AI IN ORTHOPAEDICS – MNIST DEMO ZIP ARCHIVE GUIDE

This is a guide to the files in this zip archive. It assumes that you have installed a Python environment to run Jupyter notebooks and have Pytorch installed.

FOLDER GUIDE

There are 3 folders:

data contains the raw data for the demo. The data is the MNIST dataset, a set of handwritten digits in the form of 28x28 png images. There are two folders:

- Train is the data that we use to train the model.
- Test is the test data. We test the model's performance on this data but the model is not allowed to learn from this data.

    Inside each of these folders is also a csv file that says which image represent which digit. The notebook mnist_dataset.ipynb explains this in more detail.

notebooks contains the actual code that you can run to create and train the model. More on this below.

saved_model contains an already trained model. If your computer is painfully slow to train your model, this allows you to bypass that step.

THE NOTEBOOKS

mnist_demo.ipynb – This is **the only notebook** that you need to run. It contains the code to train and test a model and then look at the results.

Linear MNIST model.xlsx – This excel spreadsheet explains the principles of how a linear model and a convolutional model run. It shows why we use convolution and how it works. It aims to be more or less self-explanatory but Excel was never really meant as a presentation tool!

mnist_dataset.ipynb – This is a notebook that walks you through how we take the raw data in the *data* folder and turn it into something that the model recognises. You don't need to run this to train the model but, if you ever want to use your own data, this would be a really useful starting point.

mnist_dataset.py – This is a python script with the same code as *mnist_dataset.ipynb.* It shows how python scripts are structured. It also allows the mnist_dataset to be imported into the *mnist_demo* notebook. Again, no need to run this but we do need to have it for the *mnist_demo.ipynb* notebook to run.

mnist_simple_linear.ipynb – This is a linear model, rather than a convolutional model. It is mainly a stripped down version of the *mnist_demo.ipynb* notebook and it substitutes the convolution model for the much simpler linear model.

prepare_data.ipynb – Again no need to run this. This is the code that was used to generate all of the data is the *data* folder. It may be helpful for reference.