

# Android Application to detect the Spurious Medicine

Project is implemented with an objective that emerged from the below questions

How well do you know about the Medicine that you are consuming?  
What are the alternatives for that corresponding medicine?  
Drug you are consuming is really not a spurious one?

We started asking more questions about how critical is the problem we are to solve.

It came out that checking the authenticity of the Drug would find a decent number of customers and it could add some commercial value, making our application as a Minimum Viable Product.

Discussion to solve the Problem

Implement OCR test on the Medicine strip to extract the text and process it further.

Choosing Android application/Website application as an end product.

## Approach 1:

Building the Android application using the existing Optical Character Recognition(OCR that extracts text from an image) libraries and extract the Medicine name and display the contents like Active ingredients, usage and its alternatives in a VR Environment and apply some Image Processing techniques to check for spurious medicine.

Tools and Technologies used:

OCR library by Google Vision

Android Studio

Android mobile to run the Simulation

Problem:

Since we are using the existing library for OCR, it extracts the whole text from the Medicine Strip. Processing to get only the Medicine name is not possible because OCR cannot be modified to give the Medicine name and also its not accurate. So, It cannot be done this way.

## Approach 2: (Solves 1st Part)

We searched for more alternatives to extract the Medicine name from a Camera either by Scanning or Capturing. This idea let us to explore more about QR code where it could be only used for Identification and not authentication. This solves the first part of our Project. And the VR environment is built using a framework.

Tools and Technologies used:

QR code Library from GitHub

Bootstrap Framework  
Aframe Framework for VR  
VR Box  
An Android Mobile

### Approach 3:

Since the first part (Identification of Medical name and displaying its contents) is done, we have tried to establish an encrypted mechanism to the whole supply chain management right from Manufacturer to Customer.

#### Problem:

But it means to design the whole system which is very complex and the application couldn't find its target Customers and it doesn't workout.

### Approach 4: (Solves the 2nd Part)

We had found out that Image Processing alone cannot yield the accurate results because it's the user who uploads the Image. Tolerance for the angle and lighting conditions in which the image is captured forms the factors that could lead to wrong results. Later, after going through many Image processing techniques, we had picked up some techniques that could give us the better results. Tests we adopted are explained in detail below.

- Histogram Equivalence

It's basically compares the Histogram (Frequency distribution of Colour Pixels in an Image) of the uploaded Original and Sample Images.

- Template Matching

Its searches for Patterns (like Logo) in the uploaded sample Image.

- Text Comparison

OCR have been performed on both the Images to extract the text and they have been checked for similarity.

All the tests are performed in increasing order of their comparison ability. So if any sample fails in any of the tests, it indicates that the uploaded sample Medical strip is not an authentic drug.

#### Tools and Technologies used:

Image Processing using OpenCV2 python.  
PHP to run all the codes in Server  
Xampp having Apache and MySQL Server  
Android Mobile to run the Simulations

Note: The uploaded Images are processed and compared in Local Server and the result is retrieved in Android Studio and displayed in Mobile application using php.

If the accuracy in detection increases, it could be extended to others like Fake Currency, Certificate check etc.

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Regards

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