On this page, you can download a C++ implementation of the phase split layers as described in [1], using Caffe [2]. Caffe is a deep learning framework made with expression, speed, and modularity in mind. It is developed by the Berkeley Vision and Learning Center (BVLC) and by the community contributors.

What it contained:

1. C++/CUDA implementation and unit test of the phase split layer.

split\_by\_phase\_layer.cpp

split\_by\_phase\_layer.cu

split\_by\_phase\_layer.hpp

test\_split\_by\_phase\_layer.cpp

C. Choy wrote a very good blog on step-by-step to make the python layer [3]. Please refer to it.

1. Sample CNN model prototxt file for modeling PSRM sub-models as described in [1].

phase\_aware\_net\_train.prototxt

*phase\_aware\_net\_solver.prototxt*

A full IPython notebook examples of creating database, training the net, refining batch normalization moment, and testing the net are listed as follows.

* PhaseAwareNet.ipynb is the IPython notebook examples.
* AugStegoDataLayer.py is a python data layer that you put it into the folder {Caffe Folder}/examples/pycaffe/Layers.

This function basically create the image batches for VNet, it involves reading the images, randomly packing the synchronized cover/stego data, augmenting the database, etc

* HG\_IMDB\_JUNI04\_Create.ipynb, it is a python notebook to create the training and validation images list files, train.txt and test.txt, which are the input to the AugStegoDataLayer.py.

Note: This script run on directly reading jpeg images using "matplotlib.image.imread", not through jpeg\_read(). I found that there is around 1% performance loss. If you want to run it with jpeg\_read() and you have enough disk space, you can use jpeg\_read() read all the jpeg images and save them into mat file, and use scipy.io.loadmat inside the AugStegoDataLayer.py.

REFERENCES

[1] JPEG-Phase-Aware Convolutional Neural Network for Steganalysis of JPEG Images, with Mo Chen, M. Boroumand, and V. Sedighi, 5th IH&MMSec. Workshop, Philadelphia, PA, June 20-22, 2017.

[2] Y. Jia, E. Shelhamer, J. Donahue, S. Karayev, J. Long, R. B. Girshick, S. Guadarrama, and T. Darrell, *Caffe: Convolutional architecture for fast feature embedding*. CoRR, abs/1408.5093, 2014.

### [3] Chris Choy, “Making a Caffe Layer”, https://chrischoy.github.io/research/making-caffe-layer/