ICCV HONOLULU HAWAII
OCT 19-23, 2025

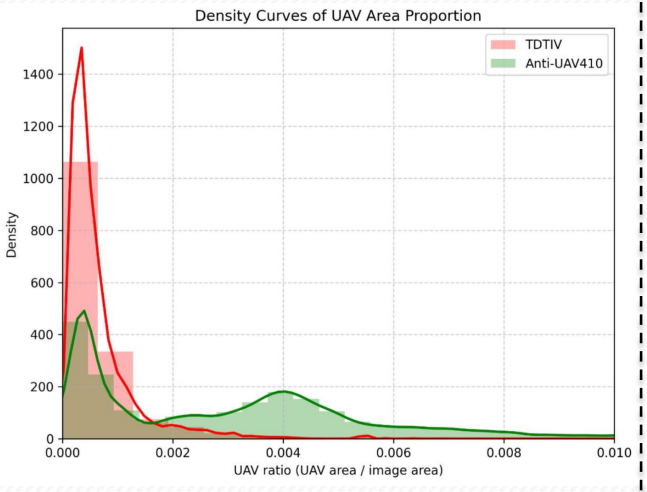
Tracking Tiny Drones against Clutter: Large-Scale Infrared Benchmark with Motion-Centric Adaptive Algorithm

Jiahao Zhang Zongli Jiang Jinli Zhang Yixin Wei Liang Li Yizheng Wang Gang Wang

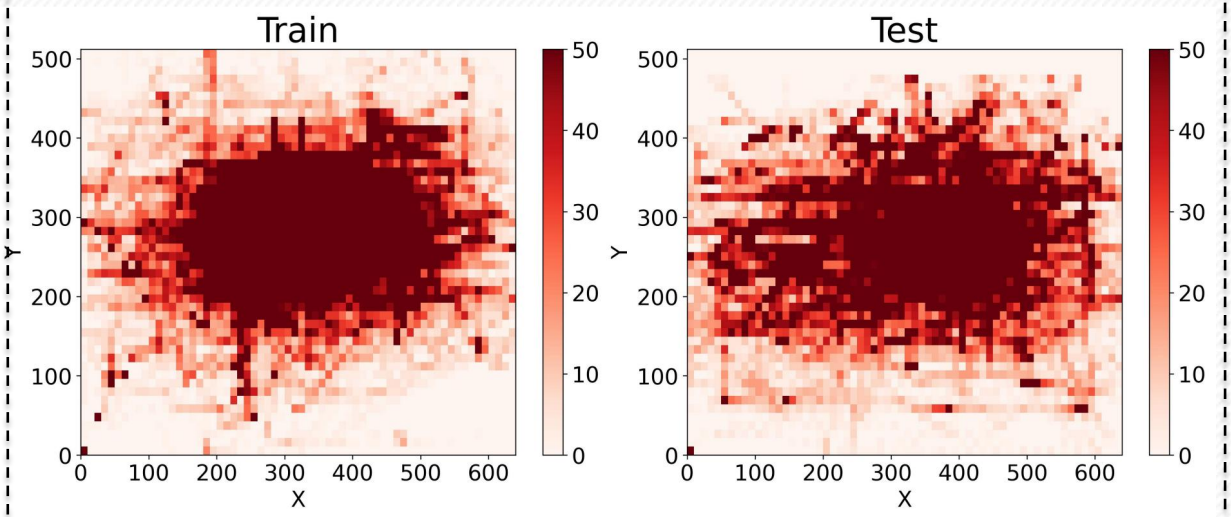
Dataset Question

Dataset Analysis

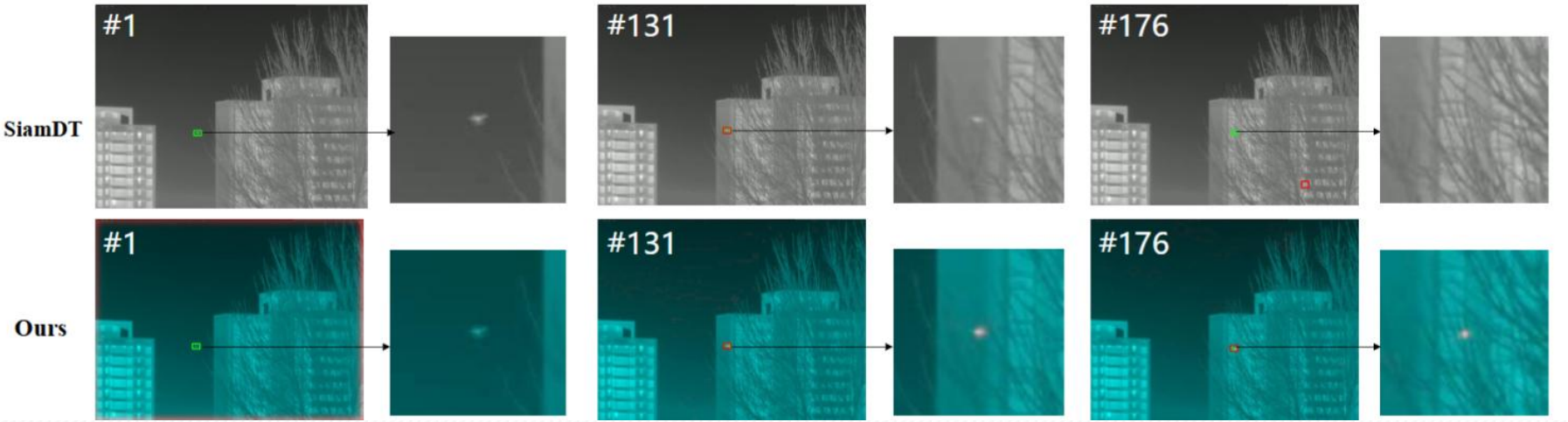
Size



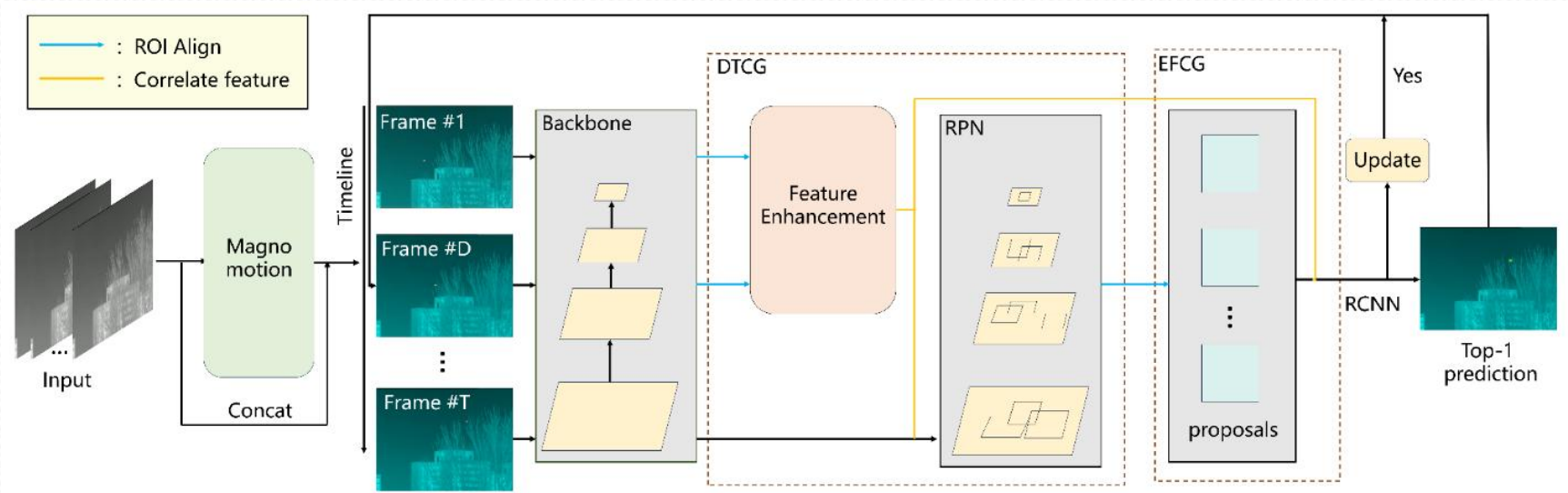
Position



Method Challenges



Method

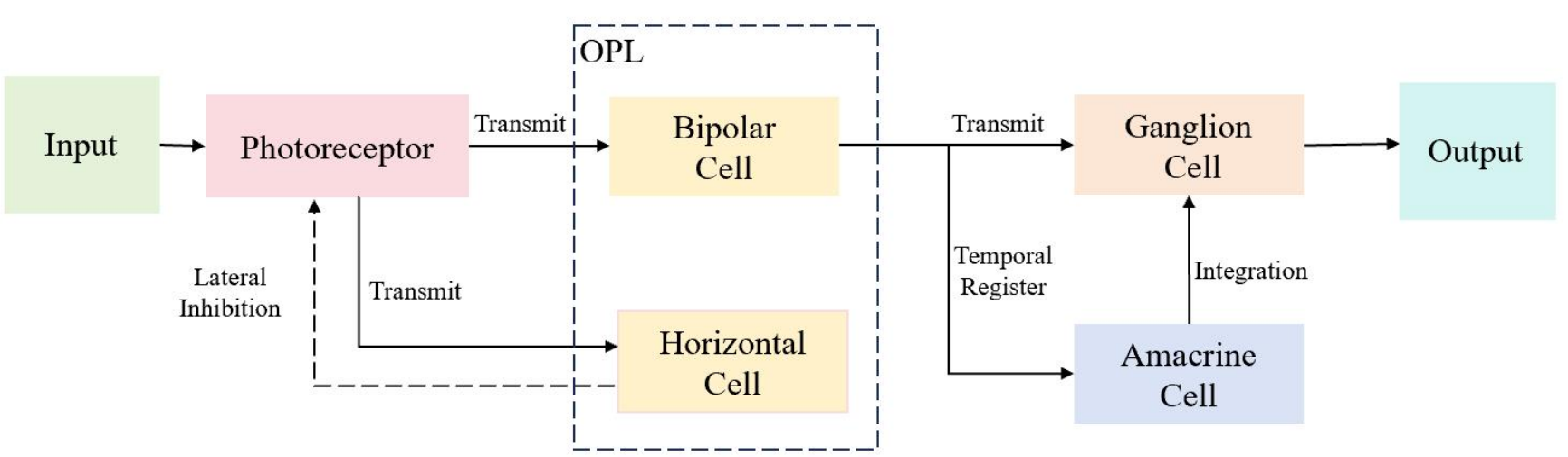


$$F = \text{Softmax}\left(\frac{QK^{\mathrm{T}}}{\sqrt{C}}\right) \cdot V$$

$$= \text{Softmax}\left(\frac{(\text{Conv}_{\text{q}}(z))(\text{Conv}_{\text{k}}(d))^{\mathrm{T}}}{\sqrt{C}}\right) \cdot (\text{Conv}_{\text{v}}(d))$$

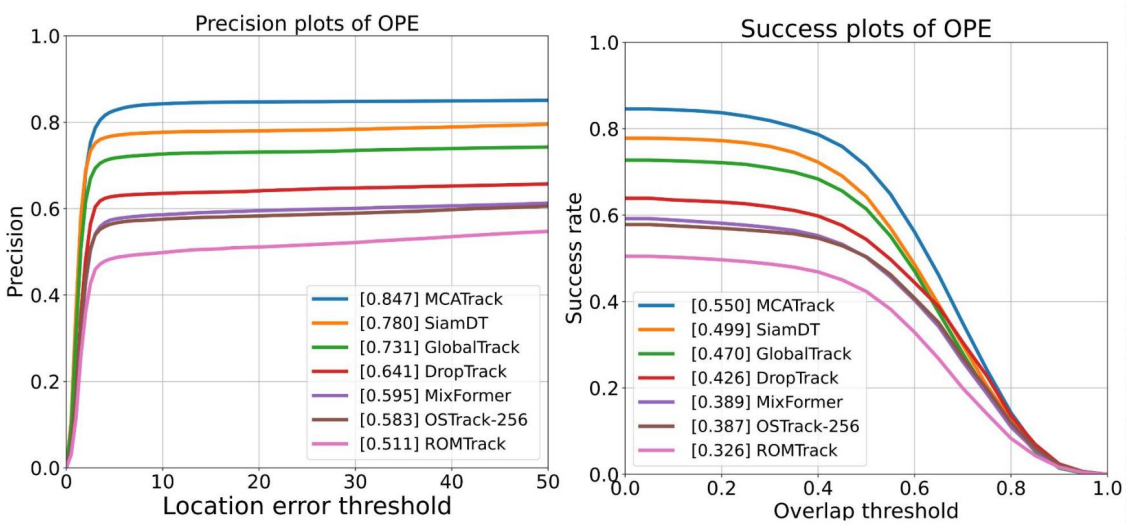
$$z_r = \gamma F + z$$

Magno motion



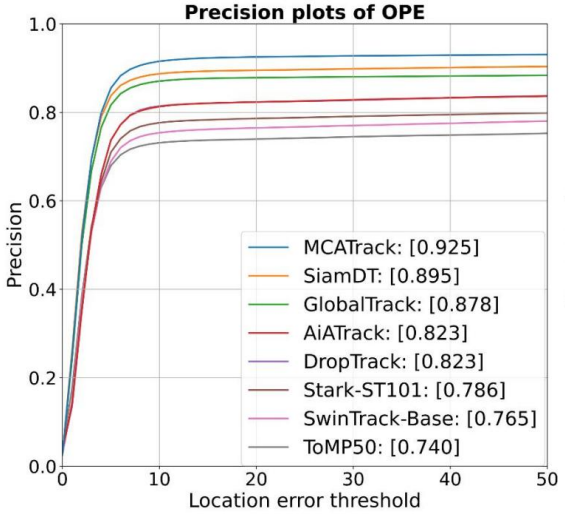
TDTIV Result

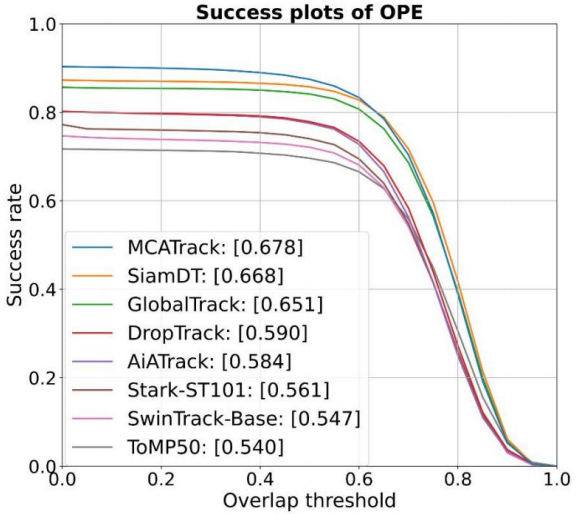
Methods	Source	SA
GlobalTrack[21]	AAAI20	46.98
Stark-ST50[47]	ICCV21	41.16
Stark-ST101[47]	ICCV21	37.98
TOMP50[30]	CVPR22	37.19
TOMP101[30]	CVPR22	39.49
SimTrack[6]	ECCV22	32.53
OSTrack-256[49]	ECCV22	38.81
OSTrack-384[49]	ECCV22	44.62
MixFormer[9]	CVPR22	38.97
GRM[15]	CVPR23	37.99
DropTrack[43]	CVPR23	42.70
ROMTrack[4]	ICCV23	32.66
ARTrack[42]	CVPR23	36.29
ODTrack[51]	AAAI24	35.37
EVPTrack[33]	AAAI24	39.58
TaMOs-ResNet50[31]	WACV24	32.28
TaMOs-Swin[31]	WACV24	36.70
AQATrack[44]	CVPR24	41.59
AVTrack[27]	ICML24	36.60
SiamDT[19]	TPAMI24	49.89
MCATrack		**54.97**



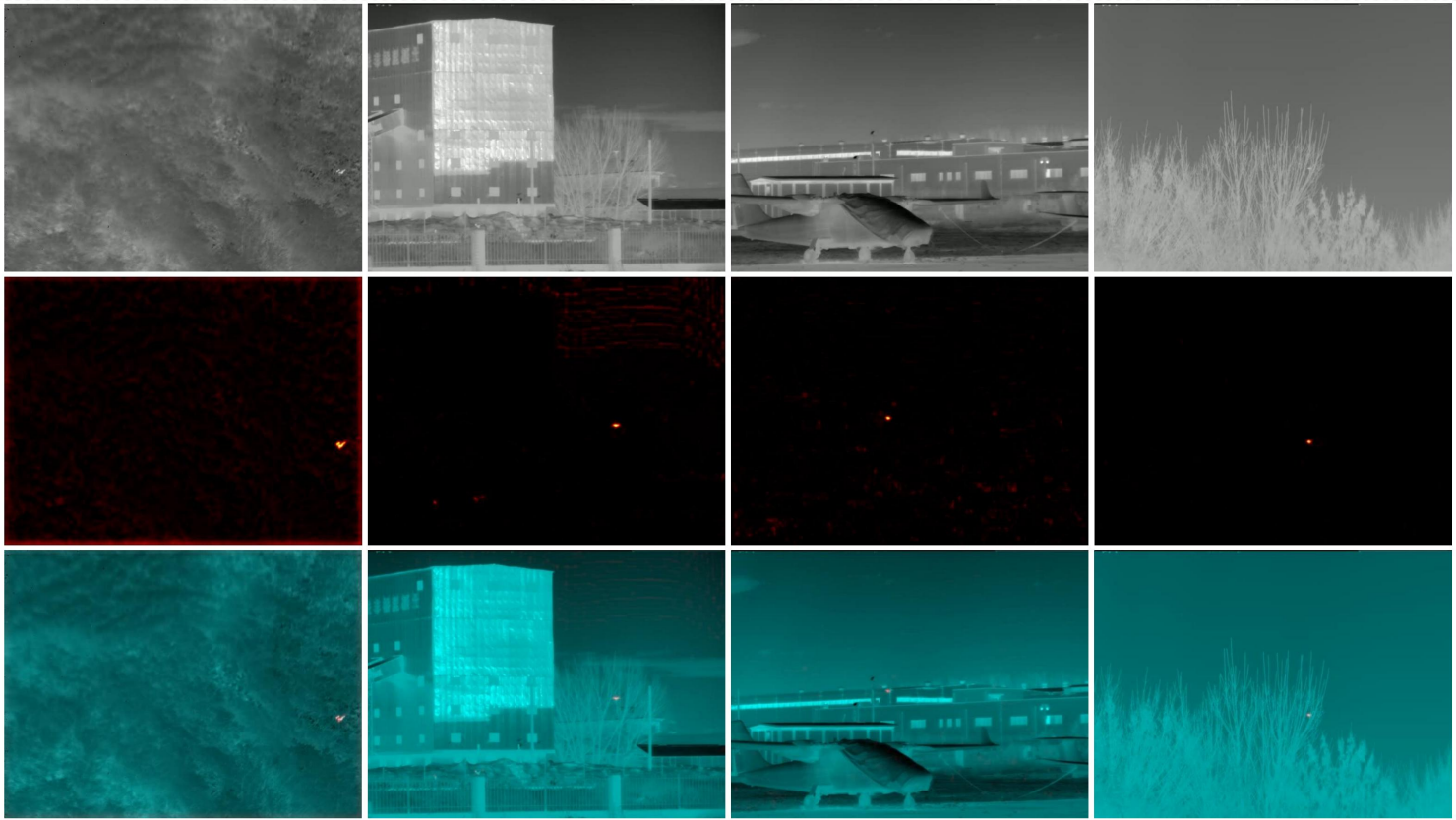
Anti-UAV410 Result

Methods	Source	SA
GlobalTrack[21]	AAAI20	66.45
PrDiMP50[11]	CVPR20	54.69
ROAM[48]	CVPR20	43.03
Siam R-CNN[38]	CVPR20	63.00
SiamBAN[8]	CVPR20	47.32
KYS[3]	ECCV20	44.90
KeepTrack[29]	ICCV21	56.80
Stark-ST101[47]	ICCV21	57.15
AiATrack[14]	ECCV22	59.56
OSTrack-256[49]	ECCV22	49.56
OSTrack-384[49]	ECCV22	60.08
ToMP50[30]	CVPR22	55.09
ToMP101[30]	CVPR22	55.10
TCTrack[5]	CVPR22	41.64
SwinTrack-Tiny[28]	NIPS22	53.15
SwinTrack-Base[28]	NIPS22	55.74
DropTrack[43]	CVPR23	60.15
ROMTrack[4]	ICCV23	46.81
MixFormerV2[10]	NIPS24	59.65
SiamDT[19]	TPAMI24	68.19
MCATrack		**69.18**

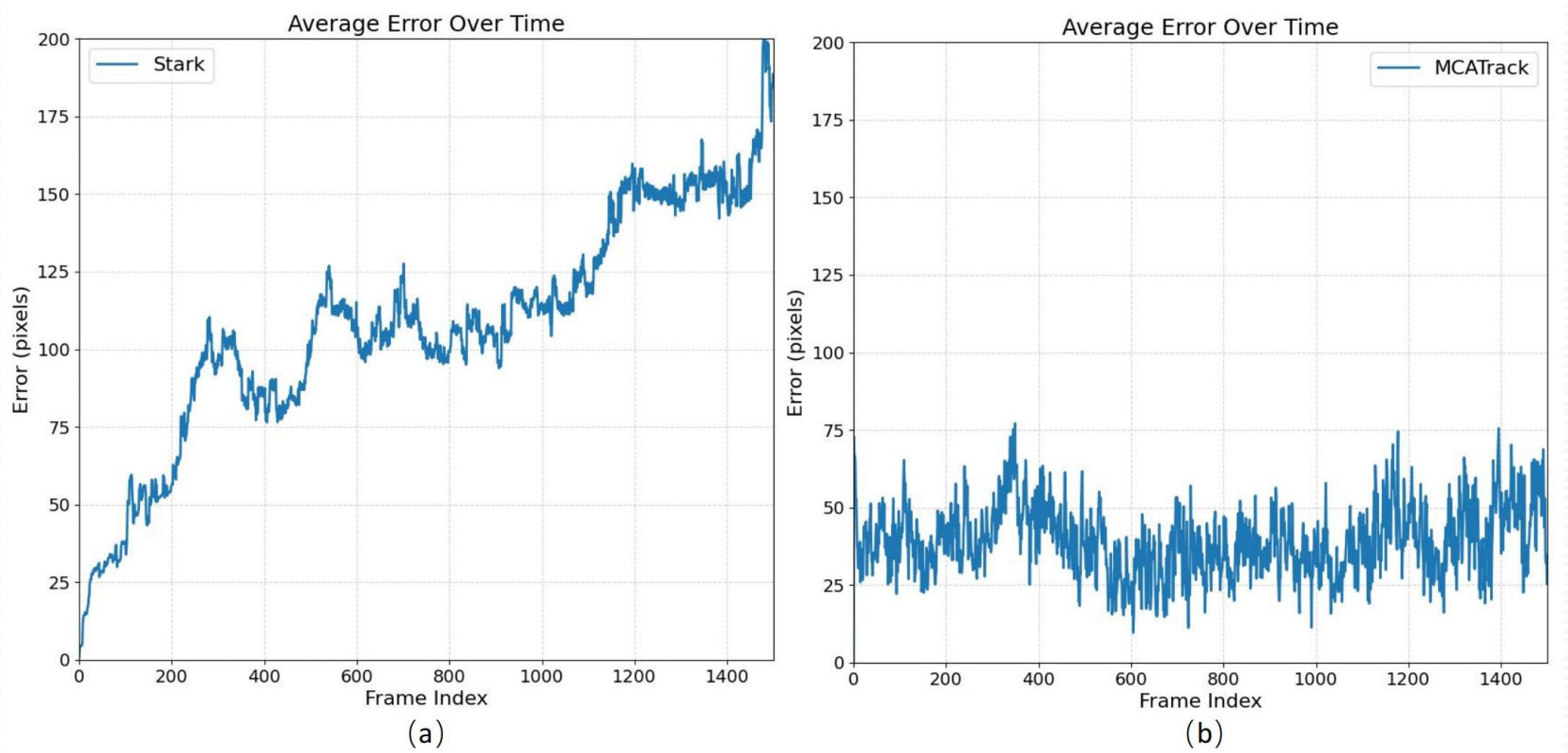




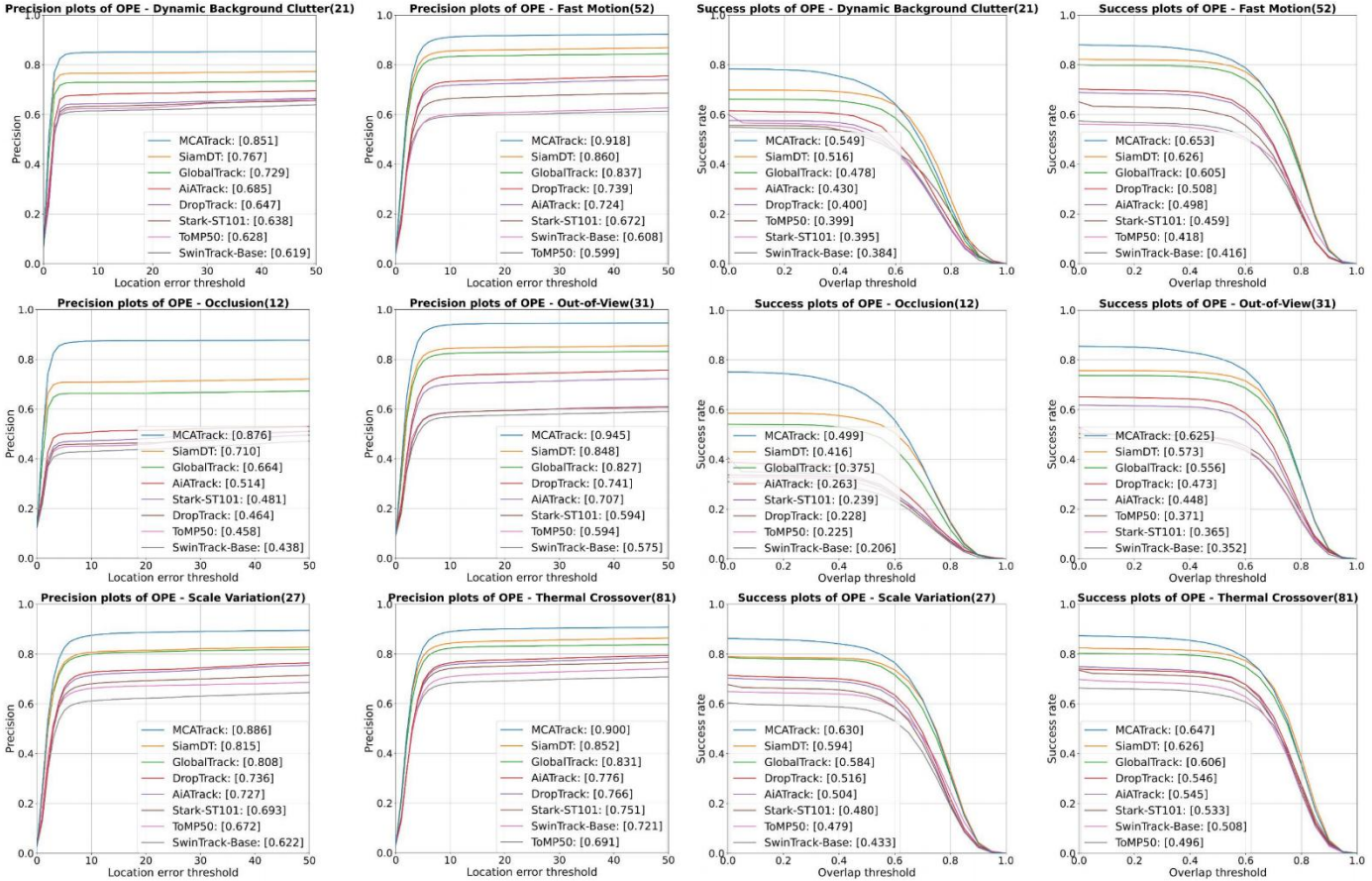
Motion Analysis



Long-term Tracking Analysis



Attribution Analysis



Size Analysis