# أكاديمية سدايا
# SDAIA Academy

# Signatures verification System

## T5 Data Science Bootcamp
## BY

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MRS | Make robust solution

# I. Introduction

Using handwritten signatures to verify identity can be challenging when there are skilled forgeries, where a person's signature is compromised and a forger intentionally tries to imitate it, We are created signature verification systems by using deep learning model that can identify fraud cases in individual signatures, to prevent document fraud in financial, legal, and commercial settings.

# II. Data Overview

We have 1021 files containing Real and forge signature for 69 person.

**Data source:**

Kaggle

## Data Exploring



# III. Models intro: Preprocess

- Image resize
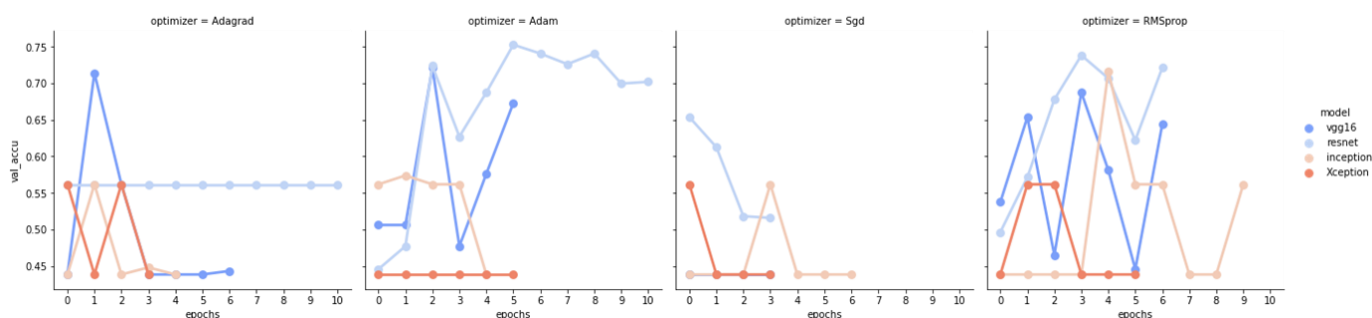- Reshape
- Normalize
- Convert color

## Models Intro

| Model | VGG 16 | Inception-V3 | Xception | ResNet-50 |
|---|---|---|---|---|
| Optimizers | SGD ,ADAM ,RMSprop , Adgrad | | | |
| Epochs/Batch size | Epoch 20 and BS 64 | | | |

## **Models Details**

- Phase 1
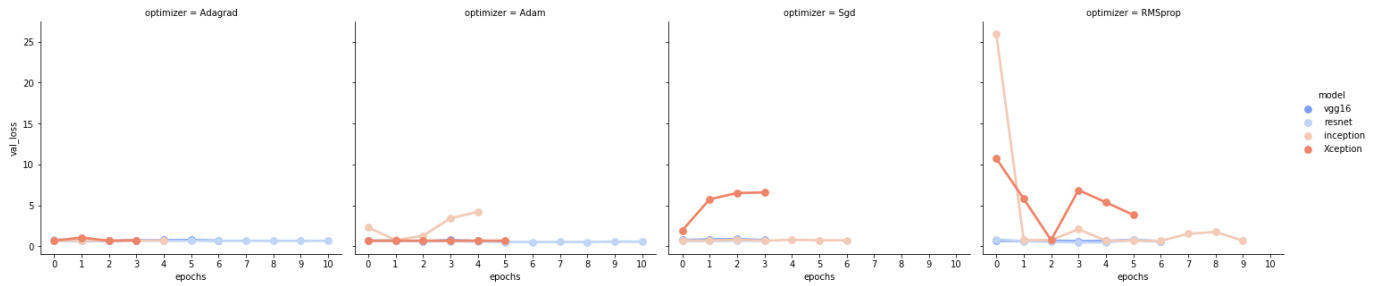
With freezing

- Phase 2

Without freezing

## Phase 1: Frozen layers



Validation Accuracy of Pre-trained Models (frozen layers).
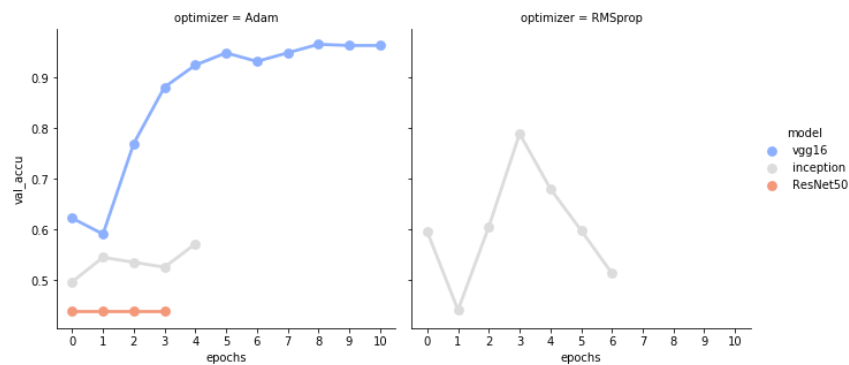
## Phase 1: Frozen layers

Validation Loss of Pre-trained Models(frozen layers)
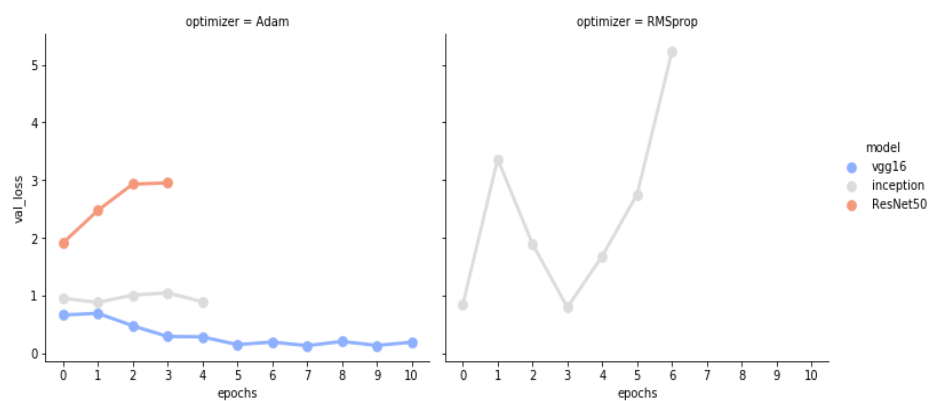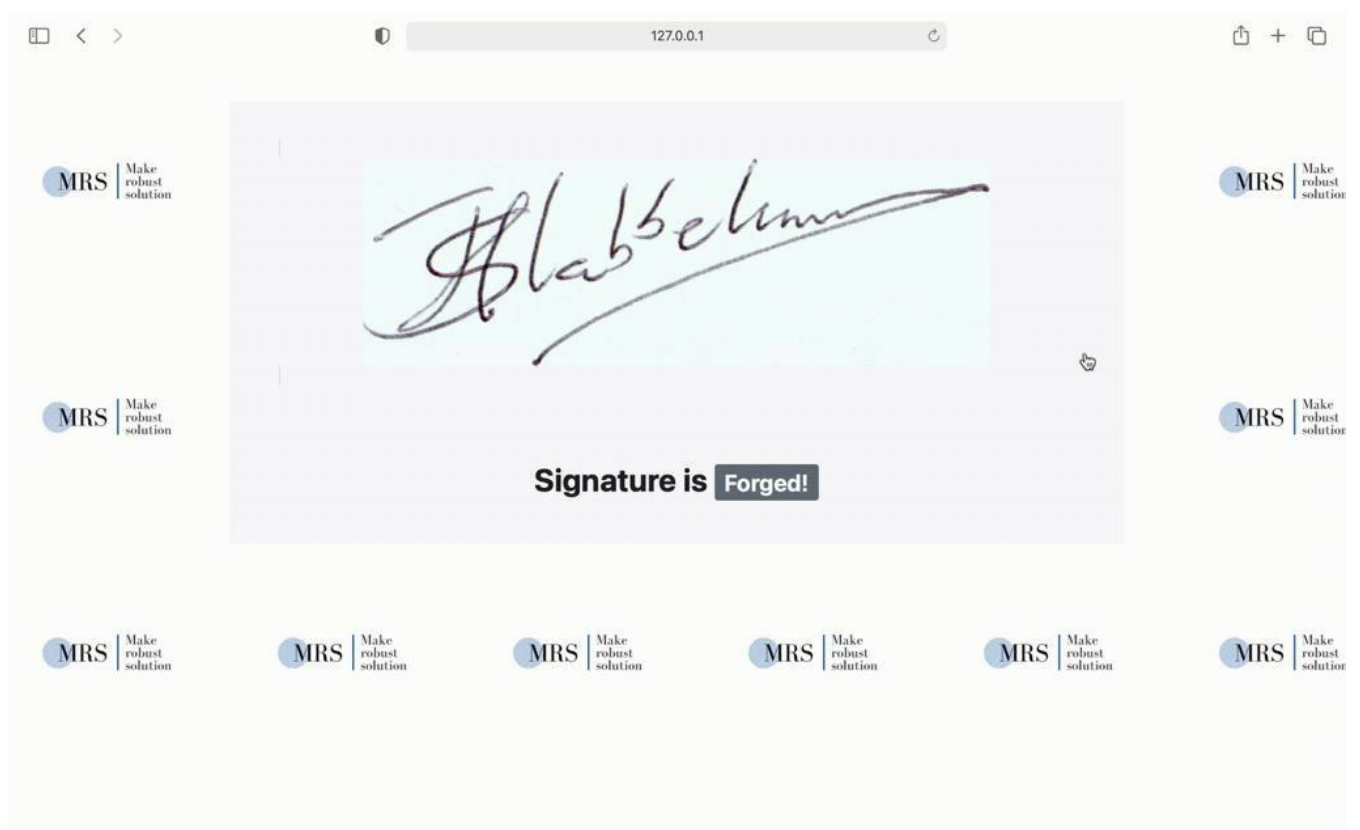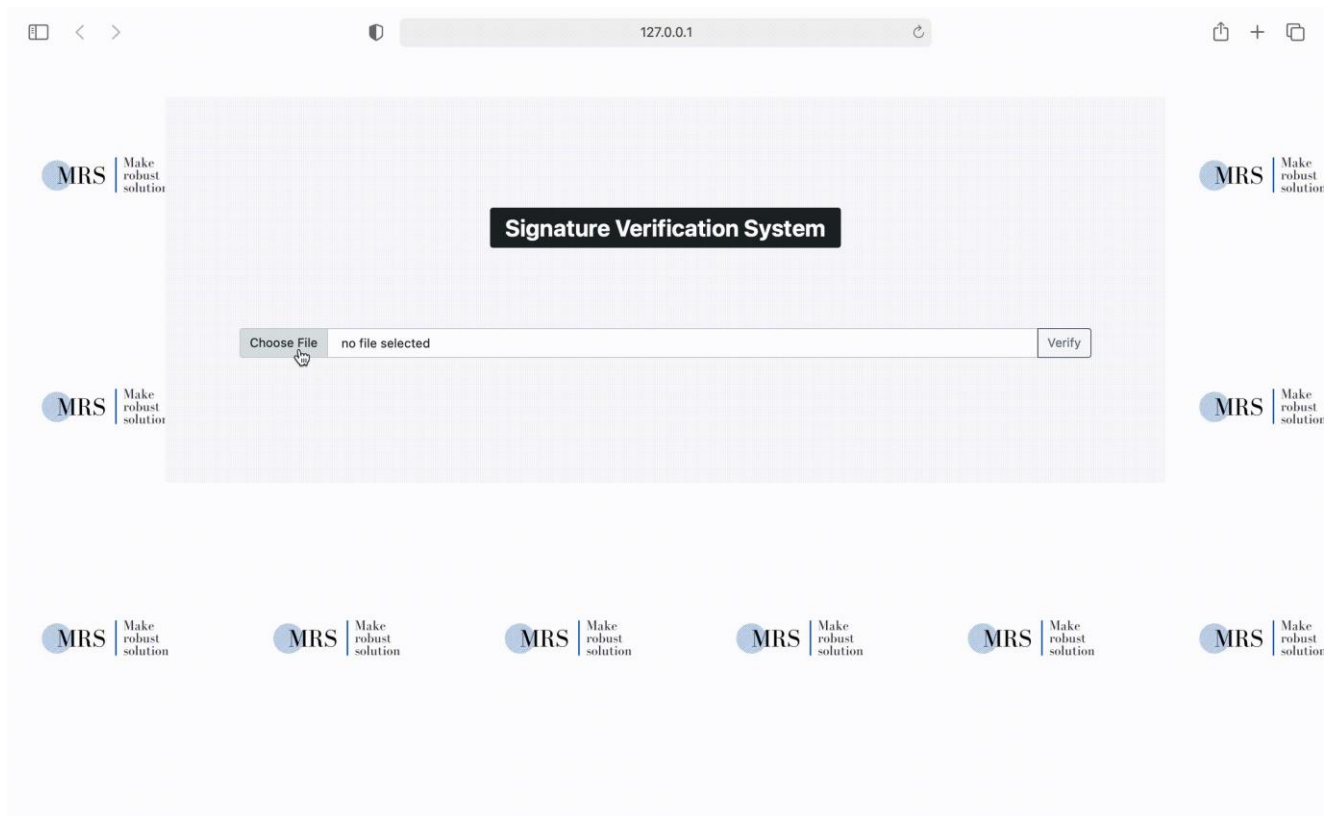


# Phase 2: Unfrozen layers

Validation Accuracy of Pre-trained Models (Un-frozen layers).



Validation Loss of Pre-trained Models (Un-frozen layers)



# IV.    <u>Deployment:</u>

**Signature Verification System**

Choose File | no file selected | Verify

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**Signature is** Forged!

## VII.  Tools

 **VsCode, TensorFlow, Keras, Flask, Colab, Opencv**

## VIII. Future work

- **Handle pdf file with pictures**
- **Expand the system to contain Government stamp**
- **On-time Signatures Verfication**

## Conclusion

This product will help to save time and effort on employees in companies, institutions banks, to authenticate papers and verify signatures and Increase the accuracy rate, as the device has a low probability of error.

## Reference

https://www.kaggle.com/eryash15/re-arranged-data