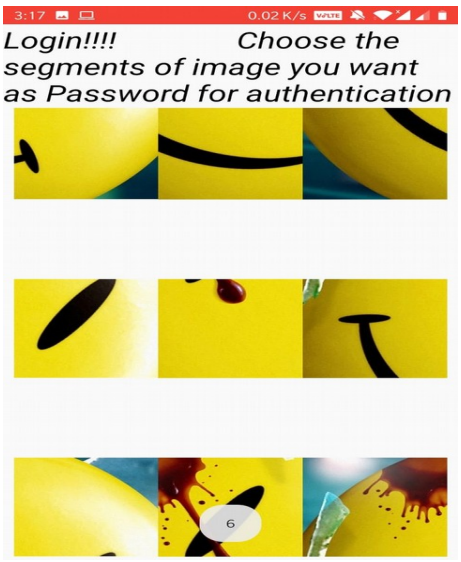
Disadvantages:

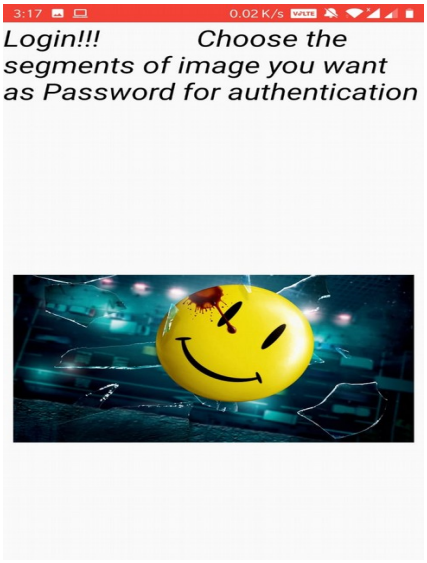
- The only disadvantage is if users forget the password, it cannot retrieve it.

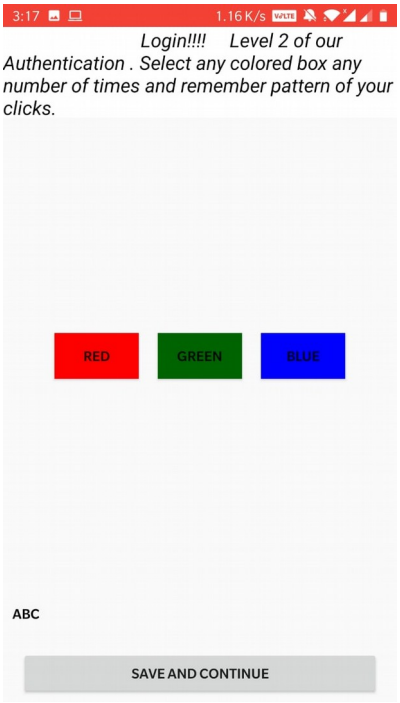
Applications:

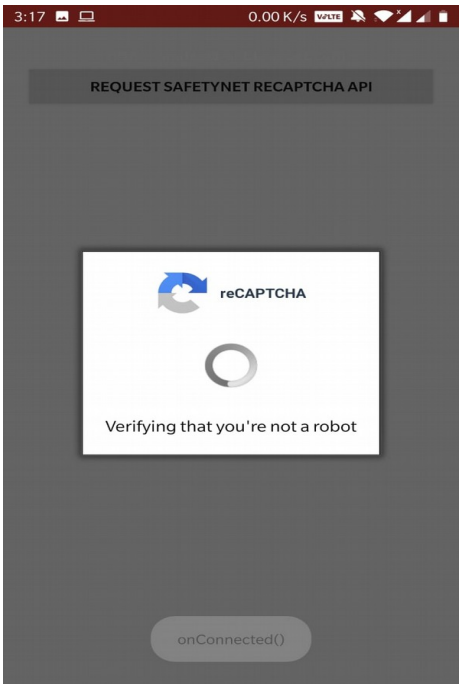
- It can be used by individuals or over the internet to protect the system.











Android based Encrypted SMS System

This is an Encryption and decryption System targeting the SMS for Android Users . The User can send an Encrypted message while he can decrypt an encrypted message. So whenever the user is sending a message he should know the phone number. This System makes use of AES Encryption Algorithm to encrypt and decrypt the messages. This Application uses Android Studio as its front end and firebase as back end for authentication.

- **Encrypt**: The user can use this feature to encrpyt the message and send it to required person via SMS .

- **Decrypt:** The user is allowed to view the complete message which is decrypted as he selects the messages from the Inbox.

Advantages:

- Fast and Easy to use.
- No Internet Needed.
- It is highly reliable and secure.

Disadvantages:

- The user has to login from his phone to see decrypt the messages.
- Messages can't be saved.

Applications:

- This system can be used by companies or person who want to keep message private and safe

Further Improvements:

- Since only encrypted messages will be showed in this app it saves a lot of time.
- The user has to login keeping the data secure
- The messages will be filtered and kept in the the inbox , favourites column can be added which would automatically filter messages of those close to us.