Ear segmentation using Mask R-CNN

Assignment #2

Image Based Biometrics 2020/21, Faculty of Computer and Information Science, University of Ljubljana

Novak Marko

***Abstract*—Mask R-CNN is currently one of the top performing framework for object detection and segmentation. This report covers its use for ear segmentation on AWE database [1].**

I. Introduction

Mask R-CNN has been developed by researchers at Facebook AI Research as an upgrade to existing Faster R-CNN solution [2]. Key improvement in Mask R-CNN is that loss for segmentation masks is calculated in a class-independent way.

This report uses Mask R-CNN implementation by Matterport [3].

II. Methodology

AWE dataset comes with bounding boxes and ear masks. For best results with Mask R-CNN, each mask is split according to bounding boxes, so that we get an array of multiple masks per image. For faster training, these masks are stored as numpy files on start, and reused on each run. For training and detection, images are scaled to 512px and padded with zeros until square.

Model has been trained over 30 epochs, each with 100 steps and 8 images per step. Since images in AWE dataset are mostly well-oriented, training images have been randomly rotated between -25 and 25 degrees, and horizontally filpped in 50% cases.

III. Results

IV. Conclusion

Aenean tincidunt sodales ante et egestas. Nam consectetur nunc iaculis tincidunt egestas. Vivamus sagittis mi et vehicula facilisis. Phasellus semper volutpat gravida. Vestibulum vitae neque sed purus pharetra suscipit eget mollis dui. Morbi lobortis justo a lacus feugiat, et finibus eros tristique.

References

[1] Z. Emersic, V. Struc, and P. Peer, "Ear recognition: More than a survey," *CoRR*, vol. abs/1611.06203, 2016. [Online]. Available: http://arxiv.org/abs/1611.06203

[2] K. He, G. Gkioxari, P. Dollár, and R. B. Girshick, "Mask R-CNN," *CoRR*, vol. abs/1703.06870, 2017. [Online]. Available: http://arxiv.org/abs/1703.06870

[3] W. Abdulla, "Mask r-cnn for object detection and instance segmentation on keras and tensorflow," https://github.com/matterport/Mask_RCNN, 2017.