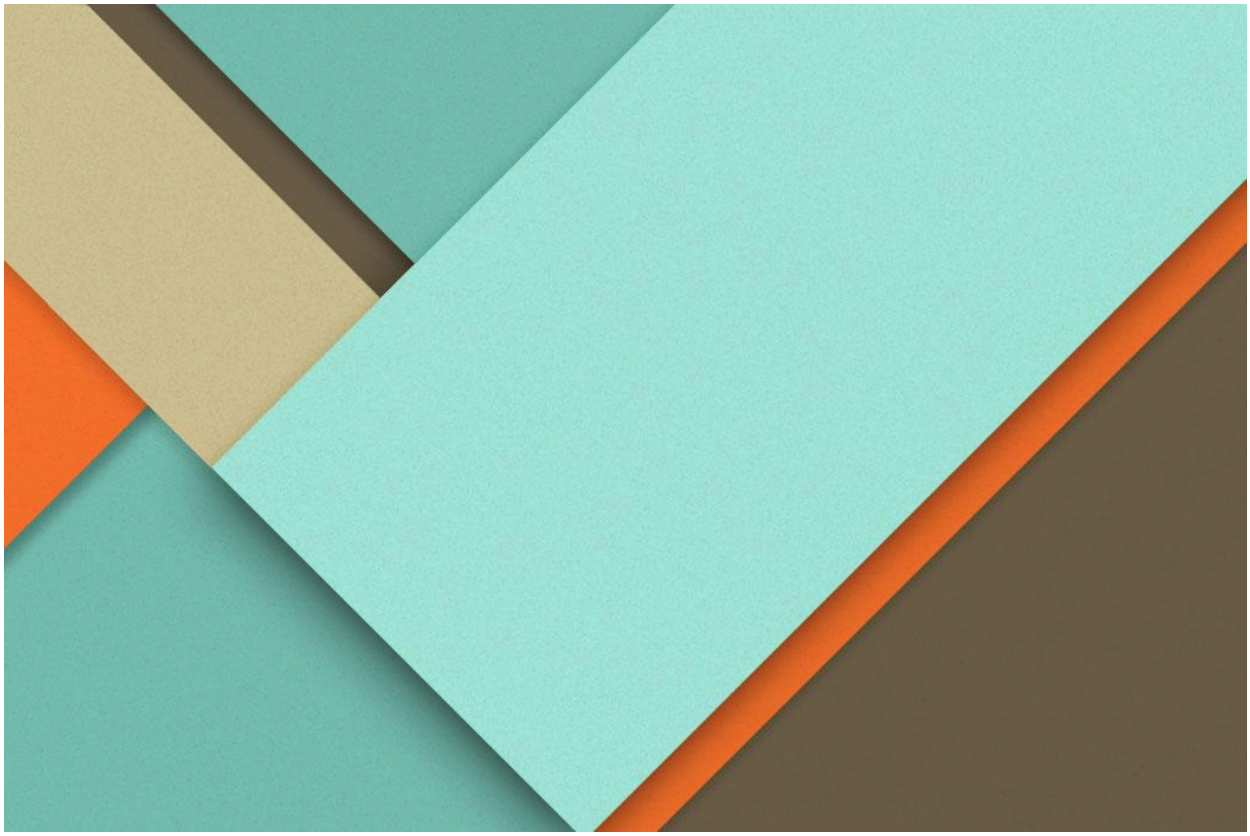

# CAPTURED

TechMakerz

## Overview

An android app which uses modern AI techniques to solve the one of the major security issue "THEFT" in India. Yes your own **Android mobile** would act as a **guard** to your house.

## Specifications

While thinking for the idea we found ourself digging around the problem of lack of cheaper and safer security solutions for our homes.

Hence we planned to use the latest technologies and expertise in the best way to make a project that would try to solve one of the biggest security problems of the society.

Then, we collaboratively came up with an idea of making an Android App which will detect unwanted person in the home with the help of Artificial Intelligence and will notify the owner in their absence.

## How it works (Application) :

User have to first install the android app inside your android device and that's the only major part :P

After that just make a new account on the app and add the mobile number on which you want to get notified when a thief get **CAPTURED** .

Let's call this number **contactEmergency .**

And that's the only work you had to do. Now whenever you have to go somewhere and you are concerned about the **Jewellery** or **cash ,** you just have to put your mobile device on a proper location so that it covers the entrance area of **house, main room** or whatever place at which you think the thief will definitely come. (Back or front camera of mobile should cover that location).

Now that's it whenever a suspect will come to that location, your mobile will capture that and using **IMAGE PROCESSING** and **ARTIFICIAL INTELLIGENCE** it will notify you that a suspect has come to your house with the relevant **picture** of him. And now you can take immediate actions against him during the time he would be busy in executing the theft. :P

He has been captured by **CAPTURED.** There is no way to escape.

## Implementation

Implementation to this app is a two step process:

1. At first our app will keep clicking the pictures using the mobile camera (placed at desired location ) recursively with a delay of some time period. Then it convert that image file into blob (binary form) and sends it to our server.

   Now the server side work begins, which is the second and main step :

2. Now we have the blob image on our server. Now we are using image processing to process its different layers and identify whether there is a new human being comes in the picture as compared to the previous image (No Human) .

**If No** : No worry, It keeps doing the above two steps recursively.

**If Yes** : User will be notified using the push notification and also a message will be sent to the the mobile number which you have added in the emergency contact (**contactEmergency**) saved in the app. And the message will include the alert that "A Theft has been detected inside your house and also the link to the picture which is suspicious .

## Tools Used

1. **Android studio** for front-end of the android app.
2. **Blob image** conversion library to convert images into encrypted form for efficient exchange of images from server to mobile device.
3. **Image processing** in layers using python library **OpenCV** and we have used special deep image analysis algorithms those are mentioned in the algorithms section.
4. Server to device integration is done using **PHP Laravel framework**.
5. **Dropbox API** is used to store images with suspicious activities.
6. **Firebase push notifications service** is used to send push notifications to the owner of the house.
7. **msg91 api** is used to send text sms in case of non-availability of internet connection on owner's mobile device.

## Data structures and Algorithms Used

- Model-based face tracking
  There seems to be a revival of edge-based methods, using geometric models. Two top performing methods have been published in the early 2000s:
  - Real-Time Face Detection Using Edge-Orientation Matching
    Fröba, Küblbeck: Audio- and Video-Based Biometric Person Authentication, 3rd International Conference, AVBPA 2001, Halmstad, Sweden, June 2001. Proceedings, Springer. ISBN 3-540-42216-1.
  - Robust Face Detection Using the Hausdorff Distance
    Jesorsky, Kirchberg, Frischholz: Audio- and Video-Based Biometric Person Authentication, 3rd International Conference, AVBPA 2001, Halmstad, Sweden, June 2001. Proceedings, Springer. ISBN 3-540-42216-1.
    - Genetic Model Optimization for Hausdorff Distance-Based Face Localization

Kirchberg, Jesorsky, Frischholz: International ECCV Workshop on Biometric Authentication, Springer, Lecture Notes in Computer Science, LNCS-2359, pp. 103-111, Copenhagen, Denmark, June 2002.

- Weak classifier cascades
  The breakthrough in face detection happened with Viola & Jones. Using a cascade of "weak-classifiers", using simple Haar features, can – after excessive training – yield impressive results. This approach is now the **most commonly used algorithm for face detection.** A basic implementation is included in OpenCV.

A nice visualization of the algorithm can be found here: https://vimeo.com/12774628

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