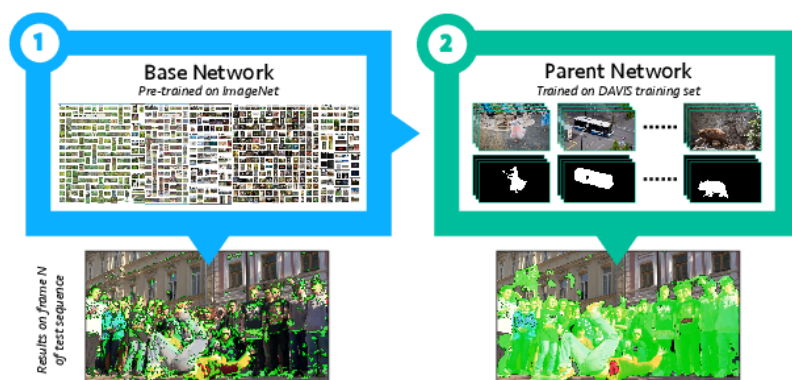

OSVOS: One-Shot Video Object Segmentation



Check our project page for additional information.

This repository was ported to PyTorch 0.4.0! OSVOS is a method that tackles the task of semi-supervised video object segmentation. It is based on a fully-convolutional neural network architecture that is able to successively transfer generic semantic information, learned on ImageNet, to the task of foreground segmentation, and finally to learning the appearance of a single annotated object of the test sequence (hence one-shot). Experiments on DAVIS 2016 show that OSVOS is faster than currently available techniques and improves the state of the art by a significant margin (79.8% vs 68.0%).

This PyTorch code is a posteriori implementation of OSVOS and it does not contain the boundary snapping branch. The results published in the paper were obtained using the Caffe version that can be found at OSVOS-cafe. TensorFlow implementation is also available at OSVOS-TensorFlow.

Installation:

1. Clone the OSVOS-PyTorch repository

```
1 git clone https://github.com/kmaninis/OSVOS-PyTorch.git
```

2. Install - if necessary - the required dependencies:

- Python (tested with Anaconda 2.7 and 3.6)
- PyTorch (`conda install pytorch torchvision -c pytorch` - tested with PyTorch 0.4, CUDA 8.0 and 9.0)
- Other python dependencies: numpy, scipy, matplotlib, opencv-python, graphviz.
- Optionally, install tensorboard (`pip install tensorboard tensorboardx`)

3. Edit the paths in mypath.py

Online training and testing

1. Download the parent model (55 MB), and unzip it under `models/`, by running: `Shell cd models/ chmod +x download_parent_model.sh ./download_parent_model.sh cd ..`
2. Edit in file `train_online.py` the 'User defined parameters' (eg. `gpu_id`, etc).
3. Run `python train_online.py`.

Training the parent network (optional)

1. All the training sequences of DAVIS 2016 are required to train the parent model, thus download them from here.
2. Download the VGG model (55 MB) pretrained on ImageNet, and unzip it under `models/`, by running: `Shell cd models/ chmod +x download_vgg_weights.sh ./download_vgg_weights.sh cd ..`
3. Place the files with the train and test sequences names in the DAVIS root folder (`db_root_dir()` in `mypath.py`).
4. Edit the 'User defined parameters' (eg. `gpu_id`) in file `train_parent.py`.
5. Run `train_parent.py`. This step takes 20 hours to train (Titan-X Pascal).

Enjoy!

Citation:

```
1 @Inproceedings{Cae+17,  
2   Title           = {One-Shot Video Object Segmentation},  
3   Author          = {S. Caelles and K.K. Maninis and J. Pont-Tuset and L.  
   . Leal-Taix\`e and D. Cremers and L. {Van Gool}},  
4   Booktitle       = {Computer Vision and Pattern Recognition (CVPR)},  
5   Year            = {2017}  
6 }
```

If you encounter any problems with the code, want to report bugs, etc. please contact us at {kmaninis, scaelles}@vision.ee.ethz.ch.