Personal Reflections on Individual Assignment

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Abstract

This is a personal reflection on the learnings from the individual assignment on deep learning.

**Keywords:** Imaging, Image Processing, Machine Vision, etc. (Maximum ﬁve)

# Introduction

Initially I used code from Hands-on Transfer Learning with Keras and the VGG16 Model [McDermott, 2021] however this turned out to be only give an accuracy of 3.9% when applied to the test data due to not having a separate validation data set and not balancing the data set.

Initially, it was going to take 7 hours per epoch due to not enabling GPU in Google Collab.

Enabling the GPU brought time per epoch down to 7 mins.

ImageDataGenerator(preprocessing\_function=preprocess\_input) reduced time per epoch down to 60secs but also images 64x64

Split training data results in 4.09%

Add class weights #https://stackoverflow.com/questions/41648129/balancing-an-imbalanced-dataset-with-keras-image-generator

Normalization of images <https://machinelearningmastery.com/how-to-normalize-center-and-standardize-images-with-the-imagedatagenerator-in-keras/>

Chart, line chart

Description automatically generated

Chart, line chart

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Switch EarlyStopping to loss

Fine tune to 5

Fine tune to 20 layers

Realised test data had categorical class\_names

Chart, histogram

Description automatically generated

# References

[Brownlee, 2021] Brownlee, J., 2021. *Transfer Learning in Keras with Computer Vision Models*. [online] Machine Learning Mastery. Available at: <https://machinelearningmastery.com/how-to-use-transfer-learning-when-developing-convolutional-neural-network-models/> [Accessed 30 December 2021].

[McDermott, 2021] McDermott, J., 2021. *Hands-on Transfer Learning with Keras and the VGG16 Model*. [online] Learndatasci.com. Available at: <https://www.learndatasci.com/tutorials/hands-on-transfer-learning-keras/> [Accessed 30 December 2021].

https://www.learndatasci.com/tutorials/hands-on-transfer-learning-keras/

<https://www.tensorflow.org/tutorials/images/transfer_learning>

[https://towardsdatahttps://www.learndatasci.com/tutorials/hands-on-transfer-learning-keras/science.com/transfer-learning-with-vgg16-and-keras-50ea161580b4](https://towardsdatascience.com/transfer-learning-with-vgg16-and-keras-50ea161580b4)

Data Generators

https://vijayabhaskar96.medium.com/tutorial-image-classification-with-keras-flow-from-directory-and-generators-95f75ebe5720

<https://arxiv.org/abs/1505.06798>