PhD

FAMNet Joint Learning of Feature, Affinity and Multi-Dimensional Assignment for Online Multiple Object Tracking iccv19

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differentiable approximate association method that might be useful

name stands for feature extraction, affinity estimation and multidimensional assignment which are the three tasks that are supposedly performed jointly in an end to end manner

Training is done using the assignment ground truth and all layers are designed to be differentiable to allow this

assignment network implements some sort of approximate Association algorithm called rank 1 tensor approximation power iteration which was apparently introduced in multiple previous papers from 2019 and 2013

basic idea of the approximation seems to be to decompose the global assignment into a set of local assignments where only pairs of consecutive frames are considered

Supposed to be able to process arbitrary number of consecutive frames in a single batch but all experiments seem to be limited to the usual low amount of 3 frames

Feature subnetwork is Siamese style and its output is the input to the affinity subnetwork

uses the detection from the middle frame in the three frame window as the anchor followed by some heuristics based feature extraction and combination

The overall affinity function is a sum of 2 terms for measuring the pairwise affinity and the long term affinity where the former simply uses the cross correlation Between the feature vectors While some sort of spatial attention based CNN is used for the latter

The multidimensional assignment seems to be full of heuristical approximations with very suboptimal theoretical guarantees and uses L1 normalization to approximately satisfy some of the original constraints

process of generating the association ground truth including the hypothesis

trajectories is riddled with heuristics as usual

Single object tracking is also used in the rather obvious way of pooling together tracked and detected boxes to there is some attempt to treat the tracked boxes differently Witches, however, riddled with heuristics