NATURAL SCENE CLASSIFICATION USING CONVOLUTIONAL NEURAL NETWORKS

User manual

Initial setup

Python 3 is the requirement for running this project. In order to run this, it should be installed in some form be the OS Linux, Windows or Mac. Certain packages must be installed for the code to run. To get these libraries,

For linux machines-

sudo apt-get install python3-numpy

sudo apt-get install python3-pickle

sudo apt-get install python3-pillow

sudo apt-get install python3-Gzip

sudo apt-get install python3-theano

sudo apt-get install python3-tkinter

sudo apt-get install python3-imaging-toolkit

sudo apt-get install python3-importlib

Type these statements one after the other in the terminal and run them error free

For Windows machines-

Install these packages using pip command

pip numpy

pip pickle

pip pillow

pip gzip

pip theano

pip tkinter

pip importlib

Designing the model file

All the parameters of the convolutional neural network should be set according to the image dataset and application of the network in a file named Scenes.prms .

For example:

```
{
"layers" : [
      ('ElasticLayer', {


         }),
      ('ConvLayer', {
         'num_maps'     :6,
         'filter_sz'    :3,
         'stride'       :1,
         'actvn'        :"relu50",
         }),
      ('PoolLayer', {
         'pool_sz'      :2,
         }),
      ('ConvLayer', {
         'num_maps'     :20,
         'filter_sz'    :3,
         'stride'       :1,
         'actvn'        :"relu10",
         }),
      ('PoolLayer', {
         'pool_sz'      :2,
         }),
```

```
        ('HiddenLayer', {
            'n_out'        :10,
            'pdrop'        :.001,
            'reg'          : {'L2':.0001, 'maxnorm':0},
            }),
        ('SoftmaxLayer', {
            'n_out'        :4,
            'reg'          : {'L2':.001, 'maxnorm':0},
            }),
    ],

    "training_params" : {
        'BATCH_SZ'   :20,
        'NUM_EPOCHS' : 10,

        'EPOCHS_TO_TEST' : 1,
        'TEST_SAMP_SZ': 300,

        'INIT_LEARNING_RATE': .00001,
        'EPOCHS_TO_HALF_RATE':  1,
    },
    }
```

Running the CNN

The architecture CNN model is now ready to be run.

For Linux machines-

Open terminal

Get to the directory the train.py file is saved at using cd directory/…/

Type and run the train.py file using python3 train.py

For Windows machines-

Double click on train.py to run it