PhD Literature

Bridging the Gap Between Detection and Tracking A Unified Approach iccv19

2020-04-21 1:35:01 PM

Two branch network that takes two images – called exemplar and query images – as inputs

a target guidance module is added to the detector backbone to guide an existing detector towards the target object and replace its classification head by some sort of meta learning classification layer to distinguish between the target object and distractors

This target guidance module serves to bridge the two branches

Supposed to be a universal framework that can be attached to augment any existing modern detector although testing is only done with faster R CNN and SSD

trained on triplets of chronologically extracted frames from the video

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Exemplar image is used for target guidance by using ROI pooling on the target box followed by some convolutional layers to construct the so called modulator or a vector of the same size as the number of channels in the features produced by the search region coming from the query image

This modulator is then used to re-weight different channels of the search features apparently under the assumption that different channels correspond to different localities from within the search region so that such a weighting can emphasize the target region in some way

The global target features as well as the original and modulated search features are then on merged together to create an output of the same size as the original based network to which this modules is plugged in

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The support image is used for the inner optimization loop where only the Classification head parameters are updated while the query image is used in the outer optimization loop at all the parameters are updated – this choice seems to be mostly empirical

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Only inner optimization performed online – 5 iterations in the first frame with 16 samples generated by augmentation and 1 iteration with 1 sample at regular intervals

Lots of heuristics seem to be present in the online portion as usual

specifically the so called anchored updating of parameters where the initial parameters are taken as anchors and all subsequent updates are taken as a weighted average between the initial weights and the new ones which is supposed to help with overfitting but eventually it will lead to that anyway

The detections are then applied to the Siamese like the distance and size penalization using the usual cosine window type weighting in the target size itself is also updated as a weighted average of the detection box and its old size