

Some benchmark of MOT2015 (test)					
RANK	Algorithm	MOTA	IDsw	Average FPS	Detector
1	KCF	38.9 $\pm$ 14.5	720 (13.9)	0.3	Public
...	...	...	...	...	Public
15	DCCRF	33.6 $\pm$ 11.0	866 (19.4)	0.1	Public
...	...	...	...	...	Public
26	MDP	30.3 $\pm$ 14.6	680	1.1	Public
...	...	...	...	...	Public
41	DAC_min	26.1 $\pm$ 13.5	506	11.6	Public
...	...	...	...	...	Public
60	LP2D	19.8 $\pm$ 14.2	1649	112.1	Public
...	...	...	...	...	Public
65	RNN_LSTM	19.0 $\pm$ 15.2	1490	165.2	Public
<b>66</b>	<b>Ours</b>	<b>18.7 <math>\pm</math> 16.3</b>	<b>1290</b>	<b>21.3</b>	<b>Private</b>
67	RMOT	18.6 $\pm$ 17.5	684	7.9	Public
...	...	...	...	...	Public
71	GSCRR	15.8 $\pm$ 10.5	514	28.1	Public
...	...	...	...	...	Public
75	DP_NMS	14.5 $\pm$ 14.5	4,537	444.8	Public
76	LDCT	4.7 $\pm$ 41.3	12,348	20.7	Public

MOT challenge Website:

[https://motchallenge.net/results/2D\\_MOT\\_2015/?chl=2&orderBy=MOTA&orderStyle=ASC&det=Public](https://motchallenge.net/results/2D_MOT_2015/?chl=2&orderBy=MOTA&orderStyle=ASC&det=Public)

NOTE: the other models above use provided detection result and only ran tracker for the evaluation. Our model run both detection (YOLOv3 tiny) and tracker (modified Deep SORT).

# ALL SUMMARY

FULL TABLE (ALL) [Only choose the skip1 for comparison]				
Algorithm	MOTA	IDsw	Average FPS	Some metrics?
Vanilla YOLOv3 Tiny + Deep SORT	33.6%	635	9.997820328723746	
YOLOv3 Tiny + Deep SORT (skip1)	30.7%	570	21.04679665688465	
YOLOv3 Tiny + Deep SORT (skip1 with probability-driven)	31.0%	594	20.462735731270826	
Vanilla Mobilenet SSD + Deep SORT	19.0%	577	9.8474409913098	
Mobilenet SSD + Deep SORT (skip1)	17.7%	520	15.964183221155363	
Mobilenet SSD + Deep SORT (skip1 with probability-driven)	18.0%	523	14.404656840037314	
Vanilla Squeezenet_1_0 + Deep SORT	9.9%	484	20.042197668270926	
Squeezenet 1.0 + Deep SORT (skip1)	9.3%	470	33.892409156740605	
Squeezenet 1.0 + Deep SORT (skip1 with probability-driven)	9.4%	475	32.83395018961477	

# YOLOv3 Tiny + Deep SORT

FULL TABLE (YOLOv3_tiny + Deep SORT)			
Algorithm	MOTA	IDsw	Average FPS
Vanilla YOLOv3 Tiny + Deep SORT	33.6%	635	9.997820328723746
YOLOv3 Tiny + Deep SORT with Down Sampling	32.9%	651	11.996064715800753
...			
YOLOv3 Tiny + Deep SORT with 1 Skip Frame	30.7%	570	16.56956741670473 (latest:21.04679665688465)
YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Down Sampling	30.0%	577	20.99549490626117
YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Probability Driven	31.0%	594	17.757431631657468 (latest:20.46273573127082)
YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Probability Driven and Down Sampling	30.4%	601	19.84908451201911
...			
YOLOv3 Tiny + Deep SORT with 2 Skip Frame	26.3%	581	20.68914912740483
YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Down Sampling	25.6%	538	25.16089209909558
YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Probability Driven	28.2%	581	21.671446463250184
YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Probability Driven and Down Sampling	27.2%	561	22.40254902085448
...			
YOLOv3 Tiny + Deep SORT with 4 Skip Frame	17.4%	858	30.685362182060103
YOLOv3 Tiny + Deep SORT with 4	17.3%	826	32.71531749075337

Skip Frame and Down Sampling			
YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Probability Driven	22.0%	778	26.27376224976722
YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Probability Driven and Down Sampling	21.5%	721	28.642976056106697
...			
YOLOv3 Tiny + Deep SORT with 6 Skip Frame	11.5%	809	35.487960011851555
YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Down Sampling	11.1%	821	36.79384991372523
YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Probability Driven	17.7%	758	28.440129230784574
YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Probability Driven and Down Sampling	17.2%	760	30.637051555246025

Tradeoff of Down Sampling			
Algorithm	MOTA	IDsw	Average FPS
Vanilla YOLOv3 Tiny + Deep SORT	33.6%	635	9.997820328723746
YOLOv3 Tiny + Deep SORT with Down Sampling	32.9%	651	11.996064715800753
YOLOv3 Tiny + Deep SORT with 1 Skip Frame	30.7%	570	16.56956741670473
YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Down Sampling	30.0%	577	20.99549490626117
YOLOv3 Tiny + Deep SORT with 2 Skip Frame	26.3%	581	20.68914912740483
YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Down Sampling	25.6%	538	25.16089209909558
YOLOv3 Tiny + Deep SORT with 4 Skip Frame	17.4%	858	30.685362182060103
YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Down Sampling	17.3%	826	32.71531749075337
YOLOv3 Tiny + Deep SORT with 6 Skip Frame	11.5%	809	35.487960011851555
YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Down Sampling	11.1%	821	36.79384991372523

Tradeoff of Skipping Frame			
Algorithm	MOTA	IDsw	Average FPS
Vanilla YOLOv3 Tiny + Deep SORT	33.6%	635	9.997820328723746
YOLOv3 Tiny + Deep SORT with 1 Skip Frame	30.7%	570	16.56956741670473
YOLOv3 Tiny + Deep SORT with 2 Skip Frame	26.3%	581	20.68914912740483
YOLOv3 Tiny + Deep SORT with 4 Skip Frame	17.4%	858	30.685362182060103
YOLOv3 Tiny + Deep SORT with 6 Skip Frame	11.5%	809	35.487960011851555

Tradeoff of Using probability Driven Detection			
Algorithm	MOTA	IDsw	Average FPS
Vanilla YOLOv3 Tiny + Deep SORT	33.6%	635	9.997820328723746
YOLOv3 Tiny + Deep SORT with 1 Skip Frame	30.7%	570	18.56956741670473
YOLOv3 Tiny + Deep SORT with 1 Skip Frame and Probability Driven	31.0%	594	17.757431631657468
YOLOv3 Tiny + Deep SORT with 2 Skip Frame	26.3%	581	22.68914912740483
YOLOv3 Tiny + Deep SORT with 2 Skip Frame and Probability Driven	28.2%	581	21.671446463250184
YOLOv3 Tiny + Deep SORT with 4 Skip Frame	17.4%	858	30.685362182060103
YOLOv3 Tiny + Deep SORT with 4 Skip Frame and Probability Driven	22.0%	778	26.27376224976722
YOLOv3 Tiny + Deep SORT with 6 Skip Frame	11.5%	809	35.487960011851555
YOLOv3 Tiny + Deep SORT with 6 Skip Frame and Probability Driven	17.7%	758	28.440129230784574



# Mobilenet SSD + Deep SORT

FULL TABLE (Mobilenet SSD + Deep SORT)			
Algorithm	MOTA	IDsw	Average FPS
Vanilla Mobilenet SSD + Deep SORT	19.0%	577	9.8474409913098
Mobilenet SSD+ Deep SORT with Down Sampling	17.5%	647	10.164599991702229
...			
Mobilenet SSD+ Deep SORT with 1 Skip Frame	17.7%	520	15.964183221155363
Mobilenet SSD+ Deep SORT with 1 Skip Frame and Down Sampling	16.6%	569	16.252922740164827
Mobilenet SSD+ Deep SORT with 1 Skip Frame and Probability Driven	18.0%	523	14.404656840037314
Mobilenet SSD+ Deep SORT with 1 Skip Frame and Probability Driven and Down Sampling	16.8%	573	14.878176973130104
...			
Mobilenet SSD+ Deep SORT with 2 Skip Frame	15.7%	494	20.658319625464184
Mobilenet SSD+ Deep SORT with 2 Skip Frame and Down Sampling	14.4%	530	20.67430430123686
Mobilenet SSD+ Deep SORT with 2 Skip Frame and Probability Driven	16.5%	503	17.894475042242103
Mobilenet SSD+ Deep SORT with 2 Skip Frame and Probability Driven and Down Sampling	15.5%	553	18.656240404675874
...			
Mobilenet SSD+ Deep SORT with 4 Skip Frame	10.7%	569	27.779953587538593
Mobilenet SSD+ Deep SORT with 4	9.5%	577	28.811689015745316

Skip Frame and Down Sampling			
Mobilenet SSD+ Deep SORT with 4 Skip Frame and Probability Driven	13.2%	552	22.686678543601083
Mobilenet SSD+ Deep SORT with 4 Skip Frame and Probability Driven and Down Sampling	12.0%	567	24.149181226030407
...			
Mobilenet SSD+ Deep SORT with 6 Skip Frame	7.7%	586	32.62759230159879
Mobilenet SSD+ Deep SORT with 6 Skip Frame and Down Sampling	6.0%	632	33.97791236616167
Mobilenet SSD+ Deep SORT with 6 Skip Frame and Probability Driven	10.7%	558	26.286393126809276
Mobilenet SSD+ Deep SORT with 6 Skip Frame and Probability Driven and Down Sampling	9.9%	601	27.845049291724436

Tradeoff of Down Sampling			
Algorithm	MOTA	IDsw	Average FPS
Vanilla Mobilenet SSD + Deep SORT	19.0%	577	9.8474409913098
Mobilenet SSD+ Deep SORT with Down Sampling	17.5%	647	10.164599991702229
Mobilenet SSD+ Deep SORT with 1 Skip Frame	17.7%	520	15.964183221155363
Mobilenet SSD+ Deep SORT with 1 Skip Frame and Down Sampling	16.6%	569	16.252922740164827
Mobilenet SSD+ Deep SORT with 2 Skip Frame	15.7%	494	20.658319625464184
Mobilenet SSD+ Deep SORT with 2 Skip Frame and Down Sampling	14.4%	530	20.67430430123686
Mobilenet SSD+ Deep SORT with 4 Skip Frame	10.7%	569	27.779953587538593
Mobilenet SSD+ Deep SORT with 4 Skip Frame and Down Sampling	9.5%	577	28.811689015745316
Mobilenet SSD+ Deep SORT with 6 Skip Frame	7.7%	586	32.62759230159879
Mobilenet SSD+ Deep SORT with 6 Skip Frame and Down Sampling	6.0%	632	33.97791236616167

Tradeoff of Skipping Frame			
Algorithm	MOTA	IDsw	Average FPS
Vanilla Mobilenet SSD + Deep SORT	19.0%	577	9.8474409913098
Mobilenet SSD+ Deep SORT with 1 Skip Frame	17.7%	520	15.964183221155363
Mobilenet SSD+ Deep SORT with 2 Skip Frame	15.7%	494	20.658319625464184
Mobilenet SSD+ Deep SORT with 4 Skip Frame	10.7%	569	27.779953587538593
Mobilenet SSD+ Deep SORT with 6 Skip Frame	7.7%	586	32.62759230159879

Tradeoff of Using probability Driven Detection			
Algorithm	MOTA	IDsw	Average FPS
Vanilla Mobilenet SSD + Deep SORT	19.0%	577	9.8474409913098
Mobilenet SSD+ Deep SORT with 1 Skip Frame	17.7%	520	15.964183221155363
Mobilenet SSD+ Deep SORT with 1 Skip Frame and Probability Driven	18.0%	523	14.404656840037314
Mobilenet SSD+ Deep SORT with 2 Skip Frame	15.7%	494	20.658319625464184
Mobilenet SSD+ Deep SORT with 2 Skip Frame and Probability Driven	16.5%	503	17.894475042242103
Mobilenet SSD+ Deep SORT with 4 Skip Frame	10.7%	569	27.779953587538593
Mobilenet SSD+ Deep SORT with 4 Skip Frame and Probability Driven	13.2%	552	22.686678543601083
Mobilenet SSD+ Deep SORT with 6 Skip Frame	7.7%	586	32.62759230159879
Mobilenet SSD+ Deep SORT with 6 Skip Frame and Probability Driven	10.7%	558	26.286393126809276

# Squeezenetv1.0 + Deep SORT

FULL TABLE(Squeezenet_1_0 + Deep SORT)			
Algorithm	MOTA	IDsw	Average FPS
Vanilla Squeezenet_1_0 + Deep SORT	9.9%	484	20.042197668270926
Squeezenet_1_0+ Deep SORT with Down Sampling	9.4%	433	20.717160451288965
...			
Squeezenet_1_0+ Deep SORT with 1 Skip Frame	9.3%	470	33.892409156740605
Squeezenet_1_0+ Deep SORT with 1 Skip Frame and Down Sampling	8.9%	438	34.70319714140534
Squeezenet_1_0+ Deep SORT with 1 Skip Frame and Probability Driven	9.4%	475	32.83395018961477
Squeezenet_1_0+ Deep SORT with 1 Skip Frame and Probability Driven and Down Sampling	9.0%	442	34.2523215195093
...			
Squeezenet_1_0+ Deep SORT with 2 Skip Frame	8.4%	408	42.13578772760607
Squeezenet_1_0+ Deep SORT with 2 Skip Frame and Down Sampling	8.2%	372	43.91007535351279
Squeezenet_1_0+ Deep SORT with 2 Skip Frame and Probability Driven	8.6%	412	40.69885878710128
Squeezenet_1_0+ Deep SORT with 2 Skip Frame and Probability Driven and Down Sampling	8.3%	368	43.13519724065963
...			
Squeezenet_1_0+ Deep SORT with 4 Skip Frame	6.8%	328	53.7290647954817



Squeezenet_1_0+ Deep SORT with 4 Skip Frame and Down Sampling	6.6%	301	56.63252656732362
Squeezenet_1_0+ Deep SORT with 4 Skip Frame and Probability Driven	7.3%	343	49.940943534497414
Squeezenet_1_0+ Deep SORT with 4 Skip Frame and Probability Driven and Down Sampling	6.9%	312	53.98874989205801
...			
Squeezenet_1_0+ Deep SORT with 6 Skip Frame	5.6%	301	62.0070361055159
Squeezenet_1_0+ Deep SORT with 6 Skip Frame and Down Sampling	5.4%	284	63.02879991725403
Squeezenet_1_0+ Deep SORT with 6 Skip Frame and Probability Driven	6.1%	313	58.15515176744455
Squeezenet_1_0+ Deep SORT with 6 Skip Frame and Probability Driven and Down Sampling	6.0%	297	59.56392827961034

Tradeoff of Down Sampling			
Algorithm	MOTA	IDsw	Average FPS
Vanilla Squeezenet_1_0 + Deep SORT	9.9%	484	20.042197668270926
Squeezenet_1_0+ Deep SORT with Down Sampling	9.4%	433	20.717160451288965
Squeezenet_1_0+ Deep SORT with 1 Skip Frame	9.3%	470	33.892409156740605
Squeezenet_1_0+ Deep SORT with 1 Skip Frame and Down Sampling	8.9%	438	34.70319714140534
Squeezenet_1_0+ Deep SORT with 2 Skip Frame	8.4%	408	42.13578772760607
Squeezenet_1_0+ Deep SORT with 2 Skip Frame and Down Sampling	8.2%	372	43.91007535351279
Squeezenet_1_0+ Deep SORT with 4 Skip Frame	6.8%	328	53.7290647954817
Squeezenet_1_0+ Deep SORT with 4 Skip Frame and Down Sampling	6.6%	301	56.63252656732362
Squeezenet_1_0+ Deep SORT with 6 Skip Frame	5.6%	301	62.0070361055159
Squeezenet_1_0+ Deep SORT with 6 Skip Frame and Down Sampling	5.4%	284	63.02879991725403

Tradeoff of Skipping Frame			
Algorithm	MOTA	IDsw	Average FPS
Vanilla Squeezenet_1_0 + Deep SORT	9.9%	484	20.042197668270926
Squeezenet_1_0+ Deep SORT with 1 Skip Frame	9.3%	470	33.892409156740605
Squeezenet_1_0+ Deep SORT with 2 Skip Frame	8.4%	408	42.13578772760607
Squeezenet_1_0+ Deep SORT with 4 Skip Frame	6.8%	328	53.7290647954817
Squeezenet_1_0+ Deep SORT with 6 Skip Frame	5.6%	301	62.0070361055159

Tradeoff of Using probability Driven Detection			
Algorithm	MOTA	IDsw	Average FPS
Vanilla Squeezenet_1_0 + Deep SORT	9.9%	484	20.042197668270926
Squeezenet_1_0+ Deep SORT with 1 Skip Frame	9.3%	470	33.892409156740605
Squeezenet_1_0+ Deep SORT with 1 Skip Frame and Probability Driven	9.4%	475	32.83395018961477
Squeezenet_1_0+ Deep SORT with 2 Skip Frame	8.4%	408	42.13578772760607
Squeezenet_1_0+ Deep SORT with 2 Skip Frame and Probability Driven	8.6%	412	40.69885878710128
Squeezenet_1_0+ Deep SORT with 4 Skip Frame	6.8%	328	53.7290647954817
Squeezenet_1_0+ Deep SORT with 4 Skip Frame and Probability Driven	7.3%	343	49.940943534497414
Squeezenet_1_0+ Deep SORT with 6 Skip Frame	5.6%	301	62.0070361055159
Squeezenet_1_0+ Deep SORT with 6 Skip Frame and Probability Driven	6.1%	313	58.15515176744455