Multiple Object Tracking from appearance by hierarchically clustering tracklets

Paper ID: 362

Andreu Girbau, Ferran Marqués, Shin'ichi Satoh

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

国立情報学研究所 National Institute of Informatics

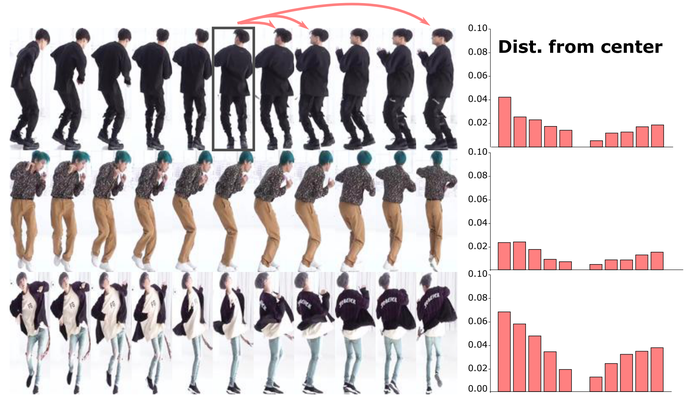
BMVC 2022

1. Motivation

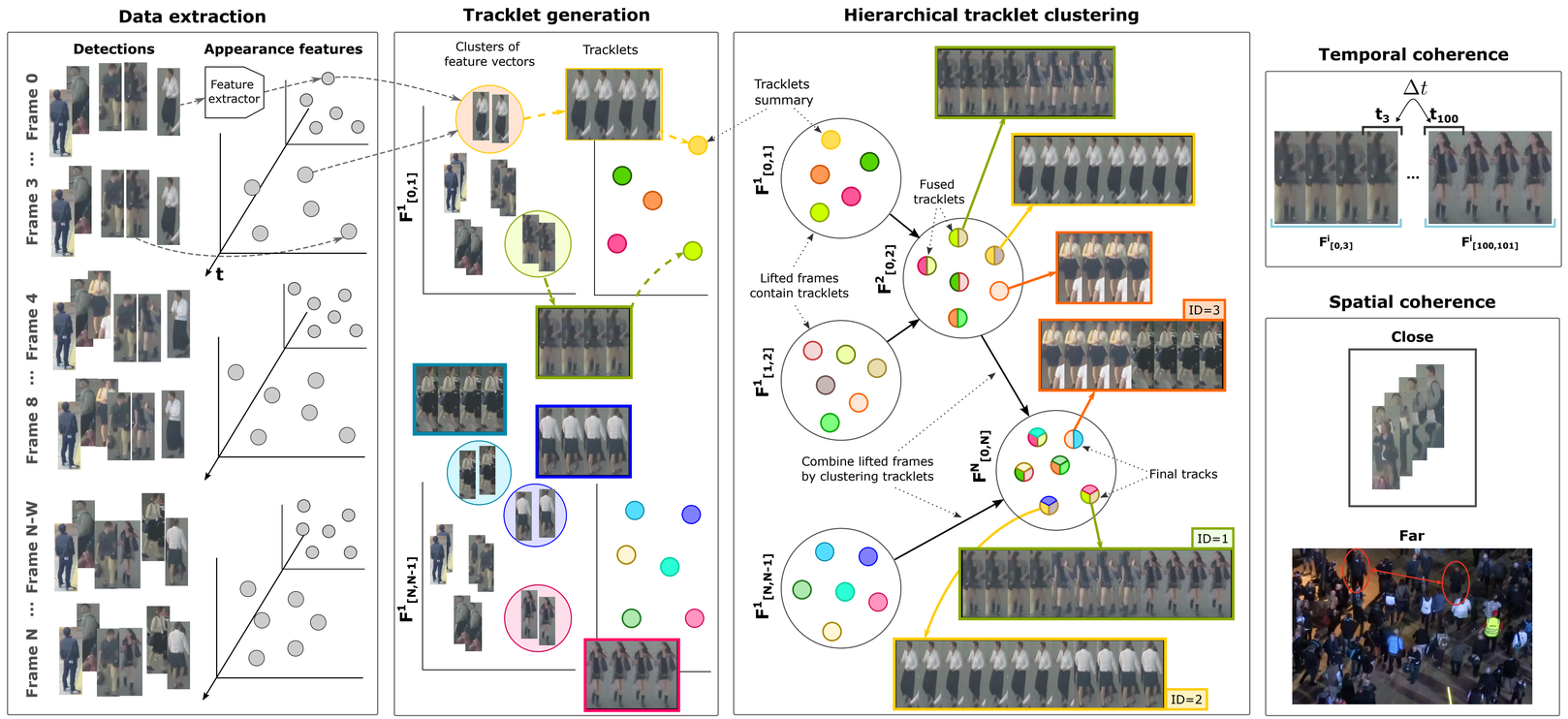
1.**Multiple Object Tracking** consists on estimating the trajectory of a set of objects along a video sequence. Used in autonomous driving, robotics, or automatic production.

2.The same object in a **temporal neighborhood** has similar appearance. Build **tracklets** to exploit that. Use **Appearance** to associate objects via **hierarchical clustering** of tracklets.

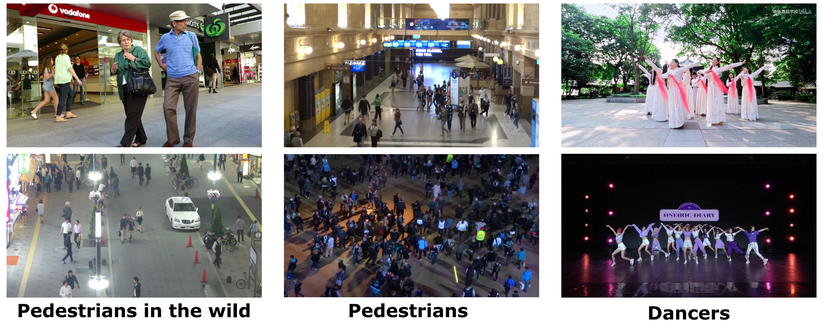
3.**Simple** yet **high performing** MOT method using off-the-shelf models.



2. Method



3. Datasets



MOT17 — Pedestrians in the wild

MOT20 — Pedestrians +density, +length

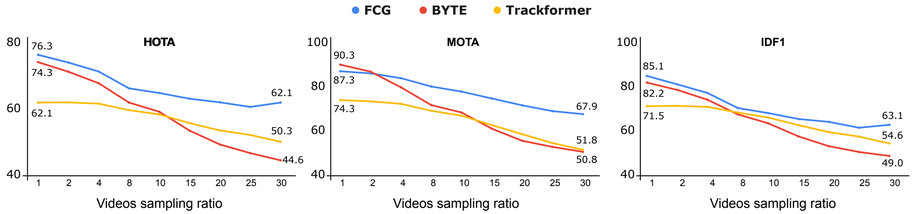
DanceTrack — Dancers +occlusions, +random motion

4. Experiments

Methods	MOT17 [1]			MOT20 [2]			DanceTrack [3]		
	HOTA	MOTA	IDF1	HOTA	MOTA	IDF1	HOTA	MOTA	IDF1
CenterTrack (ECCV20)	52.2	67.8	64.7	-	-	-	41.8	86.8	35.7
FairMOT (IJCV21)	59.3	73.7	72.3	54.6	61.8	67.3	39.7	82.2	40.8
QDTrack (CVPR21)	53.9	68.7	66.3	-	-	-	45.7	83.0	44.8
TraDes (CVPR21)	52.7	69.1	63.9	-	-	-	43.3	86.2	41.2
Trackformer (CVPR22)	57.3	74.1	68.0	54.7	68.6	65.7	-	-	-
ReMOT (IVC21)	59.7	77.0	72.0	61.2	77.4	73.1	-	-	-
CrowdTrack (AVSS21)	60.3	75.6	73.6	55.0	70.7	68.2	-	-	-
MAA (WACV22)	62.0	79.4	75.9	57.3	73.9	71.2	-	-	-
FCG (Ours)	62.6	76.7	**77.7**	57.3	68.0	69.7	48.7	**89.9**	46.5
BYTE (ECCV22)	**63.1**	**80.3**	77.3	**61.3**	**77.8**	**75.2**	47.7	89.6	**53.9**
MOTR (ECCV22)	57.8	73.4	68.6	-	-	-	**54.2**	79.7	51.5

Low fps setting

MOT 17 - Validation set



[1] Milán et al. *MOT16: A Benchmark for Multi-Object Tracking.* 2016

[2] Dendorfer et al. *Mot20: A benchmark for multi object tracking in crowded scenes.* 2020

[3] Sun, Cao et al. *DanceTrack: Multi-Object Tracking in Uniform Appearance and Diverse Motion.* In CVPR 2022