Assignment 5

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Deep Neural Networks

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Contents

1 Task

In this task you are suppose to implement a more advanced convolutional net using the same dataset as last week. The new network should contain one or more of the following

- Download the balloons dataset https://github.com/matterport/Mask RCNN/releases
- Use a pretrained model (e.g., MaskRCNN) to do instance segmentation and automatically color in balloons
- Look at Tensorflow example https://engineering.matterport. com/splash-of-color-instance-segmentation-with-mask-r-cnn-and-tensorflow-7c761e238b46
- Choose the network architecture with care.
- Train and validate all algorithms.

2 Object Detection

The task is to do instance segmentation and automatically color in balloons. The Mask R-CNN model is used for this purpose, and we adopted . The Mask R-CNN model is pre-trained and loaded with weights specifically trained for balloon detection. The predict program is adopted from a Git repository that uses Mask R-CNN with the 'coco' dataset and is adjusted to use the weigths from the pretrain-model.

The model architecture is initialized based on the SimpleConfig. Pre-trained weights from the file `mask_rcnn_balloon.h5` are then loaded into the model.

An input image is loaded and converted from BGR to RGB format. A forward pass is performed using the Mask R-CNN model, and the results, including bounding boxes, class IDs, and scores, are visualized.

*[h]

Figure 1: Result Balloon Segmentation