

**DOCUMENT ARCHITECTURE**  
for Mr. Gandha Satria Adi, S.T., M.Eng

# ARCHITECTURE SYSTEM

## Technology Stack

**Blencong.io** is built with quite new and popular technologies. Further we would like to list all technologies we have used and write a short description for each.

### 1. Backend

#### a. Google Cloud Platform (<https://cloud.google.com/>)

Google Cloud Platform (GCP), offered by Google, is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end-user products.

#### b. Cloud Pub/Sub (<https://cloud.google.com/pubsub>)

Cloud Pub/Sub is a scalable, durable, event ingestion and delivery system that supports the publish-subscribe pattern at large and small scales. Cloud Pub/Sub makes systems more robust by decoupling publishers and subscribers of event data.

#### c. ML Kit for Firebase (<https://firebase.google.com/products/ml-kit/?hl=id>)

ML Kit is a mobile SDK that brings Google's machine learning expertise to Android and iOS apps in a powerful yet easy-to-use package. Whether you're new or experienced in machine learning, you can implement the functionality you need in just a few lines of code. There's no need to have deep knowledge of neural networks or model optimization to get started. On the other hand, if you are an experienced ML developer, ML Kit provides convenient APIs that help you use your custom TensorFlow Lite models in your mobile apps.

#### d. TensorFlow(<https://www.tensorflow.org/lite>)

TensorFlow Lite is a set of tools to help developers run TensorFlow models on mobile, embedded, and IoT devices. It enables on-device machine learning inference with low latency and a small binary size.

### 2. Software Tools Kit

#### a. Android Studio 3.5(<https://developer.android.com/studio>)

Android Studio is the official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA . On top of IntelliJ's powerful code editor and developer tools, Android Studio offers even more features that enhance your productivity when building Android apps

### 3. Hardware Tools Kit

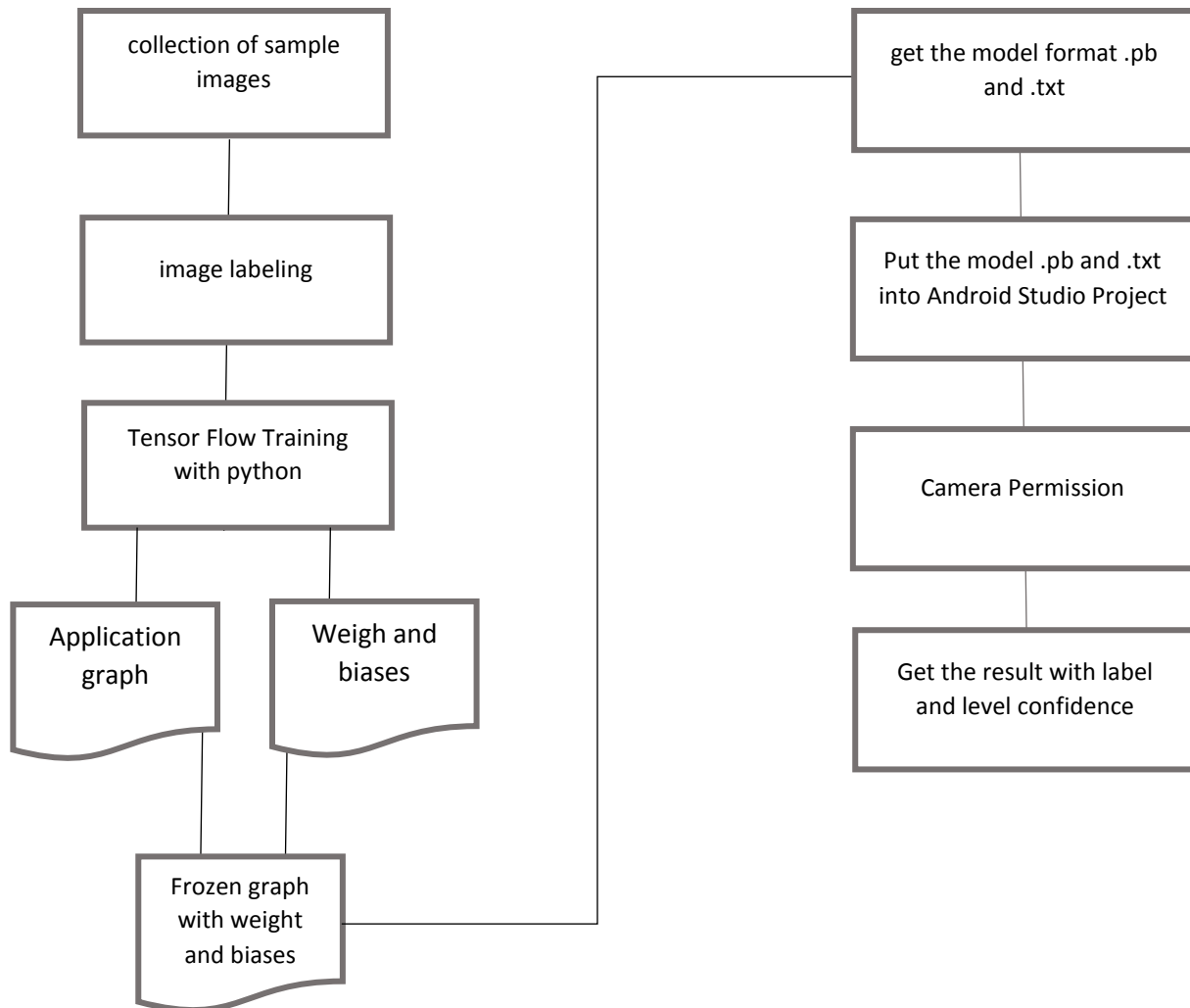
#### a. ESP32 dev

The ESP32 is the ESP8266 successor loaded with lots of new features. The ESP32 is a development board that combines Wi-Fi and Bluetooth wireless capabilities, and it's dual core. It is one of the best solutions for DIY Internet of Things Projects and DIY Smart Home Projects.

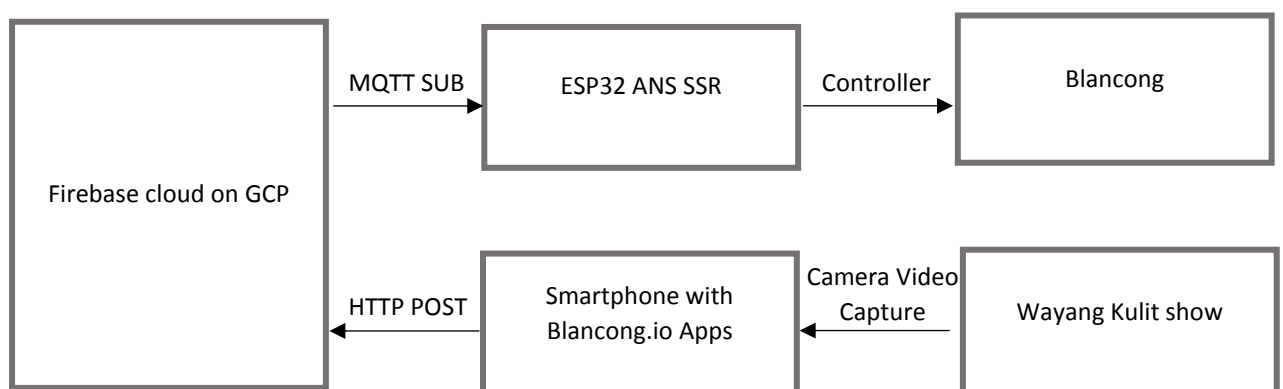
b. SSR(Solid State Relay)

A solid-state relay (SSR) is an electronic switching device that switches on or off when a small external voltage is applied across its control terminals. SSRs consist of a sensor which responds to an appropriate input (control signal), a solid-state electronic switching device which switches power to the load circuitry, and a coupling mechanism to enable the control signal to activate this switch without mechanical parts.

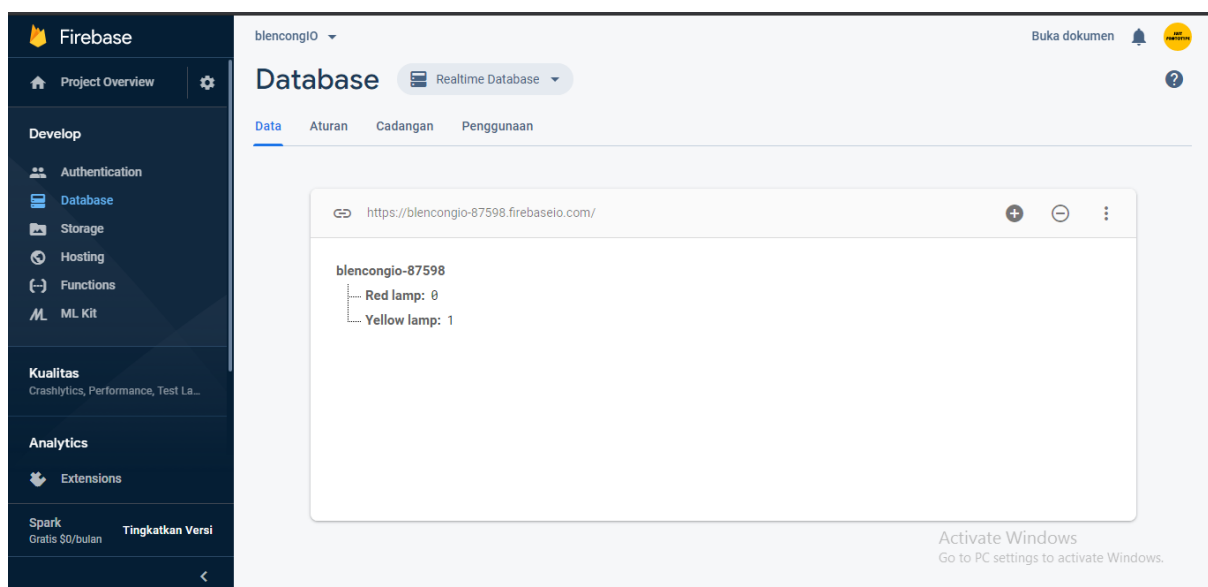
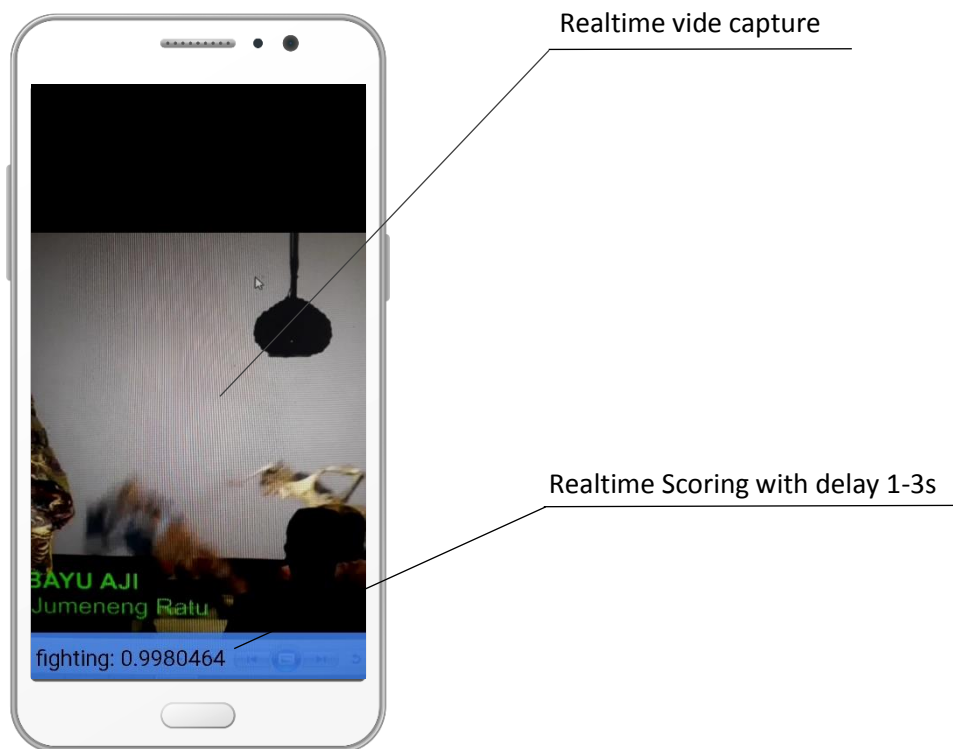
## BACKEND ARCHITECTURE



## HARDWARE ARCHITECTURE



## SOFTWARE INTERFACE



## TEST RESULT

Total Current sample is 27 item for fighting category and 349 item for normal category with 500 Step of Training process . The more samples the more accurate the model is produced

```
C:\Windows\system32\cmd.exe
INFO:tensorflow:2020-01-16 07:59:13.855467: Step 430: Train accuracy = 100.0%
INFO:tensorflow:2020-01-16 07:59:13.856483: Step 430: Cross entropy = 0.061516
INFO:tensorflow:2020-01-16 07:59:14.253489: Step 430: Validation accuracy = 63.0%
% (N=100)
INFO:tensorflow:2020-01-16 07:59:18.404727: Step 440: Train accuracy = 99.0%
INFO:tensorflow:2020-01-16 07:59:18.405726: Step 440: Cross entropy = 0.078361
INFO:tensorflow:2020-01-16 07:59:18.812750: Step 440: Validation accuracy = 62.0%
% (N=100)
INFO:tensorflow:2020-01-16 07:59:22.930983: Step 450: Train accuracy = 100.0%
INFO:tensorflow:2020-01-16 07:59:22.930983: Step 450: Cross entropy = 0.064882
INFO:tensorflow:2020-01-16 07:59:23.347007: Step 450: Validation accuracy = 80.0%
% (N=100)
INFO:tensorflow:2020-01-16 07:59:27.337237: Step 460: Train accuracy = 100.0%
INFO:tensorflow:2020-01-16 07:59:27.338252: Step 460: Cross entropy = 0.069140
INFO:tensorflow:2020-01-16 07:59:27.750260: Step 460: Validation accuracy = 66.0%
% (N=100)
INFO:tensorflow:2020-01-16 07:59:31.930647: Step 470: Train accuracy = 100.0%
INFO:tensorflow:2020-01-16 07:59:31.930647: Step 470: Cross entropy = 0.068618
INFO:tensorflow:2020-01-16 07:59:32.341670: Step 470: Validation accuracy = 61.0%
% (N=100)
INFO:tensorflow:2020-01-16 07:59:36.409903: Step 480: Train accuracy = 99.0%
INFO:tensorflow:2020-01-16 07:59:36.409903: Step 480: Cross entropy = 0.071106
INFO:tensorflow:2020-01-16 07:59:36.826926: Step 480: Validation accuracy = 53.0%
% (N=100)
INFO:tensorflow:2020-01-16 07:59:40.941161: Step 490: Train accuracy = 100.0%
INFO:tensorflow:2020-01-16 07:59:40.942161: Step 490: Cross entropy = 0.066124
INFO:tensorflow:2020-01-16 07:59:41.351184: Step 490: Validation accuracy = 67.0%
% (N=100)
INFO:tensorflow:2020-01-16 07:59:45.037396: Step 499: Train accuracy = 100.0%
INFO:tensorflow:2020-01-16 07:59:45.038397: Step 499: Cross entropy = 0.057889
INFO:tensorflow:2020-01-16 07:59:45.440417: Step 499: Validation accuracy = 84.0%
% (N=100)
running testing . . .
INFO:tensorflow:Final test accuracy = 100.0% (N=38)
writing trained graph and labbels with weights
INFO:tensorflow:Froze 2 variables.
INFO:tensorflow:Converted 2 variables to const ops.
done !!
D:\Blencong Training Model>
```

Note : The Final Test Accuracy is 100.0%.

## LINK AND DOCUMENTATION

1. Files for training models(still in the process of uploading. file size around 700MB)  
<https://drive.google.com/file/d/1FFEjGxzSXx-pMKIEbA0rd2vXsBhhHP6q/view?usp=sharing>
2. Github Repository(guide to training models)  
<https://github.com/helloaltop/blencong.io>
3. Github Repo for Android Apps Sourcode  
<https://github.com/justprototype/Blencong.io>
4. Link to Download APK Apps  
<https://drive.google.com/open?id=1c-C3k-c8UTC9Z7Z0m4uvUoyPB4Fin1hd>