GBRAS_SW

Is a software for steganalysis in the spatial domain

User manual

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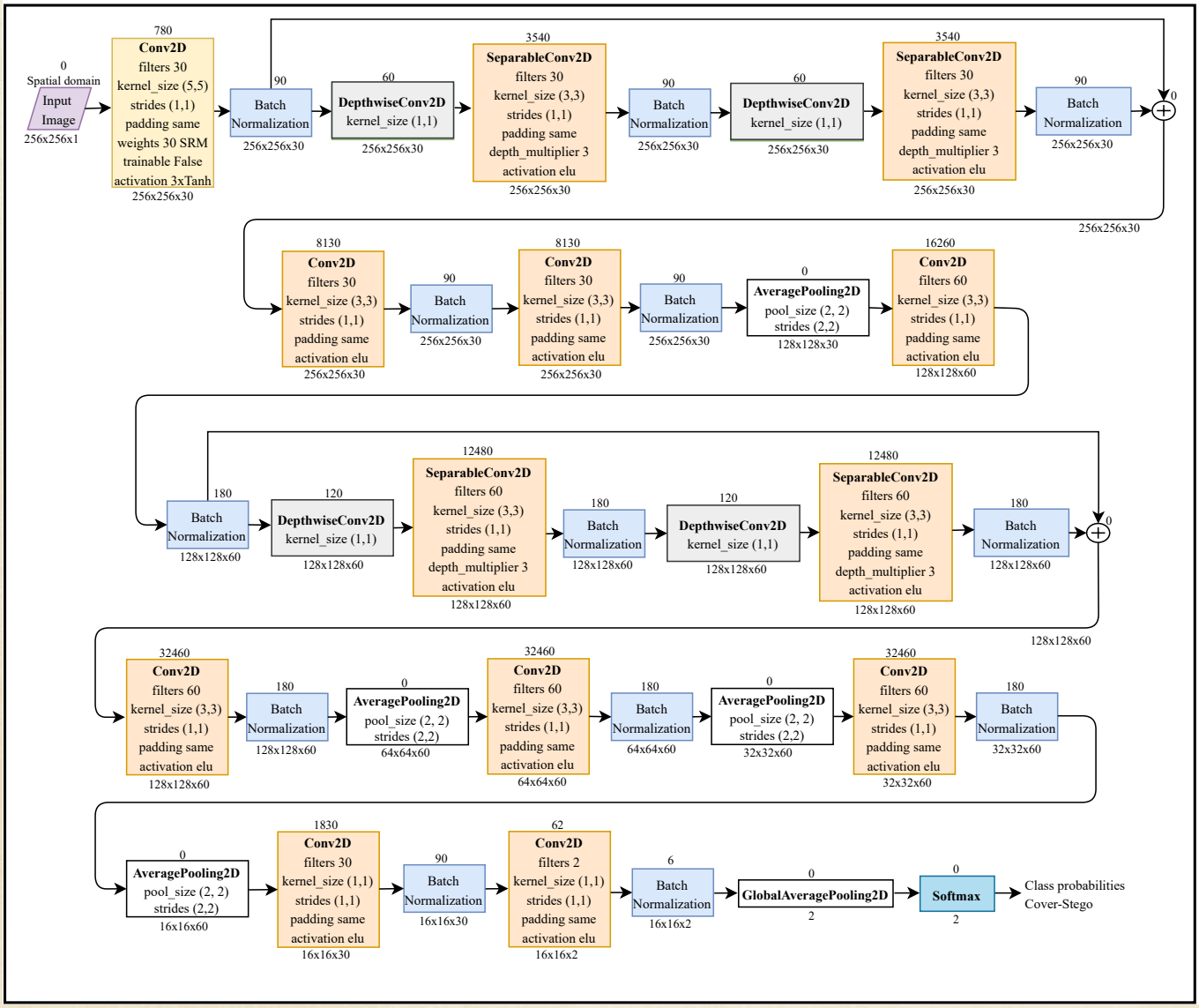

Figure 1: GBRAS-Net convolutional neural network based [1]

GBRAS_SW

GBRAS_SW is a software for the detection of steganographic images in the spatial domain. An in-depth explanation of GBRAS_SW can be found in [1]. GBRAS_SW is a good software for the prediction of steganographic images. The convolutional neural network of this software is shown in **Figure 1**. This software for preprocessing stage maintain the 30 SRM filters (see **Figure 2**) and has a 3xTanH activation function. GBRAS_SW uses the ELU activation function in all feature extraction convolutions. GBRAS_SW uses shortcuts for feature extraction and separable and depthwise convolutions. This software does not use fully connected layers; the network uses a softmax directly after global average pooling.

Prerequisites

The GBRAS_SW requires the following libraries and frameworks:

TensorFlow
numPy
OpenCV
argparse
glob
XlsxWriter
os
datetime

GBRAS-SW was developed in the Python3 (3.8) programming language.

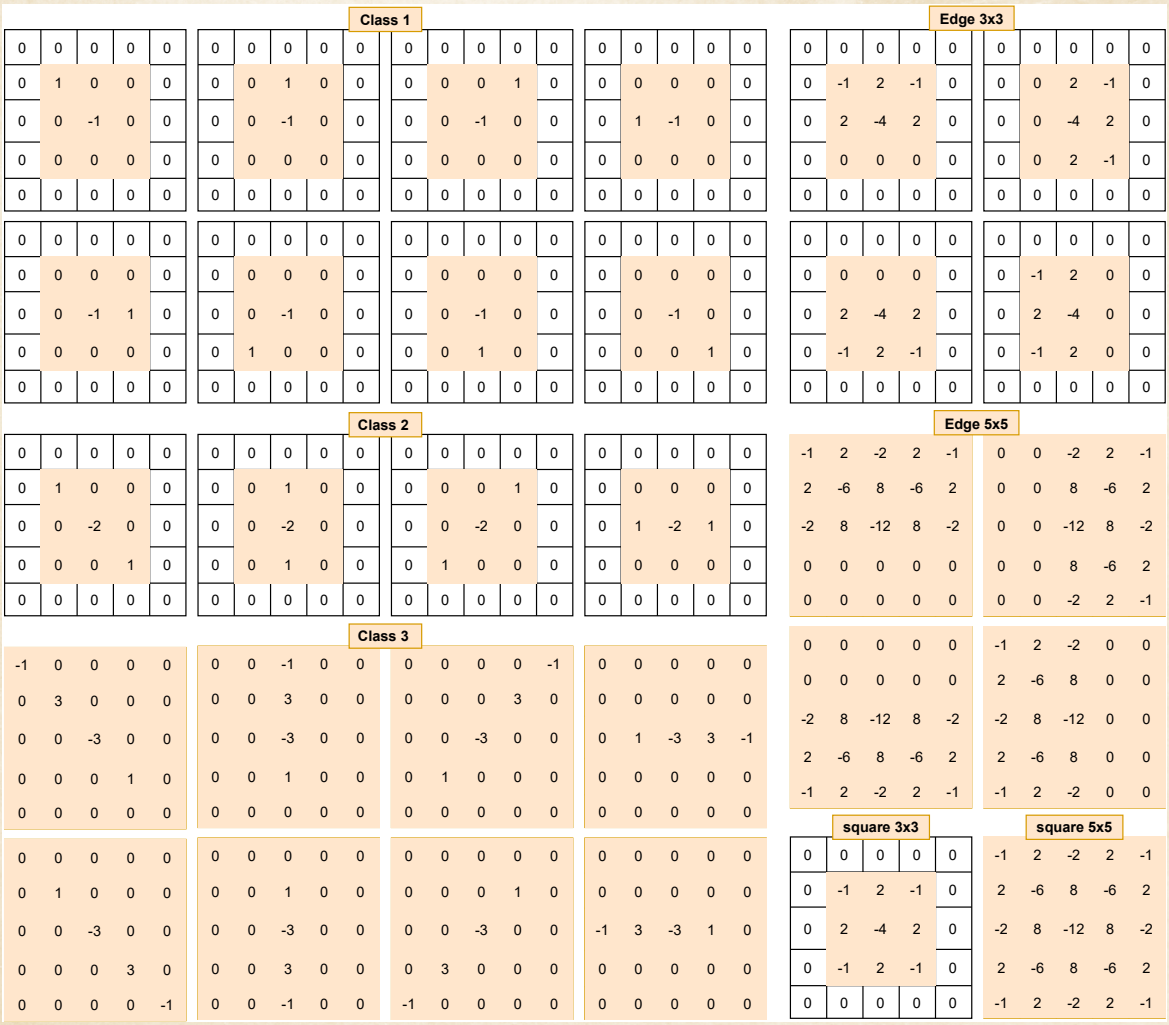

Figure 2: 30 SRM based[1]

Installation

We highly recommend to use and install Python packages within an Anaconda enviroment. To create, execute the command below:

conda create –name GBRAS_SW python=3.8

So, activate it:

conda activate GBRAS_SW

installed the framework:

conda install -c anaconda keras-gpu==2.4.3

Now, install the libraries:

pip install opencv-python
pip install scikit-image
conda install -c conda-forge argparse
conda install -c conda-forge xlsxwriter
conda install -c jmcmurray os
conda install -c trentonoliphant datetime

GBRAS_SW execution

After installing all the prerequisites, you must clone the repository of the current version of GBRAS_SW using.

git clone https://github.com/BioAITeam/GBRAS_SW.git

Then you might run as following:

python GBRAS_SW.py -i ./images -m ./models/S-UNIWARD_0.4bpp.hdf5

In the repository, there are two folders, one with images and the other with models. The images folder contains eighty cover and stego images for testing the software. Can add more images to the folder to test the software's accuracy in detecting cover and stego image in the spatial domain. The format of the images is Portable Gray Map (PGM). In the model folder, there are four models S_UNIWARD and WOW, with two payloads, 0.4 and 0.2 bpp, respectively. Can choose any of the four models to perform a cover or stego image prediction, Example:

python GBRAS_SW.py -i ./images -m ./models/WOW_0.4bpp.hdf5

Authors

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References

[1] T. -S. Reinel et al., "GBRAS-Net: A Convolutional Neural Network Architecture for Spatial Image Steganalysis," in IEEE Access, vol. 9, pp. 14340-14350, 2021, doi: 10.1109/ACCESS.2021.3052494.

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