

Human Segmentation with Static Camera

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Implementations

We implemented 3 approaches to achieve human segmentation mask on three different formats (image, video and real-time). The files mentioned below are the files that have been implemented and coded by us with the help of the references and other tutorials available on the internet. YolAct being fairly new approach was implemented was customised and implemented and delivered better results than MaskRCNN. During the project, we modified YolAct to detect the outline of human category specifically. We also tried YolAct with different backbones like ResNet101, ResNet50 and Darknet53 and the experiment results illustrated that ResNet101 gave better performance overall. For Yolo-Background Subtraction, it was necessary to implement YoloV3 and then add masks and subtraction to it.

Deep Learning Models:

MaskRCNN

- MaskRCNN for image
 - MaskRcnn-Image.ipynb
- MaskRCNN for video
 - HumanSegementationVideo.ipynb
- MaskRCNN for Real Time
 - Realtime-MaskRcnn.ipynb
 - Instantiate.py

YOLACT

- YolAct For Videos
 - train.py
- YolAct for Realtime
 - Eval.py

Deep Learning Model with Traditional Background Subtraction

Yolo-BG Subtraction

- Yolo & YoloV3
 - Yolo.py
 - Object_detection_video_yolov3_tiny.py

- Yolo-Background– Subtraction
 - Yolo-bg.py
 - MaskMOG.py
 - Mask.py

Downloaded/Pre-Trained Weights

In order to speed up the development time, we downloaded some pre trained weights that could be used in the approaches. We also installed MaskRcnn from the matterport's github repo which further created a mrcnn directory with the environment. Similarly, Coco weights were downloaded to be used in the YolAct Model to reproduce the results. For the combination of DL-traditional approach, we worked on some ideas and some code cited by an author as mentioned below. We managed to use some of his work as a starting step and hence built our approach on it.

MaskRCNN

- MaskRCNN PyCoco Tools(coco weights)
 - Setup.py
 - mrcnn(directory : (https://github.com/matterport/Mask_RCNN))

YOLACT

- Imagenet-pretrained model for Resnet101, Resnet50, Darknet53
 - train.py

YOLO-BG subtraction

- Modified work by author: Arun Ponnusamy, website:
<https://www.arunponnusamy.com> on background subtraction in yolo.