

Team 4 Classification Project

Jaiden, Keegan, Kevin

AIIE 2025

Dataset:

<https://www.kaggle.com/datasets/jaidenroman/rps-team-4>

Training:

416 Images of rock

560 Images of paper

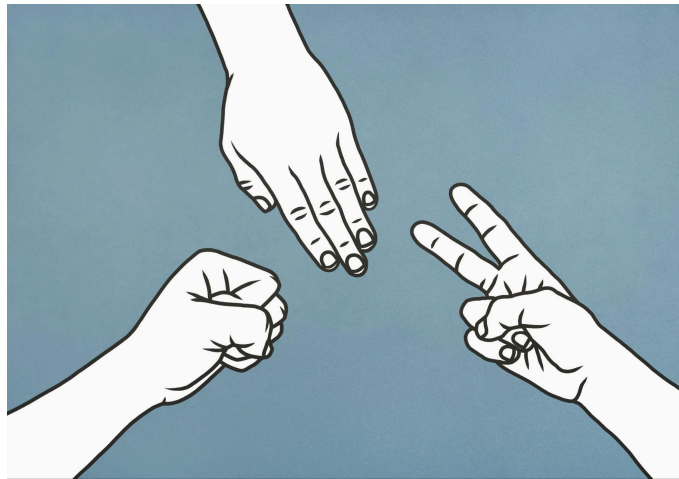
508 Images of scissors

Testing:

116 Images of rock

127 Images of paper

34 Images of scissors



Our images were standardized to a size of 300x200. We collected our training and test data by combining datasets from kaggle and images we took in class, splitting them between our test data and training data manually. This was done to ensure a wide variety of backgrounds and positions were used to train our data, so that the program would get used to the hand signs in front of different locations and at different angles. Listed below is the evolution of our program's accuracy as we changed around the parameters.

For our dataset, we took multiple rock-paper-scissor datasets from Kaggle, adjusted all of the images to 300x200, and combined all of those images into one dataset. This is the route we chose since most of the rock-paper-scissor datasets available had low variance with their images, which can inaccurately train an AI model. To add even more variance, we went around

the room and asked our colleagues for photos of them holding each of the three symbols, and added those to our dataset as well. We've been continuously expanding the library of photos as we test our model more, to ensure variety within our training data for better model performance.

Model Evolution:

Epoch	Layers	Activation	Accuracy
5	3	relu > softmax	59%
6	4	relu > softmax	66%
5	5	relu > softmax	78%
6	5	relu > softmax	85%
20	5	relu > softmax	76%
30	6	relu > softmax	82%
6	6	relu > softmax	69%
50	6	relu > softmax	90%

Our resulting program, however, had a hard time distinguishing between paper and scissors, even as we increased the epoch and made changes to our layers. Thus, we searched for more rock, paper, and scissors images to increase our training data set.

Updated Dataset:

<https://www.kaggle.com/datasets/jaidenroman/team-4-rockpaperscissors>

Training:

636 Images of rock

685 Images of paper

695 Images of scissors



Testing:

116 Images of rock

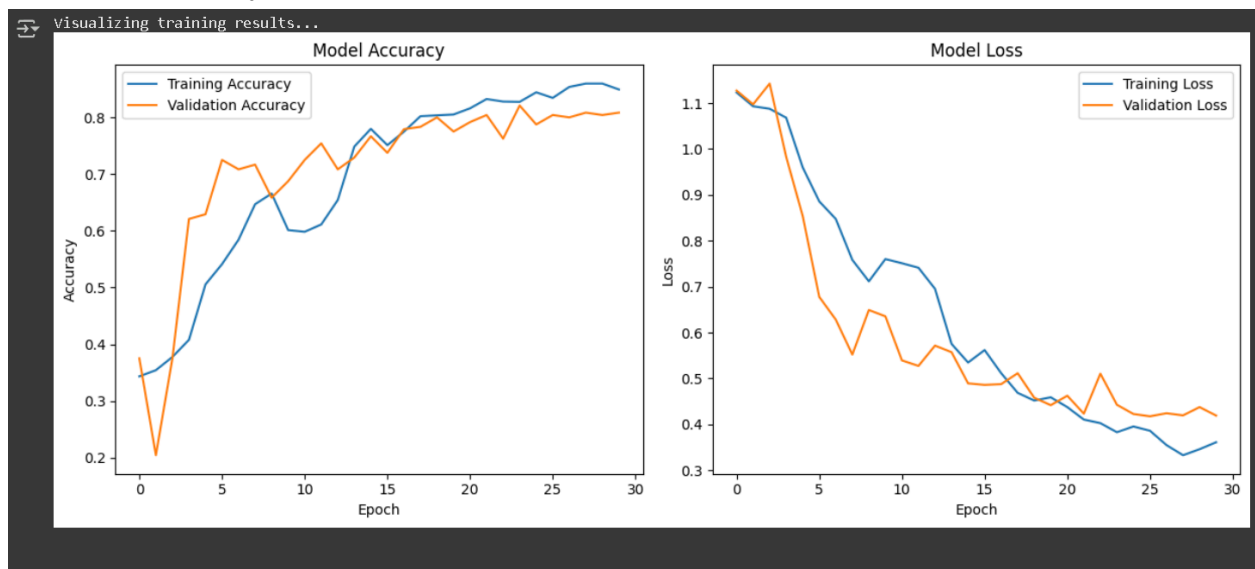
90 Images of paper

34 Images of scissor

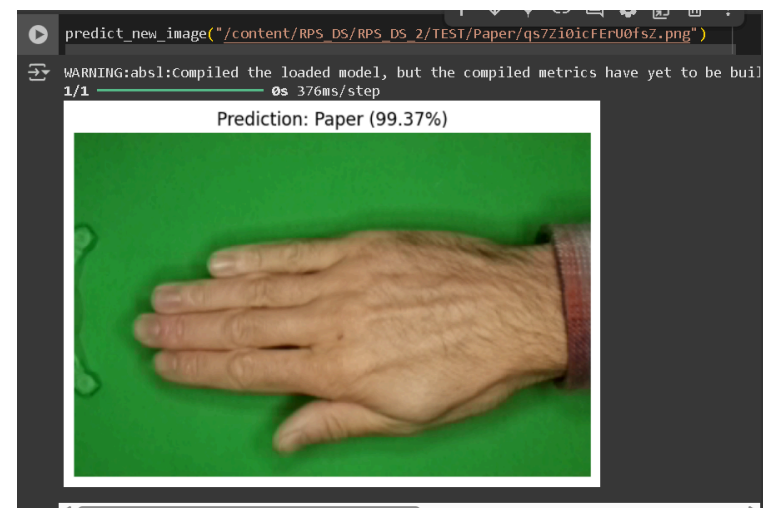
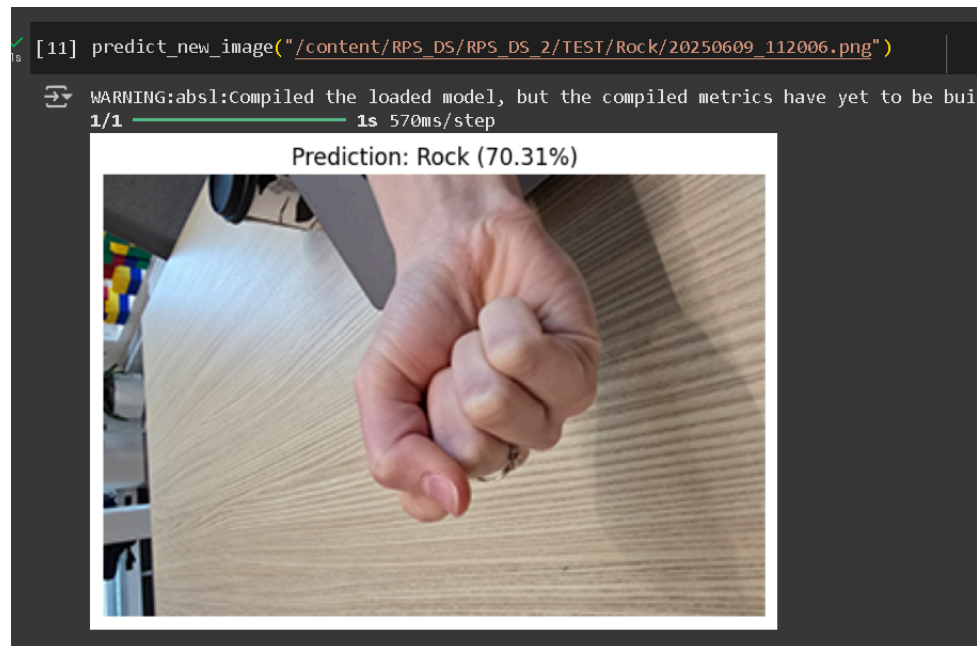
Model Evolution:

Epoch	Layers	Activation	Accuracy
15	6	relu > softmax	71%
30	5	relu > softmax	87%
6	4	relu > softmax	63.03%
5	6	relu > softmax	63%
15	6	elu > softmax	71%
30	5	leaky_relu > softmax	84%
30	6	elu > softmax	
15	5	tanh > softmax	

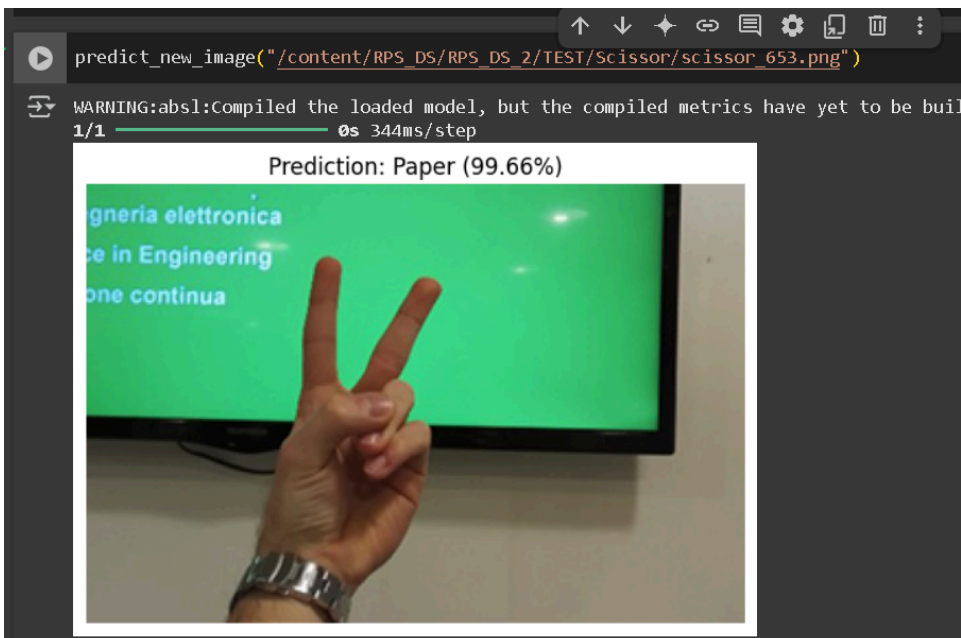
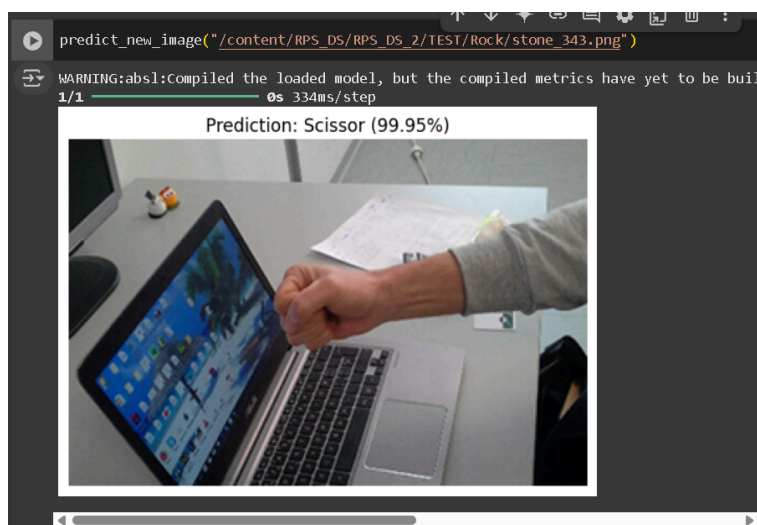
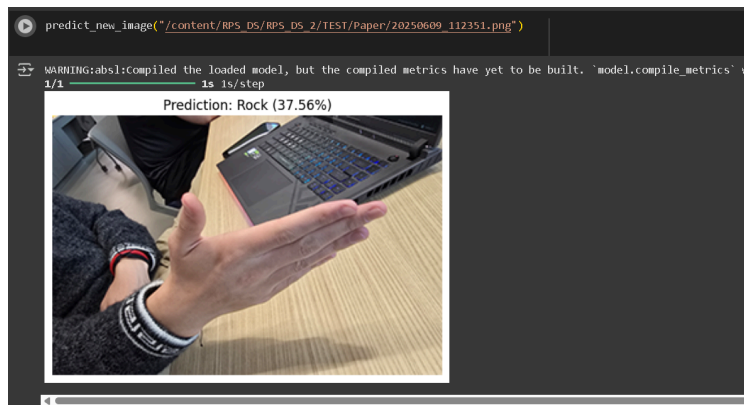
Plot of our accuracy (87%):



Examples of tests that passed:



Examples of tests that failed:



Imports:

```
import kagglehub
import shutil
import os
import tensorflow as tf
import matplotlib.pyplot as plt
import numpy as np
from PIL import Image, ImageOps
from tensorflow.keras.models import Sequential, load_model
from tensorflow.keras.preprocessing.image import ImageDataGenerator
```