

Rock, Paper and Scissors Image Classification

Alessandro Bottoni

January 29, 2026

1 Introduction

The following project aims at developing a Convolutional Neural Network capable of recognizing rock, paper and scissors hand gestures.

2 Dataset

The dataset is composed of 2189 pictures in a .png format and divided in three classes: 1. Rock, with 726 pictures. 2. Paper, with 712 pictures. 3. Scissors, with 750 pictures.

3 Preprocessing and Data Augmentation

4 Train/Validation/Test Split

5 Model and Training

6 Results

7 Discussion and Conclusion

8 Bibliography

1. Understand "stride": <https://medium.com/@bragadeeshs/stride-in-cnns-stepping-towards->
2. Basic tutorials for inspiration: what is torch.nn?: <https://docs.pytorch.org/tutorials/>
3. Basic tutorials for inspiration: training a Neural Network: https://docs.pytorch.org/tutorials/beginner/basics/buildmodel_tutorial.html
4. Basic tutorials for inspiration: training an image classifier: https://docs.pytorch.org/tutorials/beginner/blitz/cifar10_tutorial.html
5. Understand conv2d parameters: <https://www.codegenes.net/blog/conv2d-parameter-object-input-pytorch/>
6. hyperparameter fine-tuning with Ray: <https://docs.pytorch.org/tutorials/beginner/>

hyperparameter_tuning_tutorial.html 7. Stochastic Gradient Descent
and Momentum: <https://www.lunartech.ai/blog/mastering-stochastic-gradient-descent-th>

I declare that this material, which I now submit for assessment, is entirely my own work and has not been taken from the work of others, save and to the extent that such work has been cited and acknowledged within the text of my work. I understand that plagiarism, collusion, and copying are grave and serious offences in the university and accept the penalties that would be imposed should I engage in plagiarism, collusion or copying. This assignment, or any part of it, has not been previously submitted by me or any other person for assessment on this or any other course of study.