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| Deep Learning project with Convolutional Neural Networks |
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| Safi CENGİZ |

First; we load dataset fashion\_mnist. And there are 10 outputs classes and we gave each of them names.

Then showed dataset as train and test and number of pictures. Pictures are 28\*28 arrays.

For the model to work properly, these values need to be normalized to the range [0,1]. To perform the conversion we can divide each array by 255.The pixel values across all images range between 0 and 255

The Convolution 2D layers we're going to be using expect a 4 dimensional array (tensor) as input to accommodate the notion of images having channels. In our case, our images are grayscale and therefore only have one channel in the channel dimension. Our data must nonetheless be reshaped to shape (samples, rows, cols, channels).

After plot images,

We built model with ReLU and softmax.

ReLU: Rectified Linear Unit function, an additional step on top of Convolution. The reason why the ReLU is used is “to increase the non-linearity”.

The reason we want to increase non-linearity is because images are highly non-linear, that is why we want to break up linearity.

Softmax:In CNN, after the application of the Softmax Function, is to test the reliability of the model using as Loss Function, in order to maximize the performance of our neural network.

Then we compiled model, cause of increase accurate and loss function + optimize it.

Adam optimizer is really efficient when working with large problem involving a lot of data or parameters. It requires less memory and is efficient.

After compiled the model, we trained it on dataset. With validation split %20 and %30 and epoch are 10 and 15. 2 different model accuracy attached in folder Rplot10 and Rplot15. With additional 5 epoch, accuracy rate increased from %90.84 to %92.25.

Then we used trained model to make prediction, which is corrects are labeled green color while non-corrects labelled red.

This project is based on R language and written on Rstudio. I used keras library, tidyr and ggplot2.

Added only code .rmd and knitted to pdf version,word version and snippets of code. (In pdf version epoch cause errors so some steps missing. Only attached for documentation in case you couldn’t run codes. It didn’t work on Rstudio-cloud)

Searched and checked a lot of projects on Kaggle, I couldn’t find to use my trained model on random photos. And there wasn’t any CNN project to imply photo.

I tried to show you another project to you which is python based but cause of dual-monitor you said its too small then I switched to share only Rstudio and couldn’t show you model prediction accuracy graphs and additional project.

Additional project;

<https://colab.research.google.com/drive/1sY7W7hOrQIl-4NvZZFgaCQKaEvgl8bj2?usp=sharing>

Acurracy graphs;

Rplot10.png

Rplot15.png

Pdf version,word and rmd versions.

And proje1th,proje2nd,proje3th are images of codes.