2021 ICCV OCTOBER 11-17 VIRTUAL

VOT visual object tracking challenge

Fusing Complementary Trackers for Long-Term Visual Tracking

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hic sunt futura

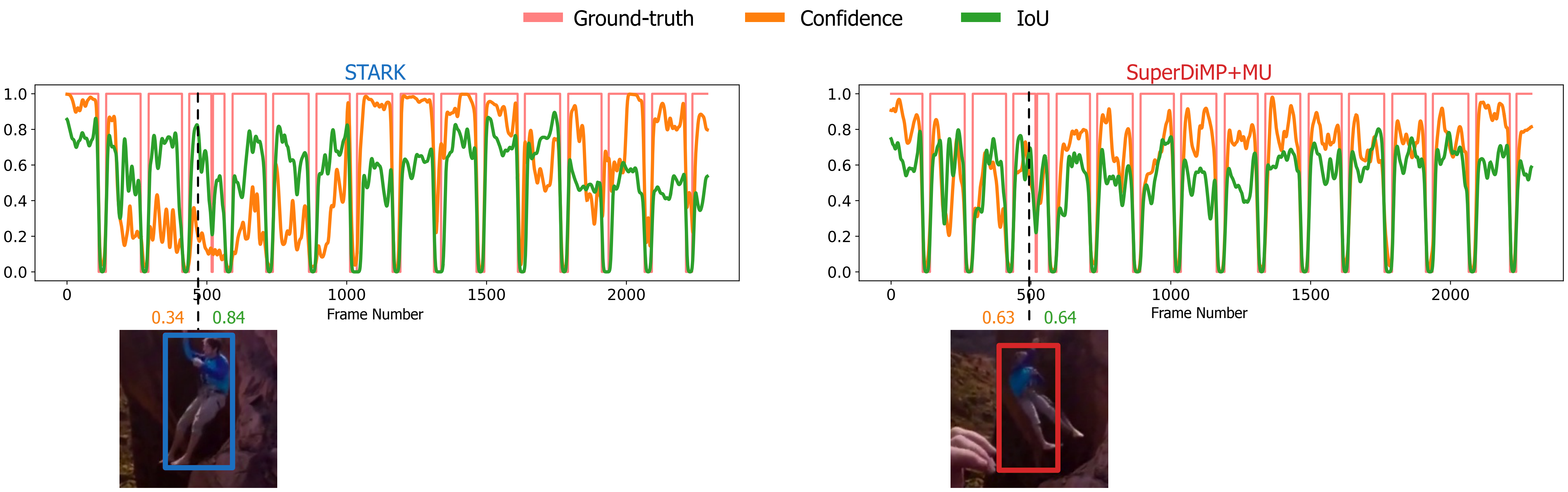
mlp Machine Learning and Perception

Motivation

STARK SuperDiMP+MU

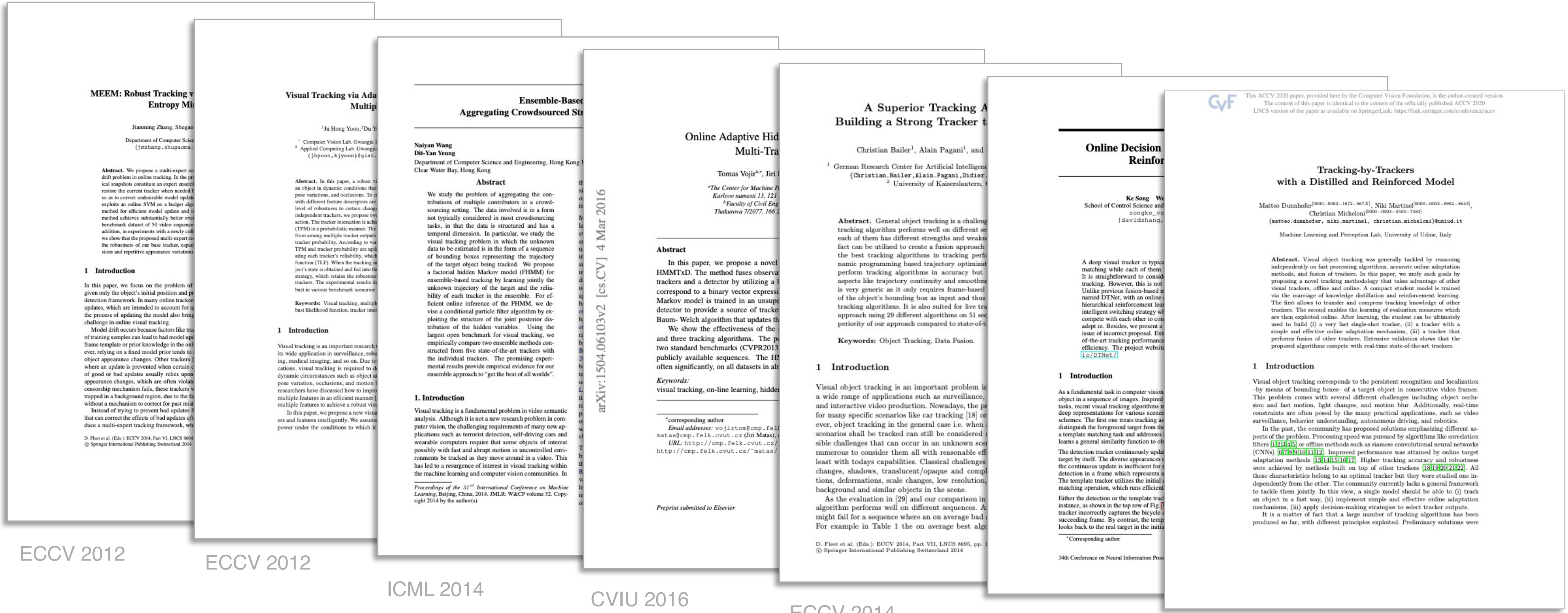
[1] **‘Learning Spatio-Temporal Transformer for Visual Tracking’,** ICCV 2021
[2] **‘The Eight Visual Object Tracking Challenge Results’,** VOT2020

Motivation



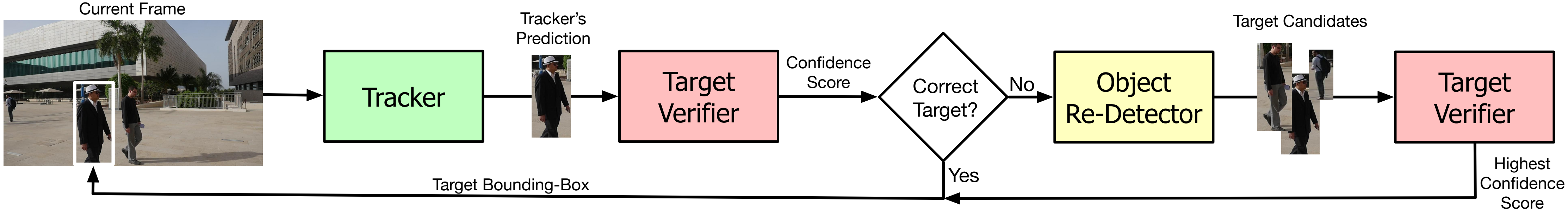
Ground-truth
Confidence
IoU
STARK
SuperDiMP+MU
1.0
0.8
0.6
0.4
0.2
0.0
0
500
1000
1500
2000
Frame Number
0.34
0.84
0.63
0.64

Fusion of Trackers

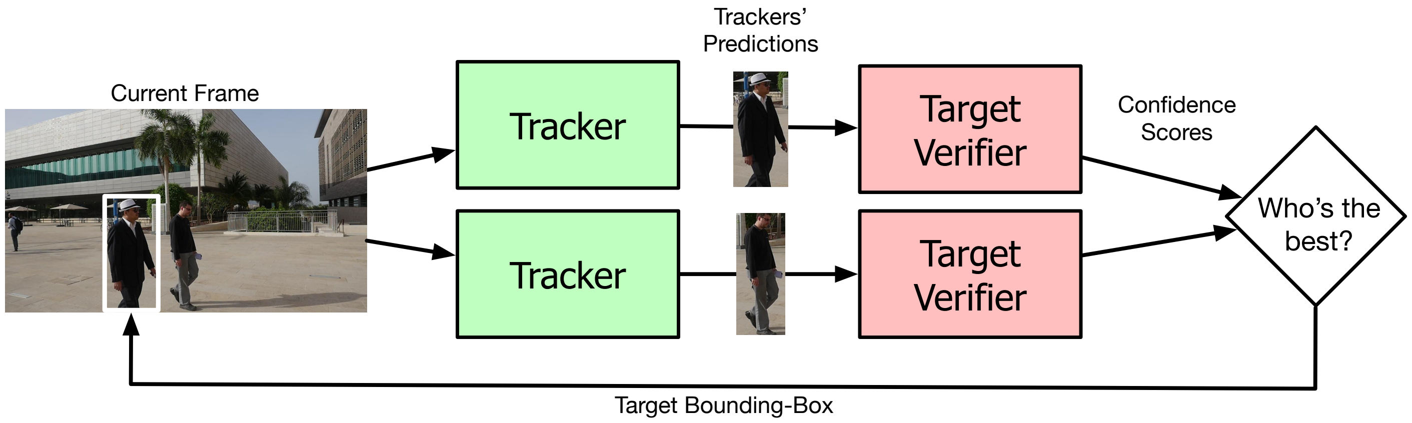


ECCV 2012 | ECCV 2012 | ICML 2014 | CVIU 2016 | ECCV 2014 | NeurIPS 2020 | ACCV 2020

A Different Long-Term Pipeline

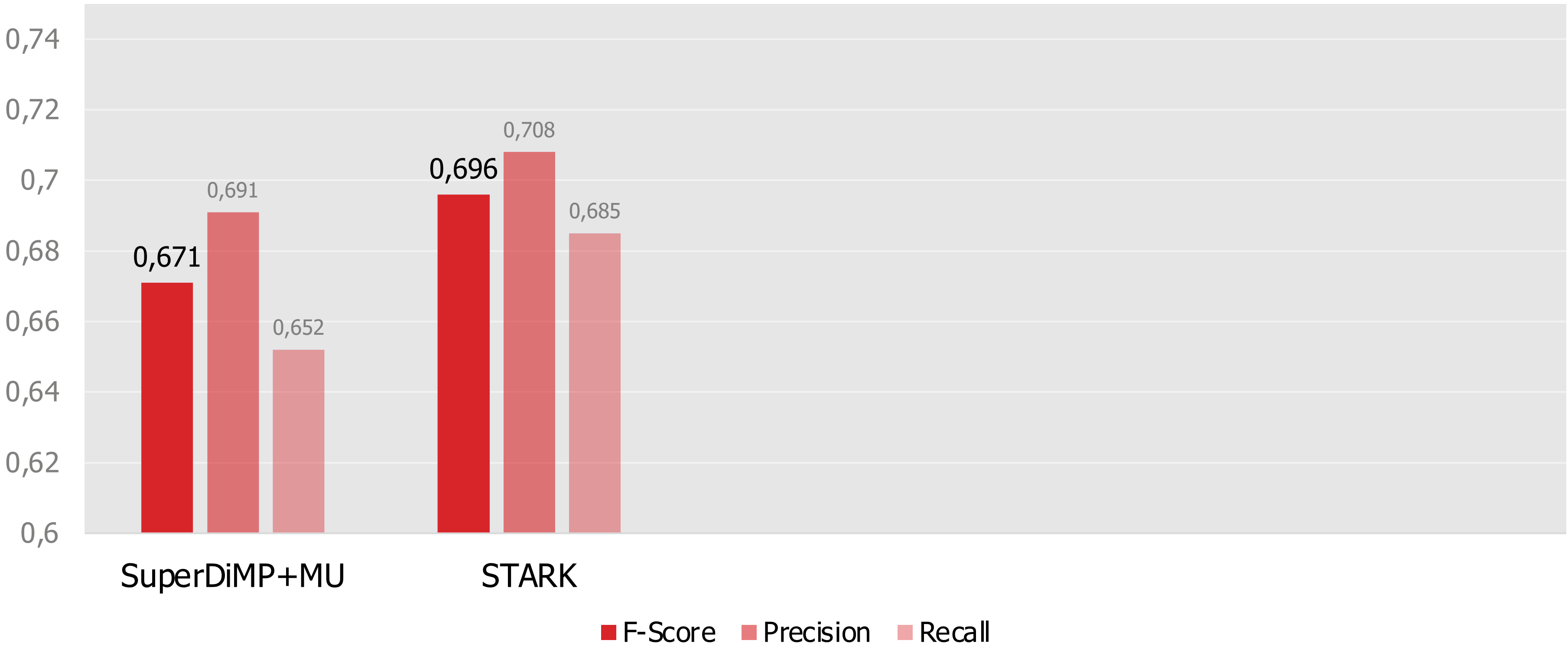


Scheme of the most successful standard long-term solutions



Scheme of our approach

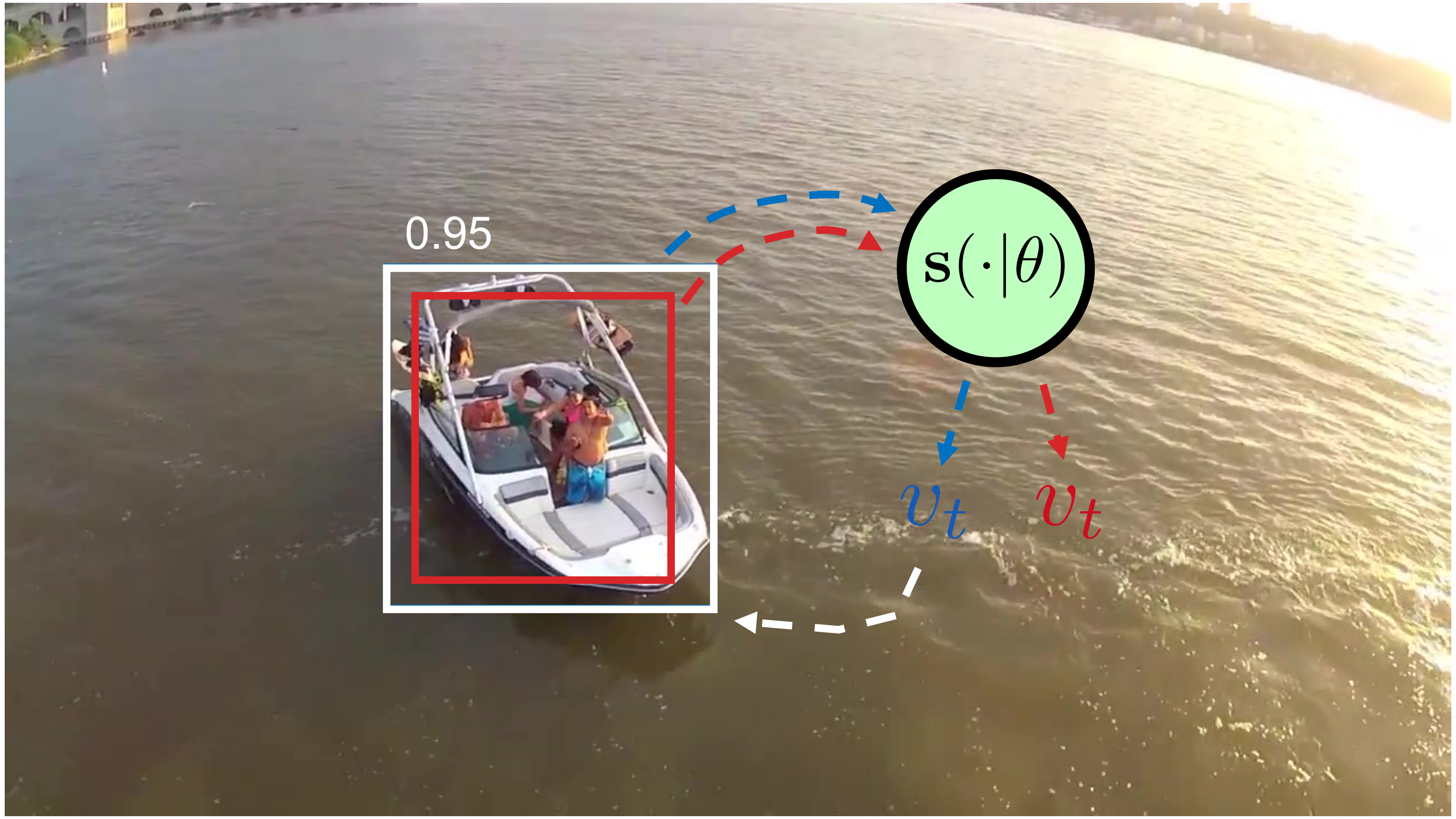
Fusion Baselines



Fusion Baselines - Avg

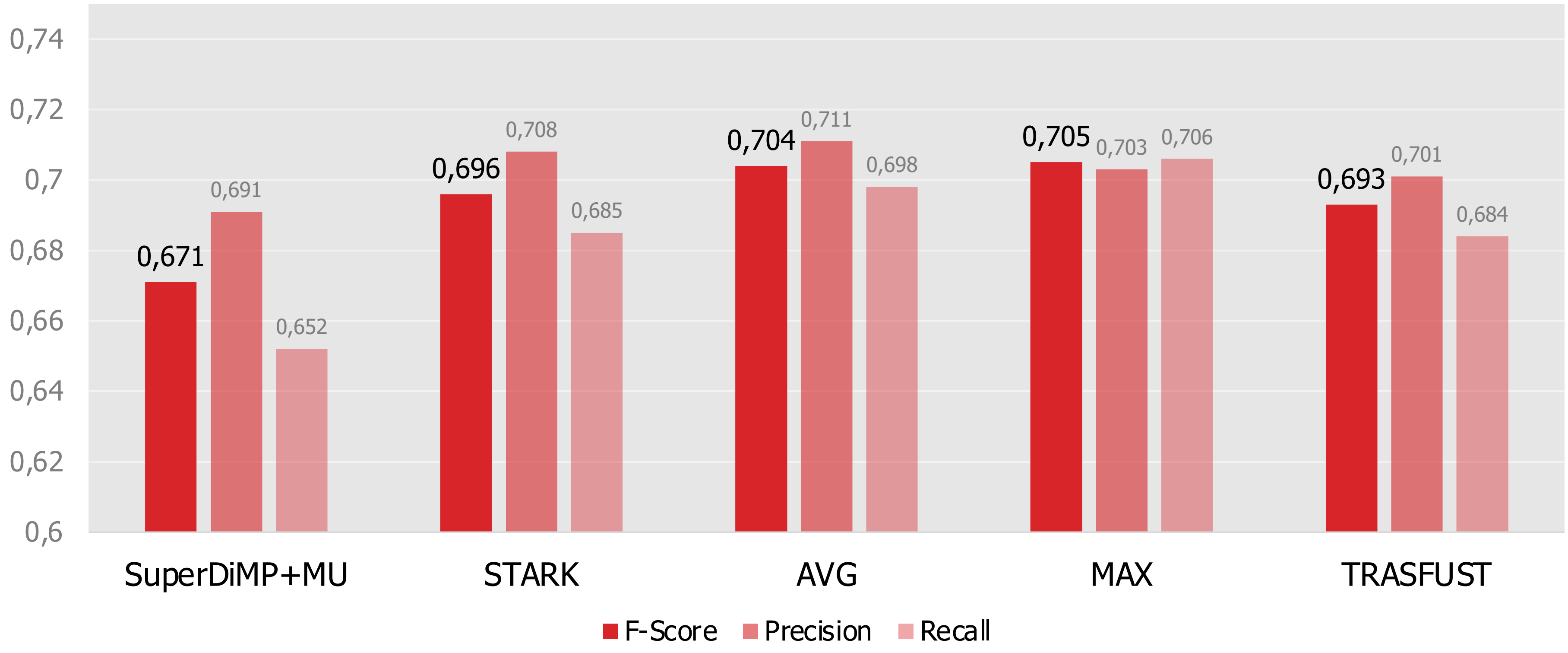
Fusion Baselines - Max

Fusion Baselines - TRASFUST

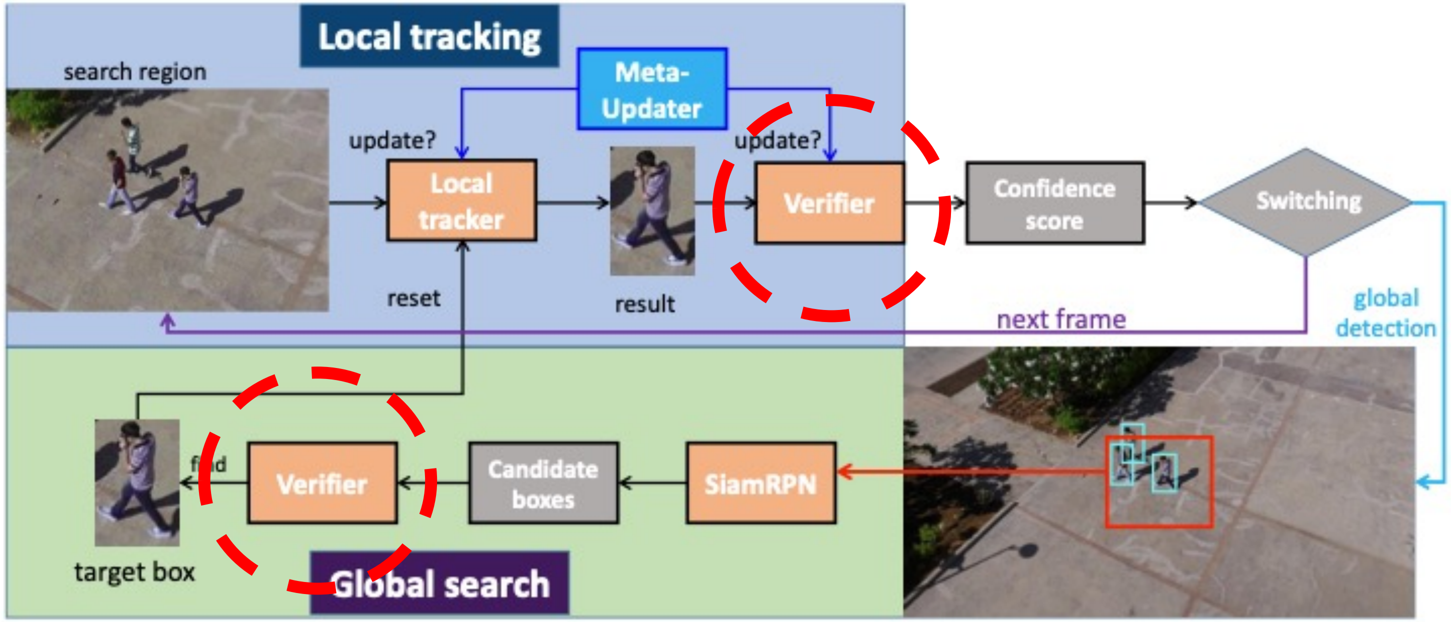


[3] **‘Tracking-by-Trackers with a Distilled and Reinforced Model’,** ACCV 2020

Fusion Baselines

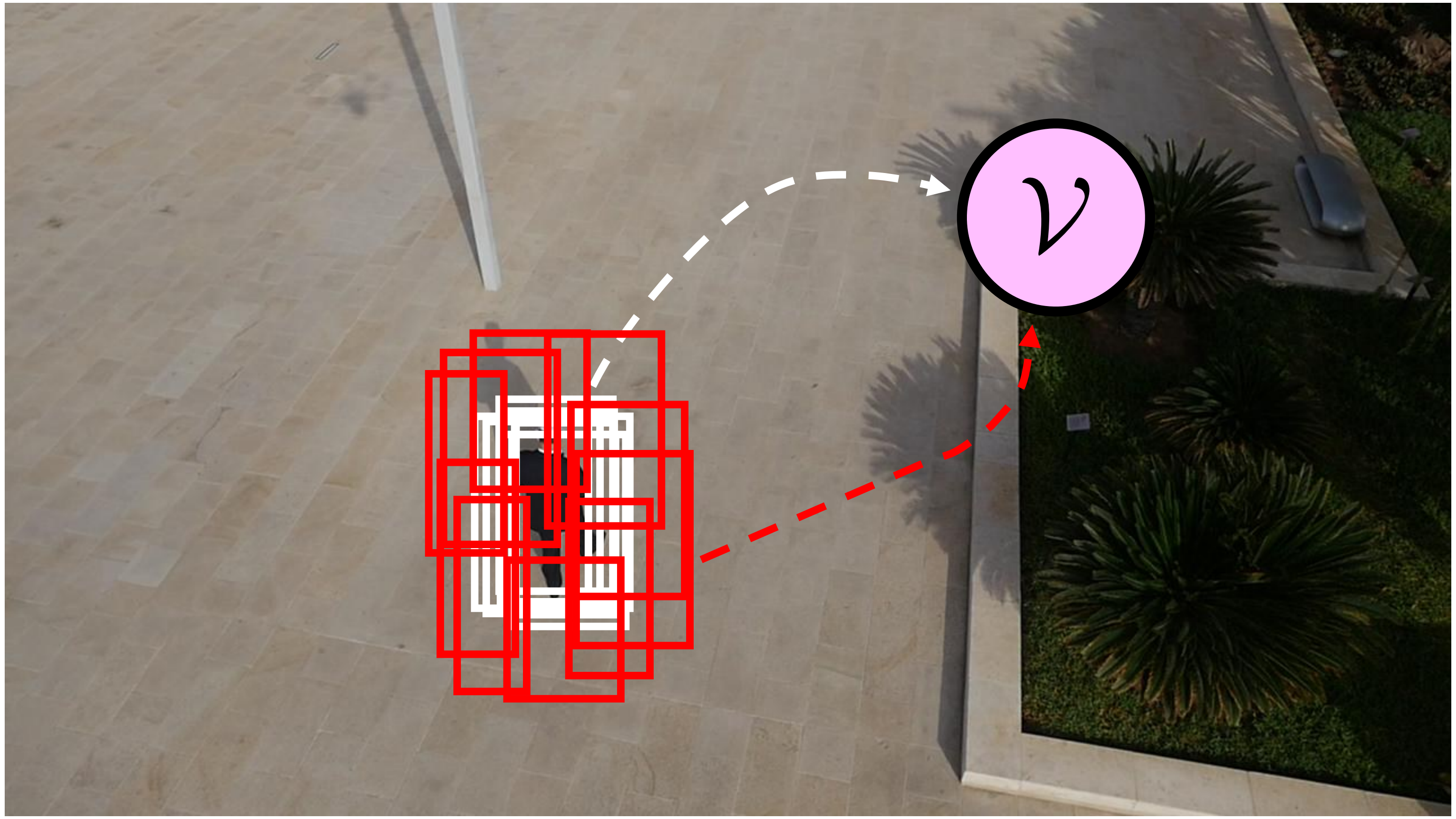


mlpLT - Verifier

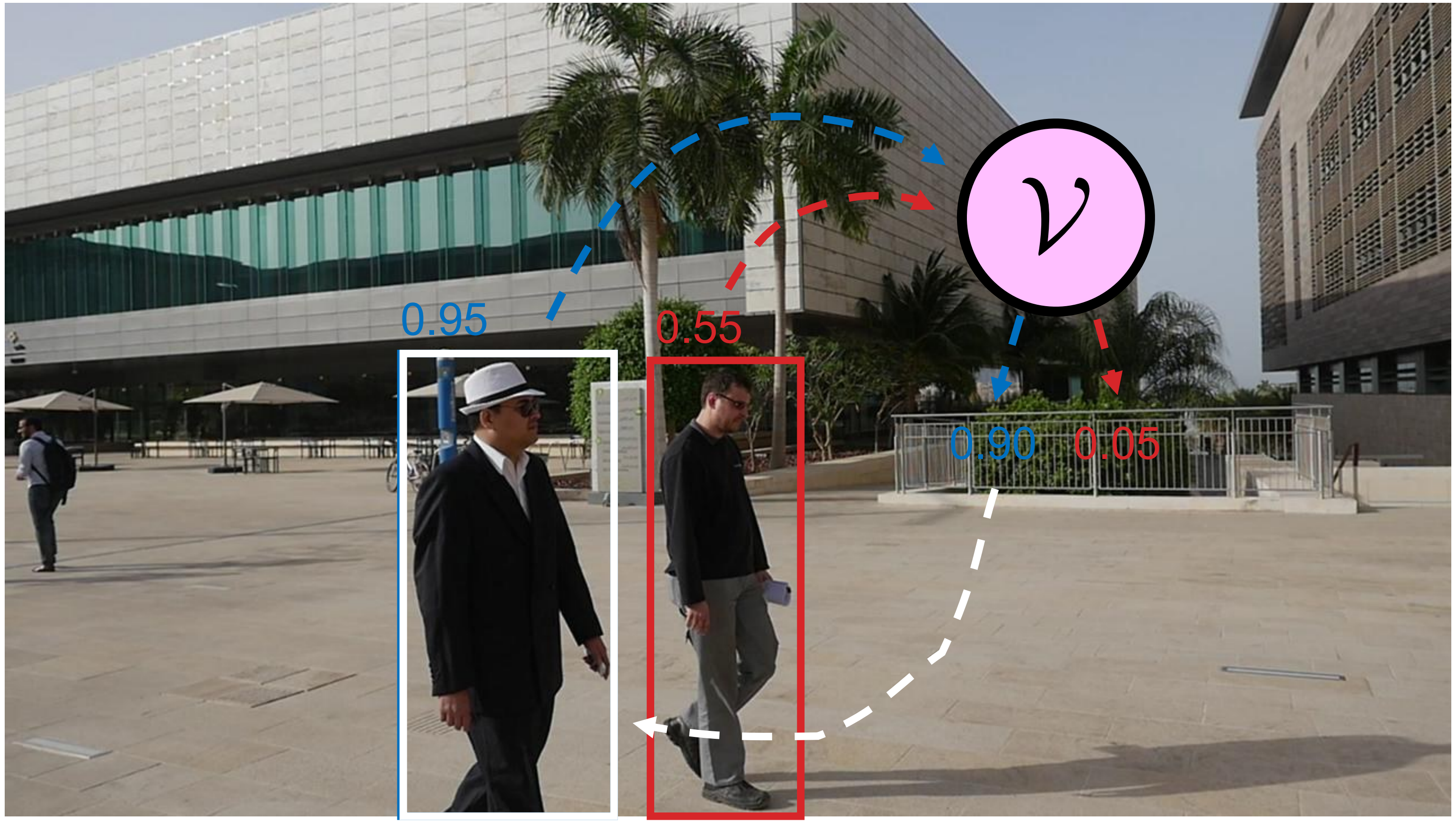


[4] **‘High-Performance Long-Term Tracking with Meta-Updater’,** CVPR 2020

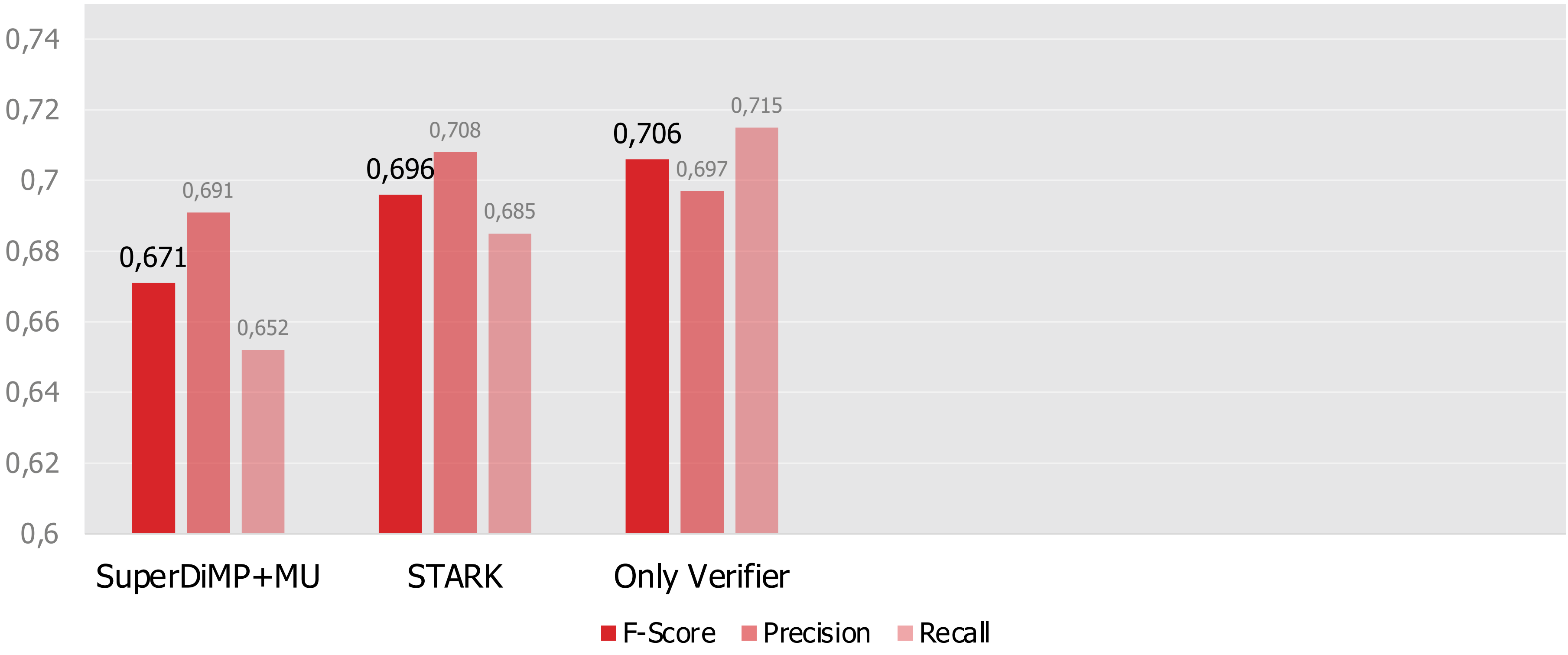
mlpLT – Verifier initialization



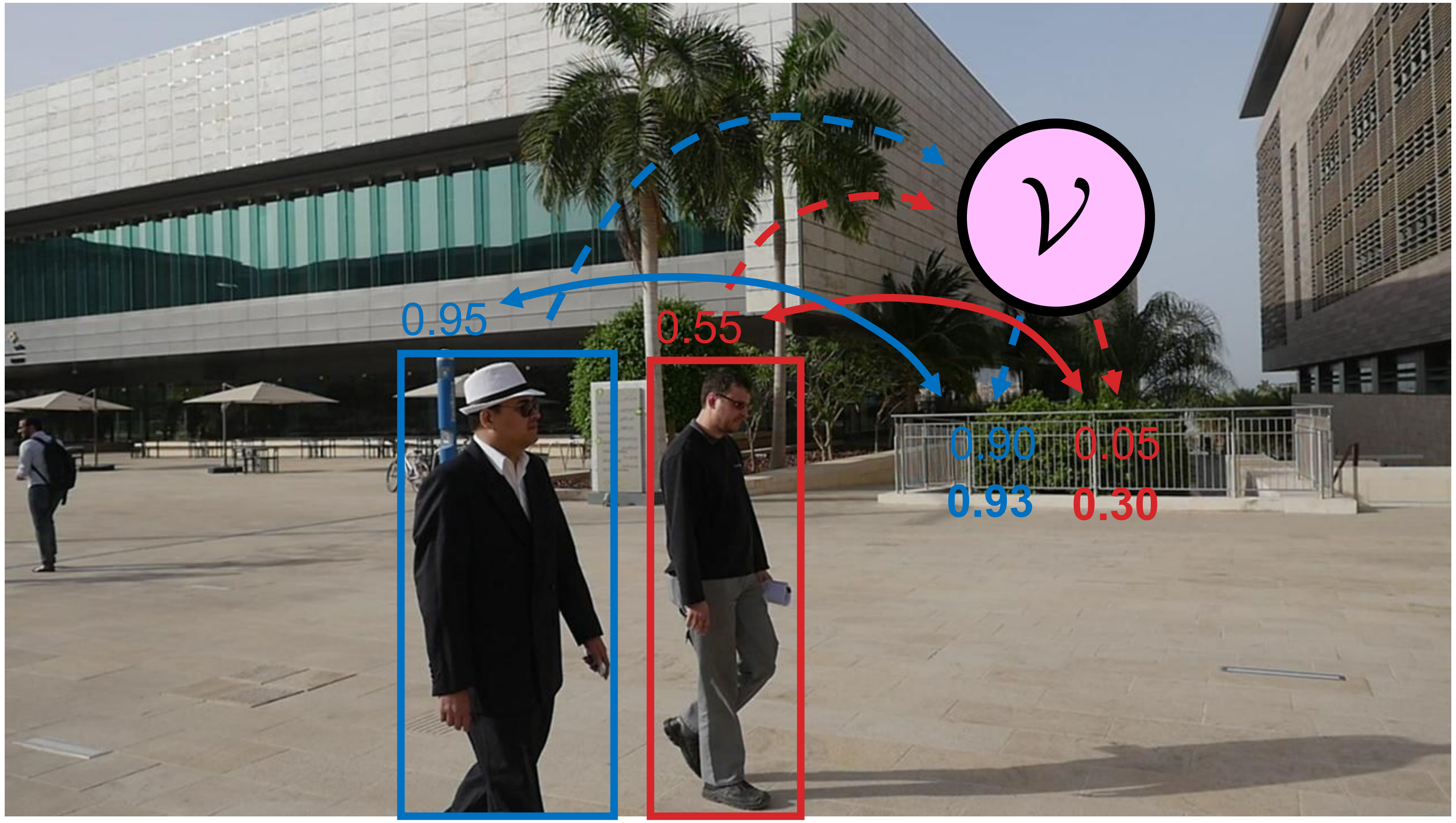
mlpLT – Target Verification



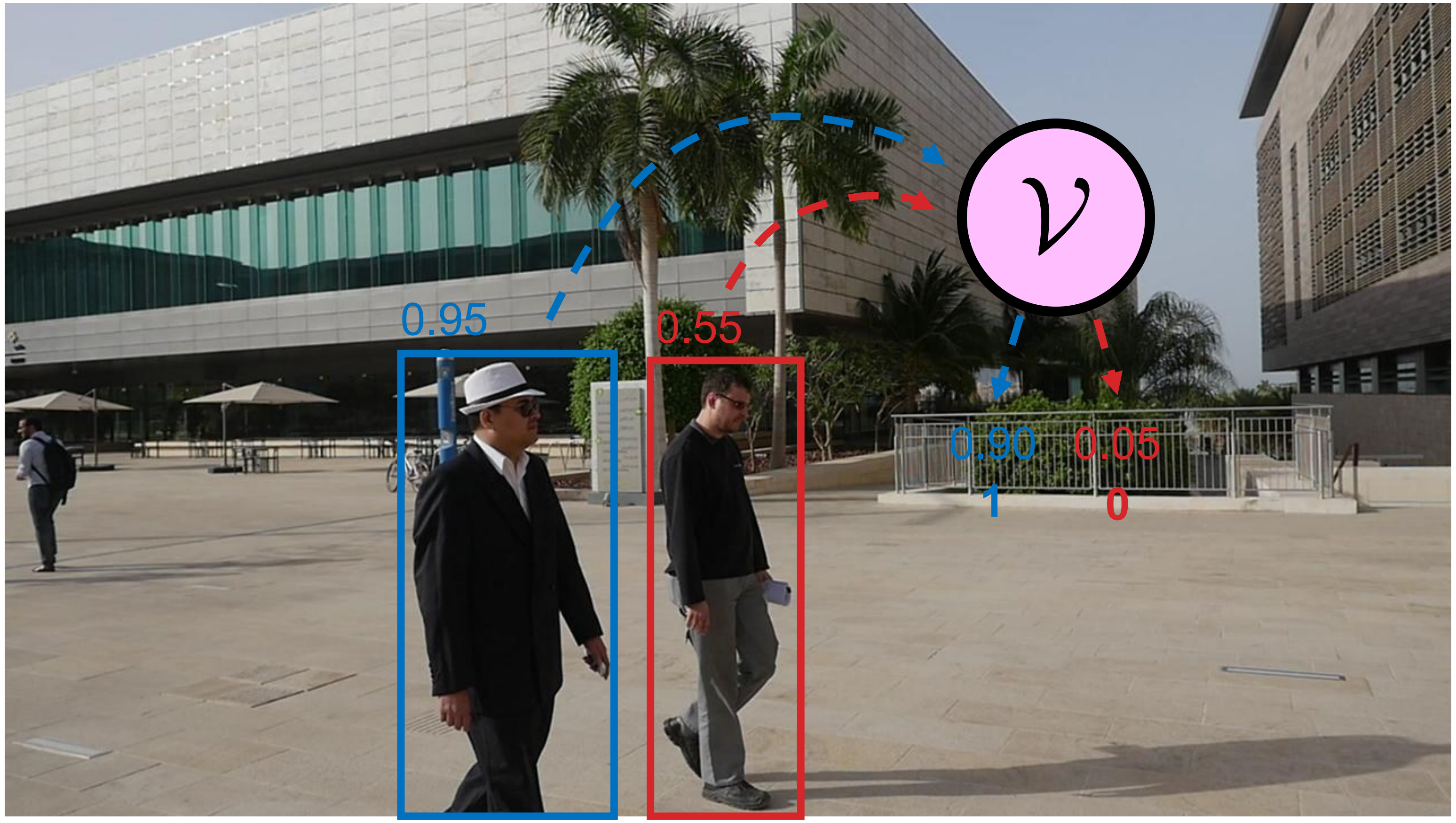
Results


0,74
0,72
0,7
0,68
0,66
0,64
0,62
0,6
0,671
0,691
0,652
0,696
0,708
0,685
0,706
0,697
0,715
SuperDiMP+MU
STARK
Only Verifier
F-Score
Precision
Recall

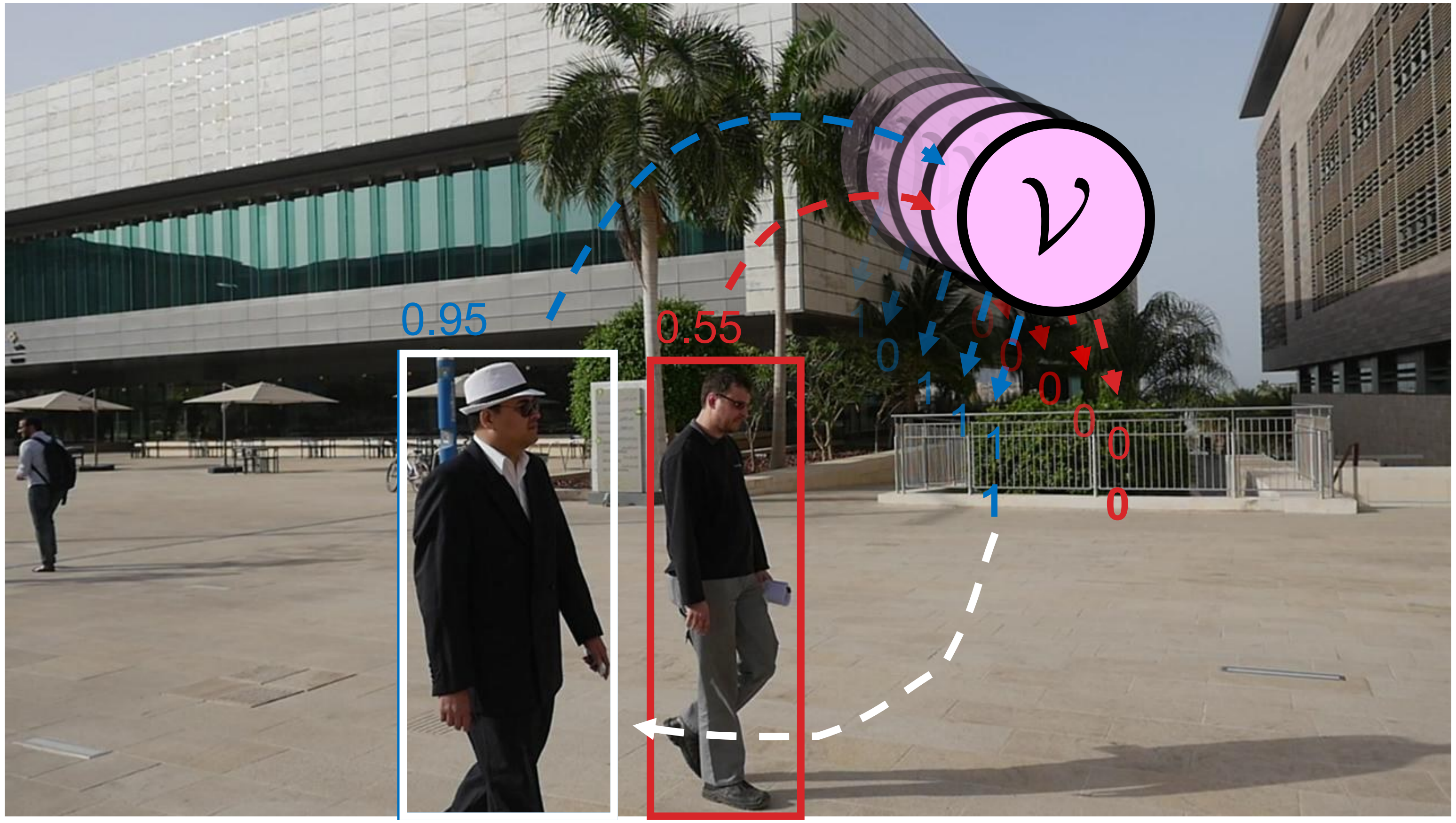
mlpLT – Confidence Combination



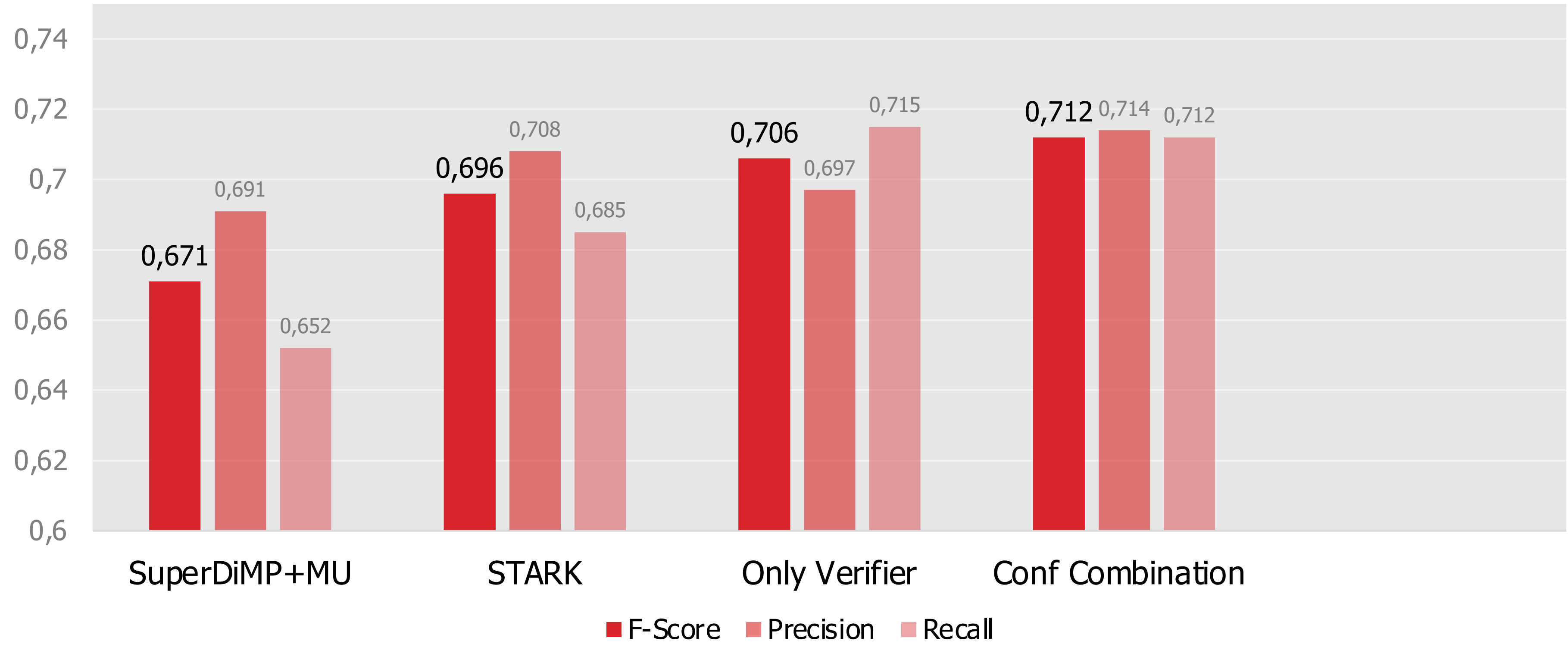
mlpLT - Confidence Thresholding



mlpLT - Confidence Over Frames



Results



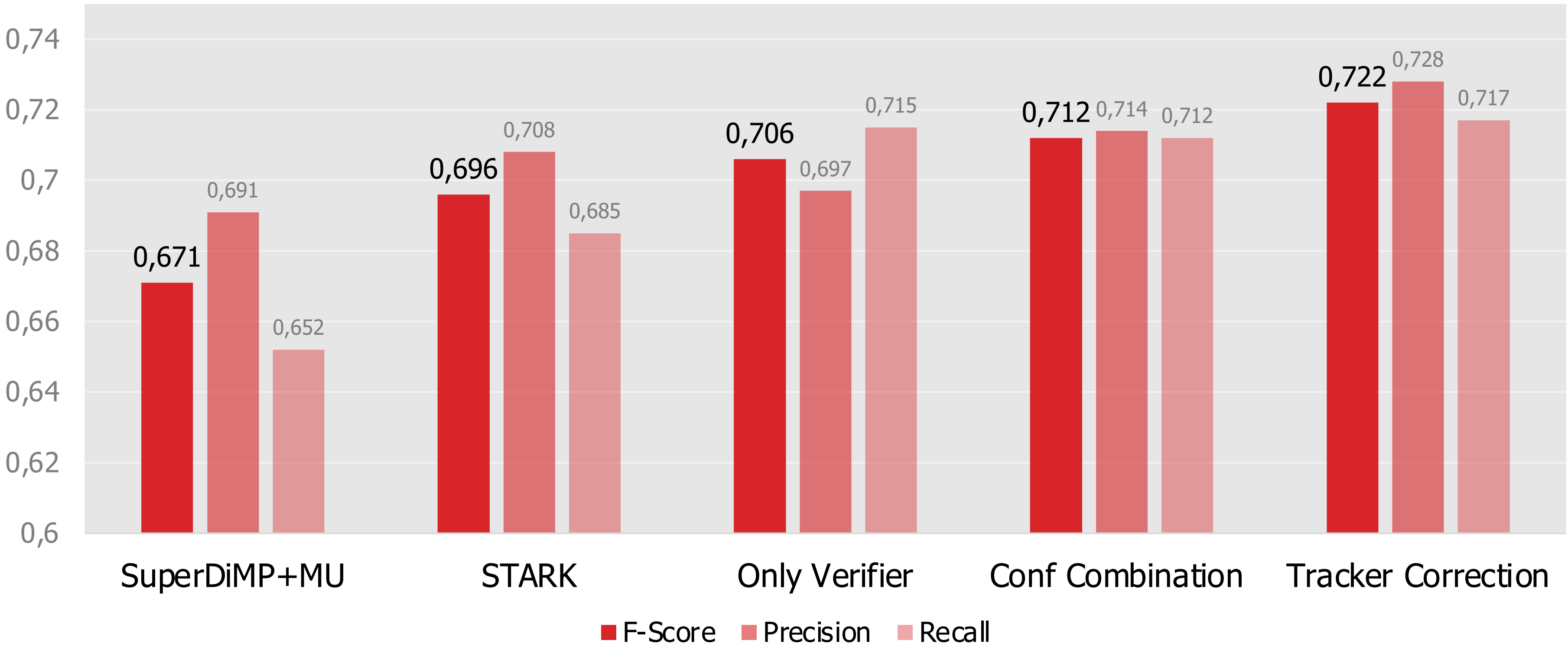
0,74
0,72
0,7
0,68
0,66
0,64
0,62
0,6
0,671
0,691
0,652
0,696
0,708
0,685
0,706
0,697
0,715
0,712
0,714
0,712
SuperDiMP+MU
STARK
Only Verifier
Conf Combination
F-Score
Precision
Recall

mlpLT – Tracker Correction

mlpLT – Tracker Correction

mlpLT – Tracker Correction

Results


0,74
0,72
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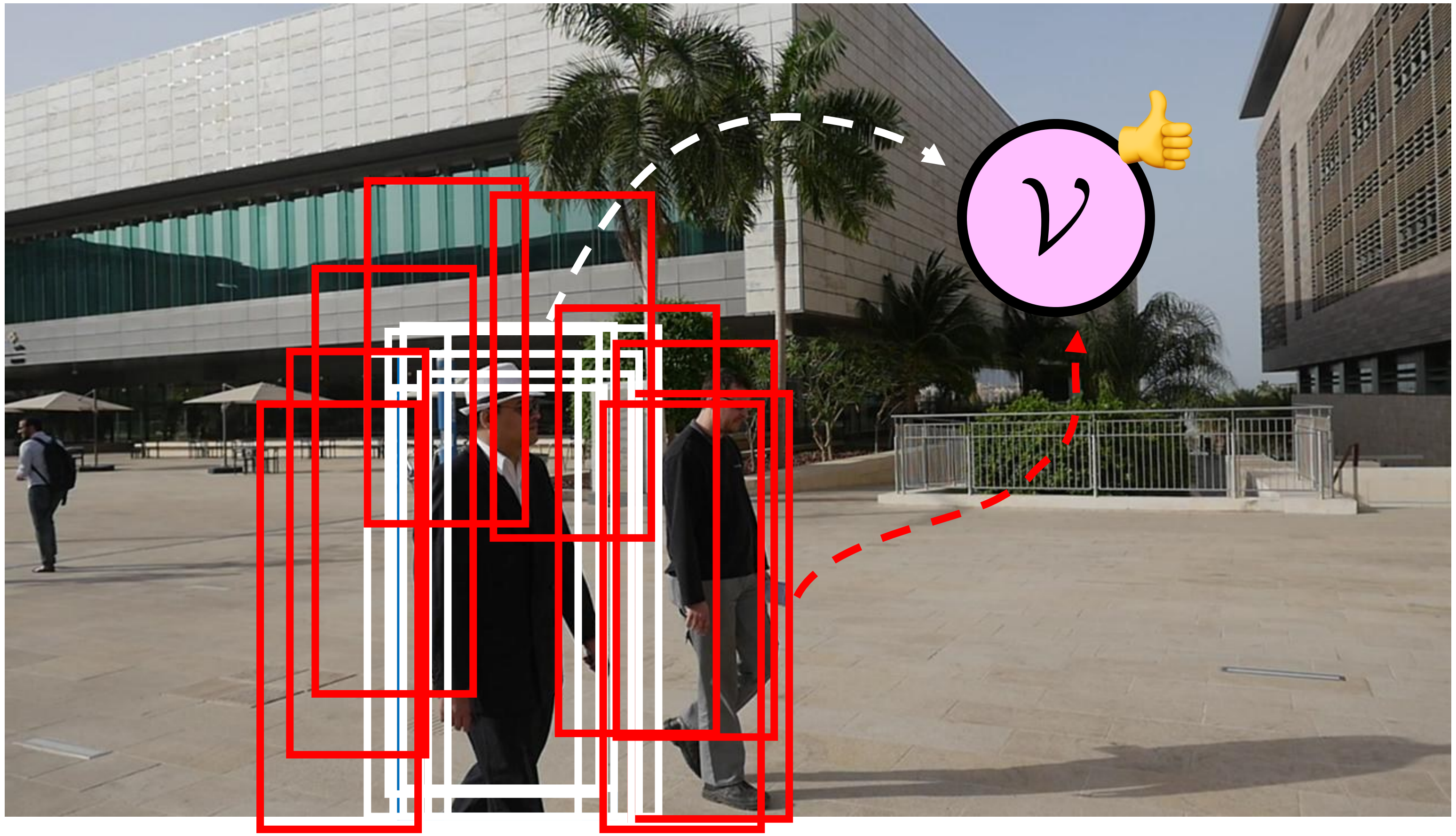
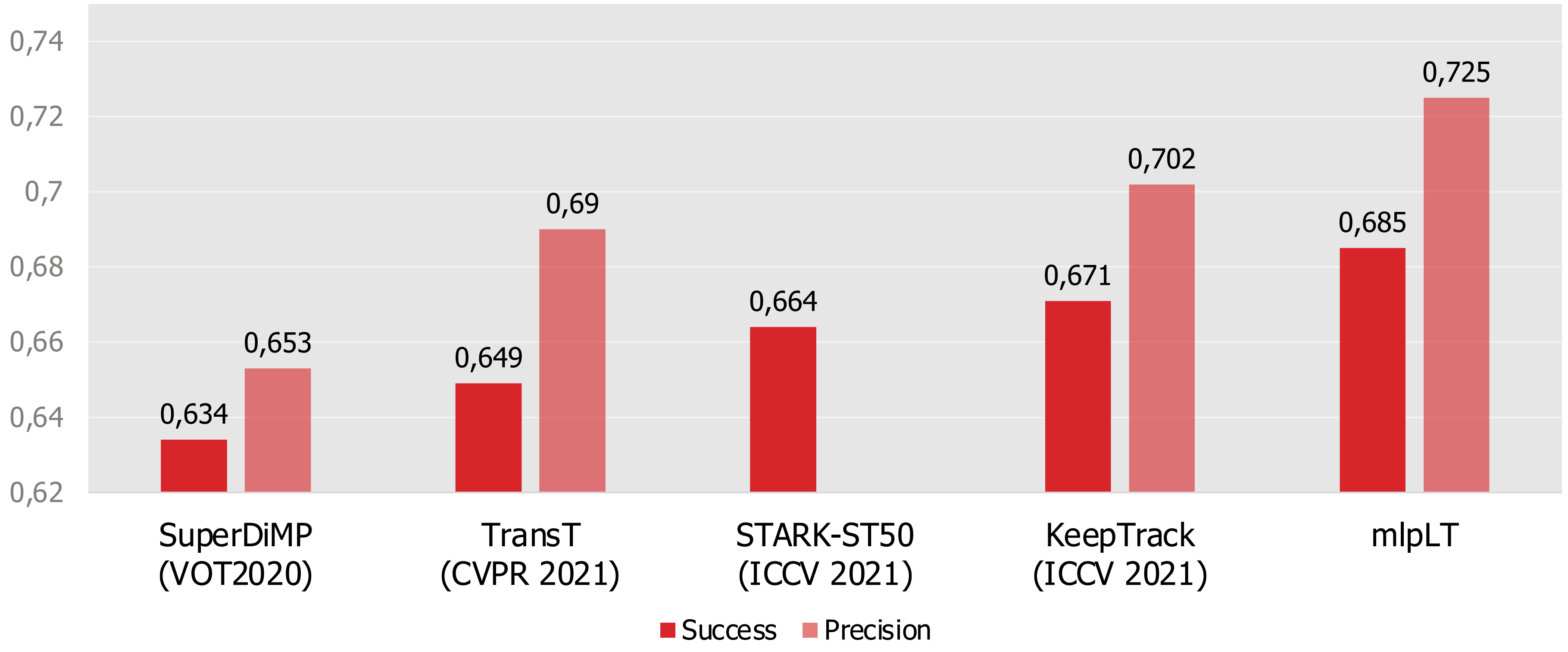
0,64
0,62
0,6
0,671
0,691
0,652
0,696
0,708
0,685
0,706
0,697
0,715
0,712
0,714
0,712
0,722
0,728
0,717
SuperDiMP+MU
STARK
Only Verifier
Conf Combination
Tracker Correction
F-Score
Precision
Recall

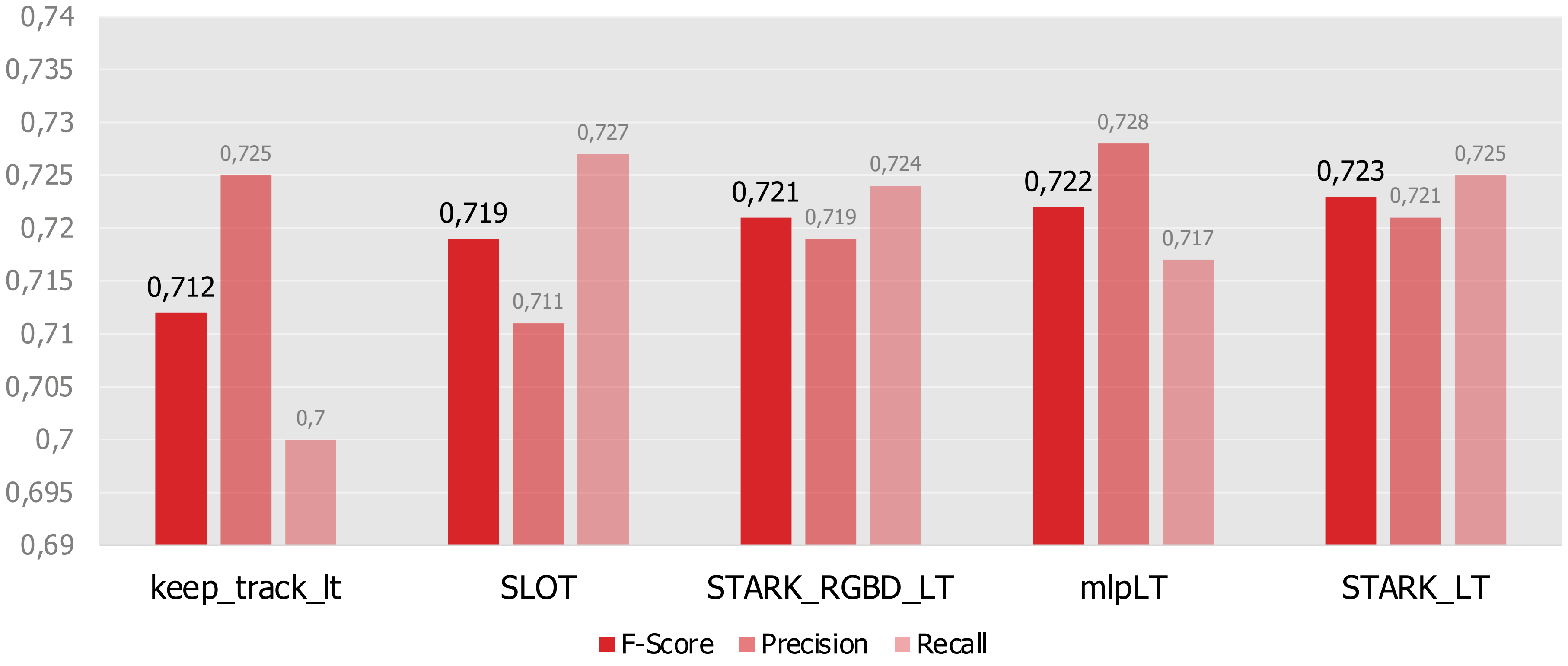
mlpLT – Online Update



Results - LaSOT



Results – VOTLT2021



mlpLT – Improvements to STARK

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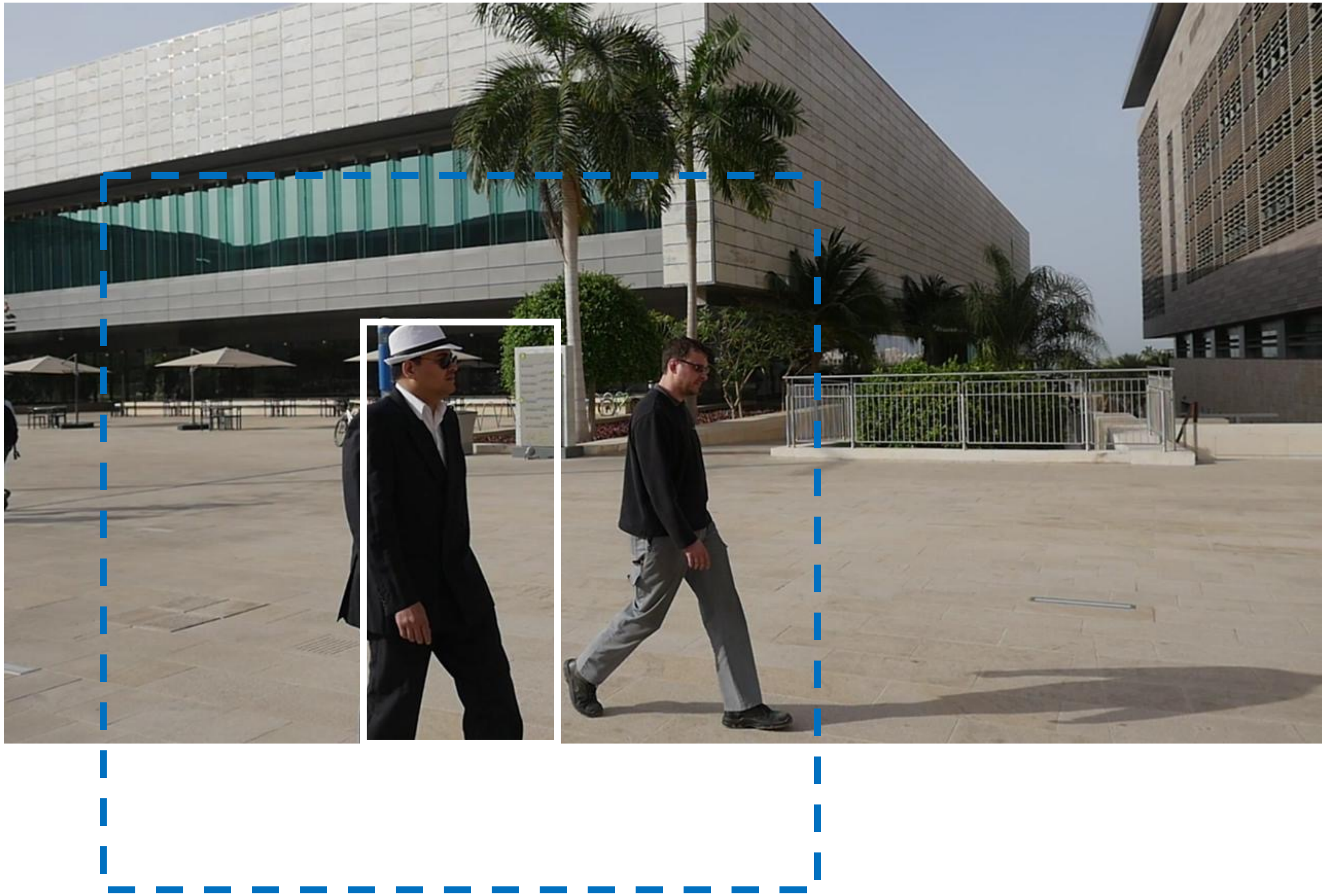
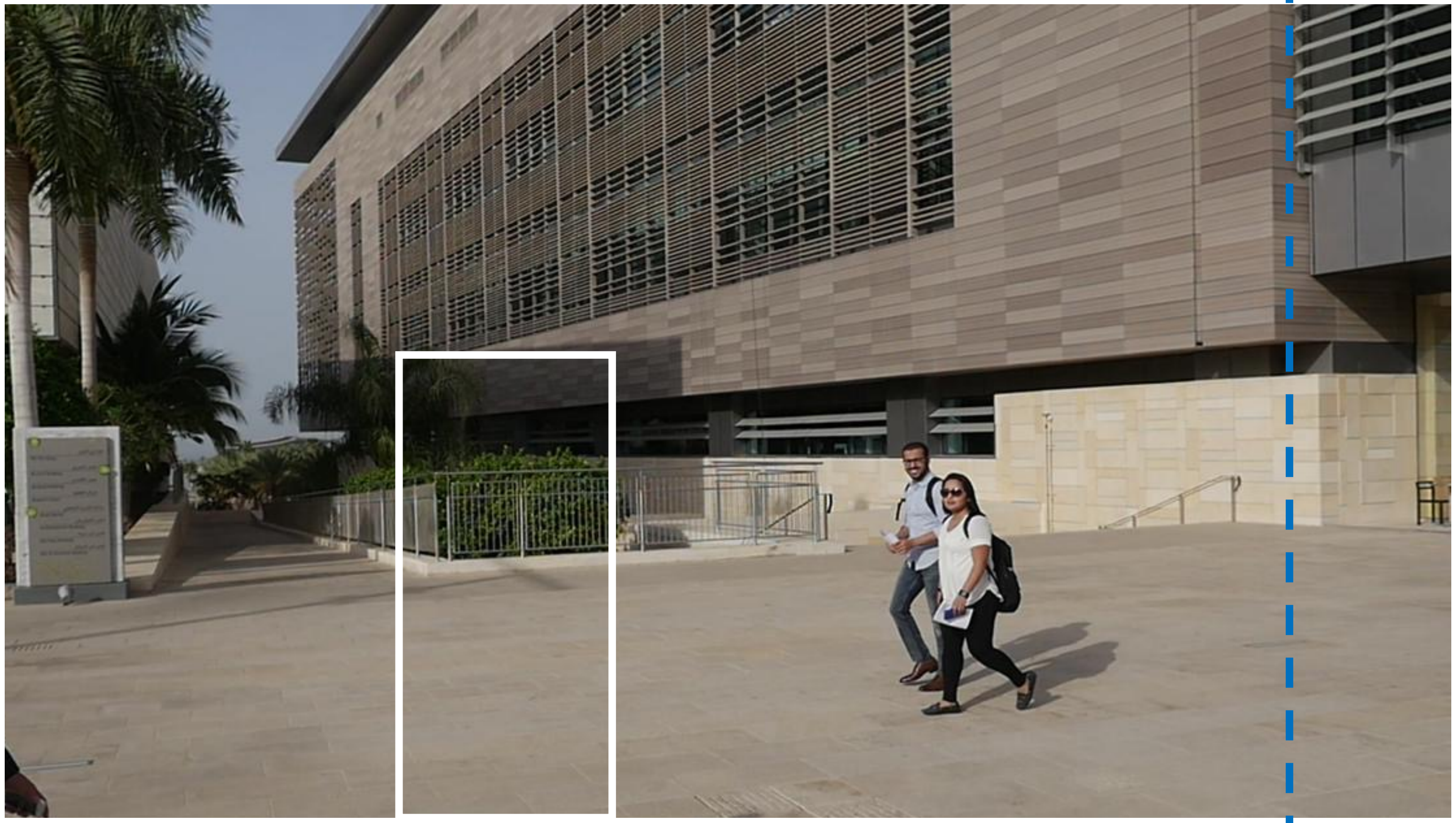


mlpLT – Improvements to STARK



mlpLT – Improvements to STARK

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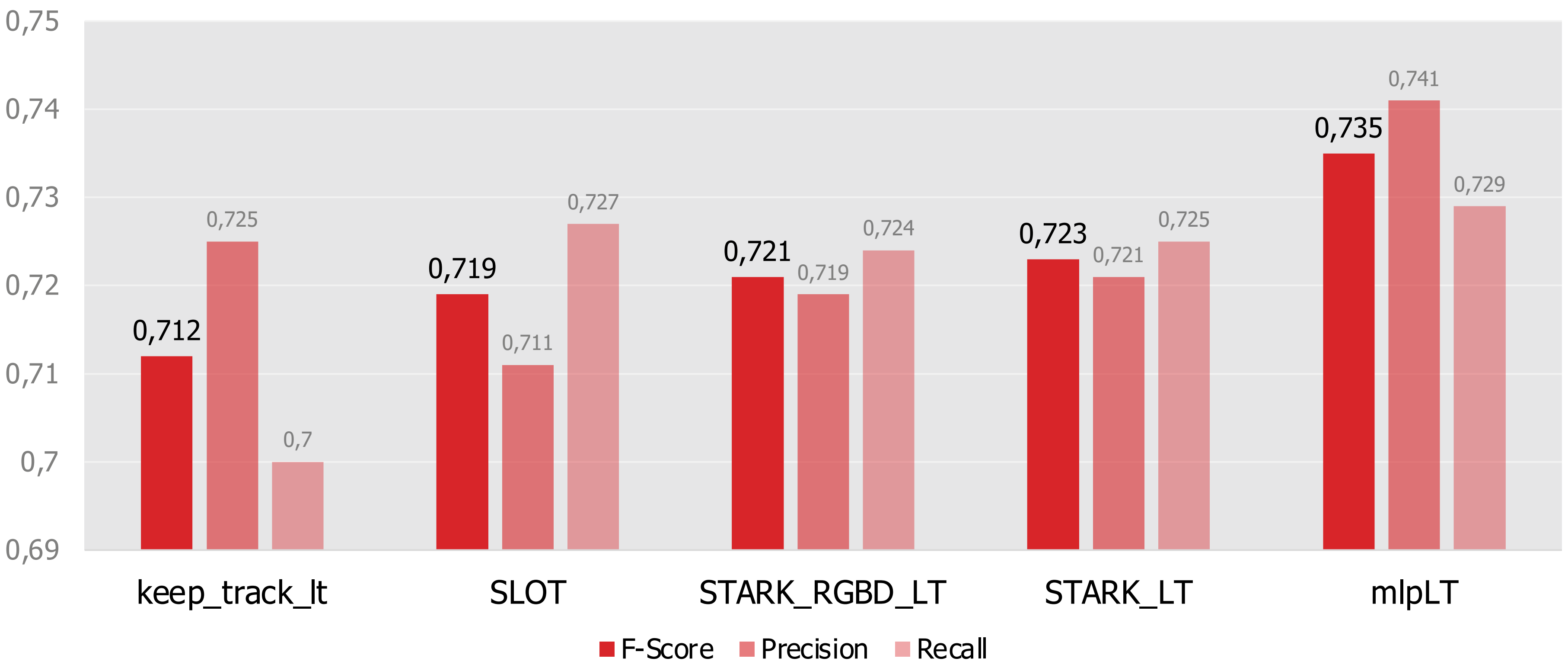
Results – VOTLT2021



Thank you!