PhD

Exploit the Connectivity Multi-Object Tracking with TrackletNet ax1811.07258 mm19

2019-12-30 12:09:44 PM

Graph based model with tracklets instead of detections as vertices

Each tracklet is a group of detections from consecutive frames associated by the usual IOU and appearance metrics

Clustering of tracklets based on similarity to form trajectories

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Each tracklet formed by associating detections using at epipolar matching with the fundamental metrics between the two consecutive frames computed using RANSAC and SURF which is dubious at best

Track lets in the graph that are far apart in time are not connected by edges

Graph optimization consists of finding the joint sub graphs or clusters within the graph such that each one corresponds to a single trajectory which is performed using some kind of greedy search based optimization since global optimization is apparently APX hard

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The 2 tracklets – consecutive in time – that are to be compared are represented by a 4+512 D feature vector representing bounding box and appearance features respectively for each detection
some sort of interpolation is used to fill in any missing frames between the two

couple of binary masks are also used to indicate the presence or absence of detections in each frame for each of the tracklets

Temporal window of size 64 is used for each such comparison so that the total input size is 516 X 64 X 3

Four 1D convolutional layers that perform convolution only in the temporal domain – each one can involves over a different temporal slice supposedly capture

short-term and long-term dependencies

This is followed by some sort of average pooling over appearance features and FC layers to make the prediction which is simply a number between 0 and 1 indicating the probability the track lets belonging to the same trajectory

Performance seems comparable the state of the art with about 50% MOTA in both MOT 16 and 17