Classify Music using Artificial Neural Network

1.0 About

This project is to classify music files (mp3) using Neural network. This uses the in-density values of small part of the music file as input and classify music in to two groups (Rock and Classic).

2.0 Implementation

First the music file is converted in to ".aif " format. This is be cause that format uses no compression and it can give the row sound data. Then a 400x400 image is created by normalizing the data taken from the middle of the converted file in to 0 – 256 range. Then a histogram is made using this image. Then the histogram is normalize again to get 10 inputs (summing pixel counts of 25 in-density values and make it a value between 0.0 – 1.0 by dividing it by the maximum value of the 10 values). Then this inputs are used in Neural network to train.

Figure 2.1 I Example image created from music file

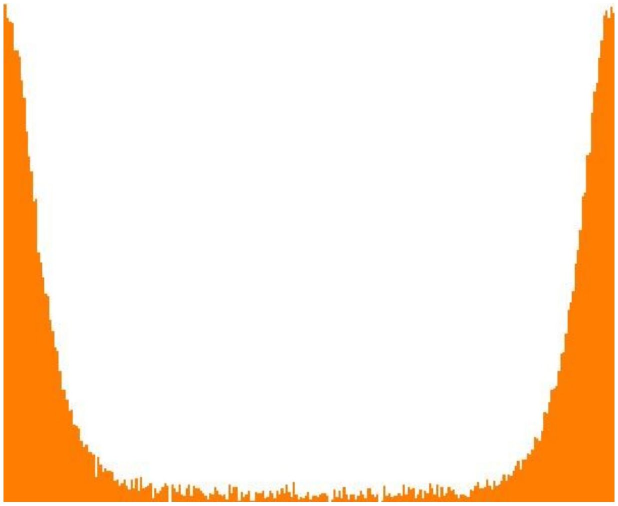

Figure 2.2 Example Histogram

3.0 Pre-Requirements

- Linux
- python 2.7
- pySide
- pyQt
- ffmpeg (a program, not a library)

'ffmpeg' is a program used to convert media files use,

```
sudo apt-get install ffmpeg
```

command to install it. Python, pyside and pyqt canbe installed using synaptic package manager in Linux or using terminal window.

4.0 Running the Application

4.1 Training

First make set of folders named as in 'training_testing',

rock
rock_img
classic
classic_img

Then use,

```
ffmpeg -i input.mp3 output.aif
```

for each music file using to train (mp3) to convert all mp3 files in to .aif format and add them in to rock, classic, and folders. Then run 'make_img.py' in 'training_testing' folder using,

```
python make_img.py
```

Then the images will be created. Then first run 'train.py' to train the network.

```
python train.py
```

Train it until the error gets very low. The script will save weights of the neural network in a file named 'weights' when the given number of iterations are finished. You can load and save weights file when ever you are training.

Already trained 'weights' file are included in the source folder.

4.1 Running Classifier Program

Copy weights file form 'training_testing' folder in to 'classifier ' folder and run 'classifer.py'

```
python classifier.py
```

Then choose a mp3 file using browse button and press convert. Then wait few seconds until the file converts to '.aif' format. After conversion the program will give a message box saying "done!!!". then use the 'classify' button to classify.

5.0 Result

20 files for each category to train the neural network and 10 files for each category is used for testing. It gives a total error of 5 % as the result .

6.0 More Information

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