

Final Programming Exam. (part 2)

Deep Learning, 2022

2. Given a dataset1 located at:

<https://drive.google.com/drive/folders/1HWQPgyuMr1Uklfq0-k6mxLak43QO9t13?usp=sharing>

There are 4 file holders in dataset1 containing images of 4 different animals including zebra, rhino, elephant, and buffalo, respectively. Please design a convolutional neural network to classify the animals in every image. No testing data will be given for your testing of the designed neural network. Instead, your designed neural network will be tested with another set of reserved images that are going to be put into the file holder named “test1”. For now, no images are in this file holder. Please write a source code named “test_animal.py” to test your trained neural network. Note that the testing file “test_animal.py” needs to load your trained neural network model named “animal.h5” and also read the images that are going to be put in the file holder named “test1”.

Verify your testing file “test_animal.py” is extremely important because if you fail to write a good testing file, your effort of designing neural networks for training will be in vain. Please carefully test on your testing file “test_animal.py”.

Describe the details and structures of the convolutional neural network you have designed. Put all the details into the file named “report1.pdf”. Please also draw a figure showing convergence of learning errors and put this error convergence figure into the file “report1.pdf” along with your design details. Please submit the following files: (1) the report file “report1.pdf”, (2) the file “animal.h5” containing your neural network model, (3) the testing file “test_animal.py” that load neural network model contained in “animal.h5” and read the images for testing in the file holder named “test1”, (4) the file “animal_source.pdf” containing your source code. (30%)

3. Given a dataset2 located at:

https://drive.google.com/drive/folders/13637l07H5-tLBqagG_UtPln_IaAPdeEH?usp=sharing

There are 4 file holders in dataset2 containing images for 4 different types of vibrational signals named type1, type2, type3, and type4, respectively. Please design a convolutional neural network to classify 4 different types of vibrational signals in every image. No testing data will be given for your testing of the designed neural network. Instead, your designed neural network will be tested with another set of reserved images that are going to be put into the file holder named “test2”. For now, no images are in this file holder. Please write a source code named “test_vbn.py” to test your trained neural network. Note that the testing file “test_vbn.py” needs to load

your trained neural network model named “vbn.h5” and also read the images that are going to be put in the file holder named “test2”.

Verify your testing file “test_vbn.py” is extremely important because if you fail to write a correct testing file, your effort of designing neural networks for training will be in vain. Please carefully test on your testing file “test_vbn.py”.

Describe the details and structures of the convolutional neural network you have designed. Put all the details into the file named “report2.pdf”. Please also draw a figure showing convergence of learning errors and put this error convergence figure into the file “report2.pdf” along with your design details. Please submit the following files: (1) the report file “report2.pdf”, (2) the file “vbn.h5” containing your neural network model, (3) the testing file “test_vbn.py” that load neural network model contained in “vbn.h5” and read the images for testing in the file holder named “test2”, (4) the file “vbn_source.pdf” containing your source code. (30%)

Please follow the requirements in every problem and submit totally 8 files. Do not compress your submitted files. Email me to the address ltyao@ntut.edu.tw by 15:00, June 26, 2022. No late submission is accepted.