A Pytorch Implementation of HED for Document Detection

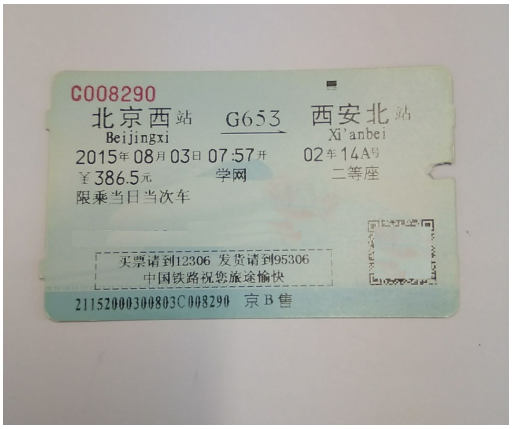
Introduction

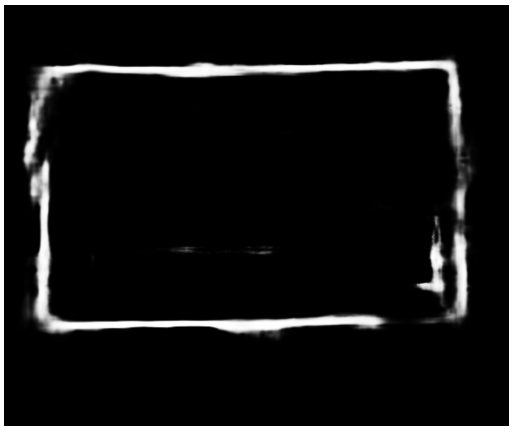
This project is a Pytorch implementation of HED algorithm(Holistically-Nested Edge Detection) for document detection. The features are summarized blow:

- It is pure Pytorch code.
- It can automatically generate training samples to train the HED.

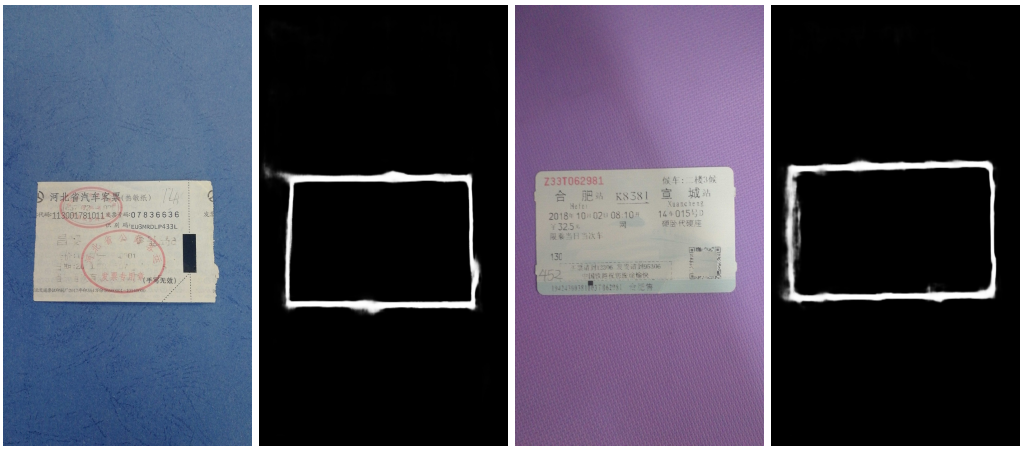
Some examples are shown bellow.

- Similar colors of the document and background:





- The results are better when there is a clear distinction between foreground and background:



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Requirements

- python3
- Any version of Pytorch version > 1.0 should be ok

Demo

Downloaded the trained model:

- Baidu Cloud Disk: Download Password: `rb3r`

and put it in `./savecheckpoint` run

```
python testHED.py --testImgPath=./demo \
--saveOutPath=./demoout \
--checkpointPath=./savecheckpoint/58000_net.pkl \
--gpu_list=2
```

The result edge image will be then written to the saveOutPath path.

Train

We have implemented two training methods to train HED document detection.

- Train without annotated data
- Train with annotated data

Train without annotated data

This implementation of HED document detection can be trained without any annotated data, except a set of foreground images and a set of background images

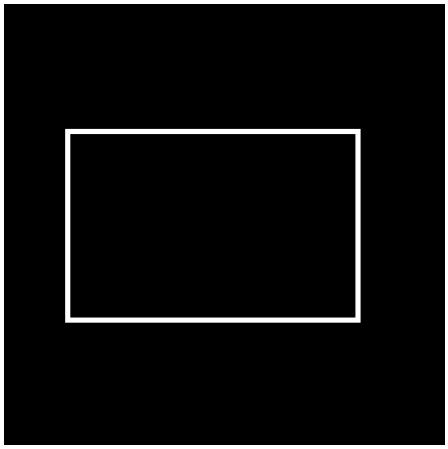
Put the foreground images to `./DATASET/source_image/foreground_images/` Put the background images to `./DATASET/source_image/background_images/` Some validation images should be provided in

./DATASET/dataset/testData/

```
python trainHED_Online.py --fgpath=./DATASET/source_image/foreground_images/ \
--bgpath=./DATASET/source_image/background_images/ \
--test_data_dir=./DATASET/dataset/testData/ \
--SaveCheckpointPath= ./saveModelTrainedOnline \
--SaveOutImgPath=./saveImgTrainedOnline \
--gpu_list=2
```

Train with data saved on the hard disk

- To train the model with your dataset, just provide the dataset by a .CSV file which include the image and the groundtruth pairs, see HED_Dataset.csv for an example. We provide a script for geting the .csv file ./tools/createDatasetListCSV.py.
- Annotated images for training HED model are difficult to obtain. A script to generate training samples is provided, see ./tools/generate_data.py for more details. An example of a pair of image and the groundtruth is shown bellow:



```
python trainHED.py --train_csv_file=./DATASET/dataset/HED_Dataset.csv \
--test_data_dir=./DATASET/dataset/testData \
--rootdir=./DATASET/dataset/ \
--SaveCheckpointPath= ./saveModelTrainedOnline \
--SaveOutImgPath=./saveImgTrainedOnline \
--gpu_list=2
```