清華大學 Tsinghua University

i-VisionGroup

Adversarial Transfer Networks for Visual Tracking



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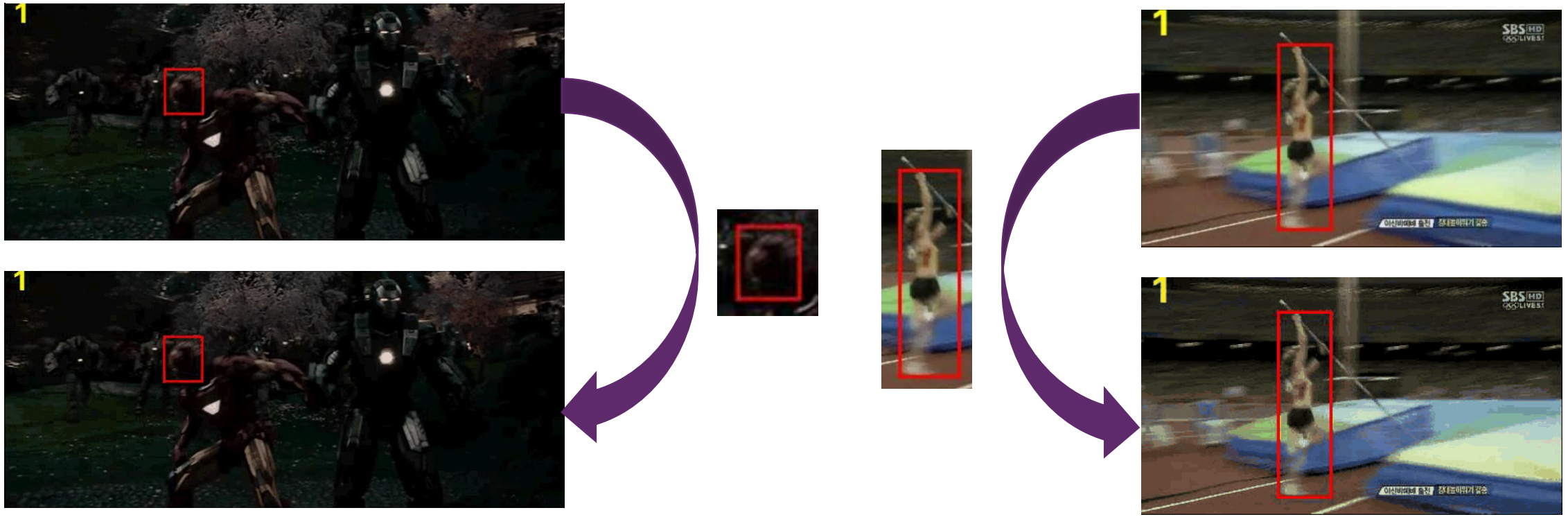
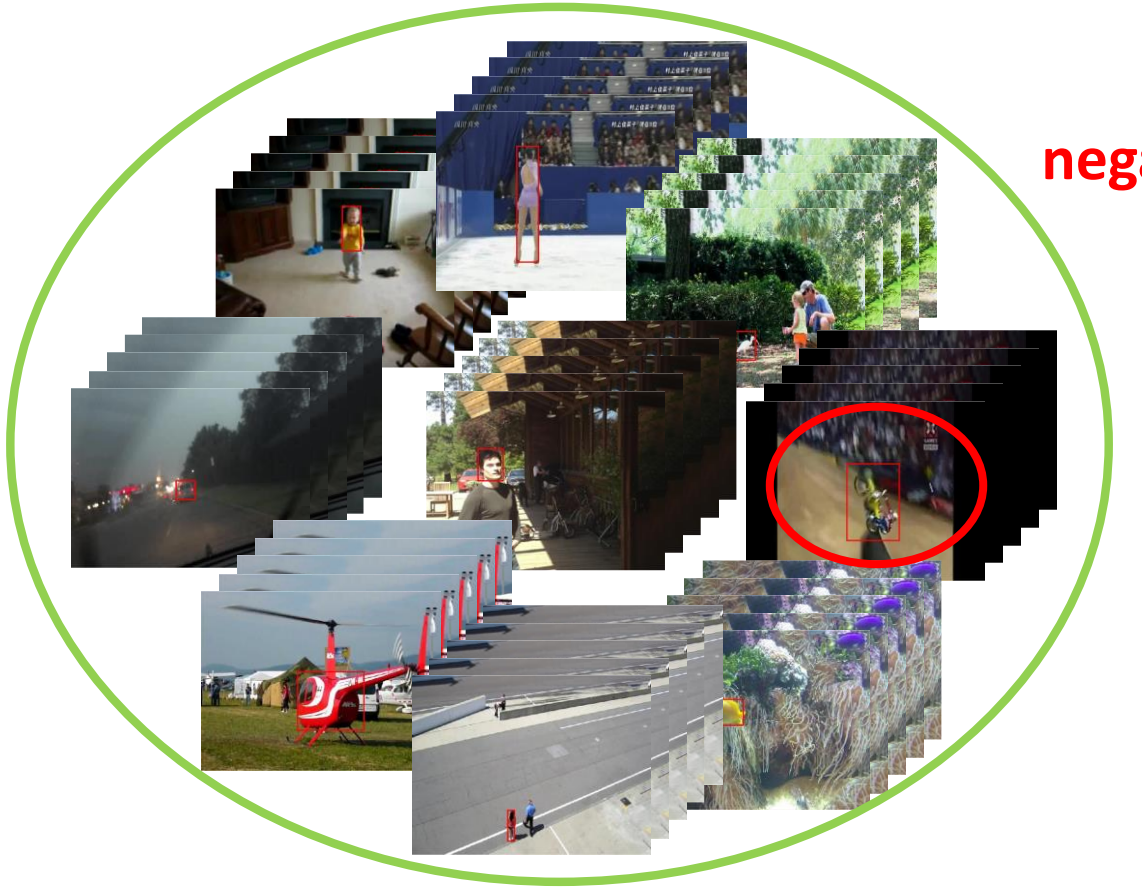
Challenges in Tracking Problem

- Different tracking objects
- Drastic appearance changes



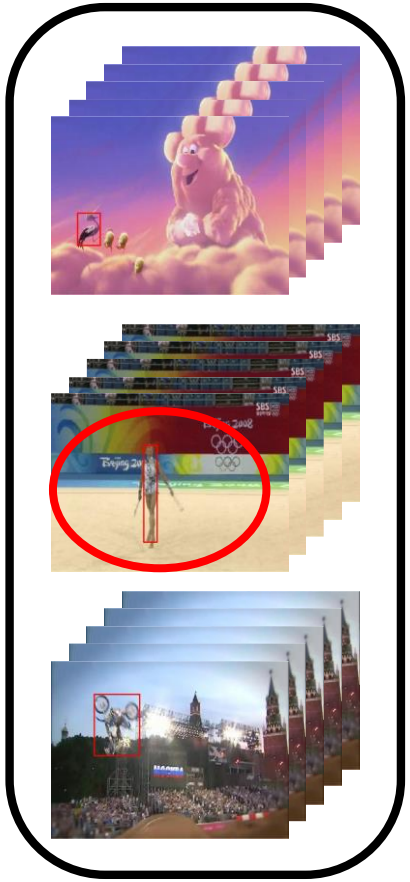
Deep Learning-based Tracking by Detection Framework

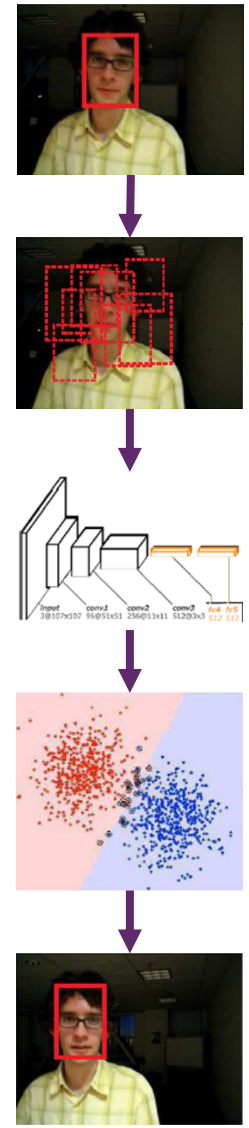
Training



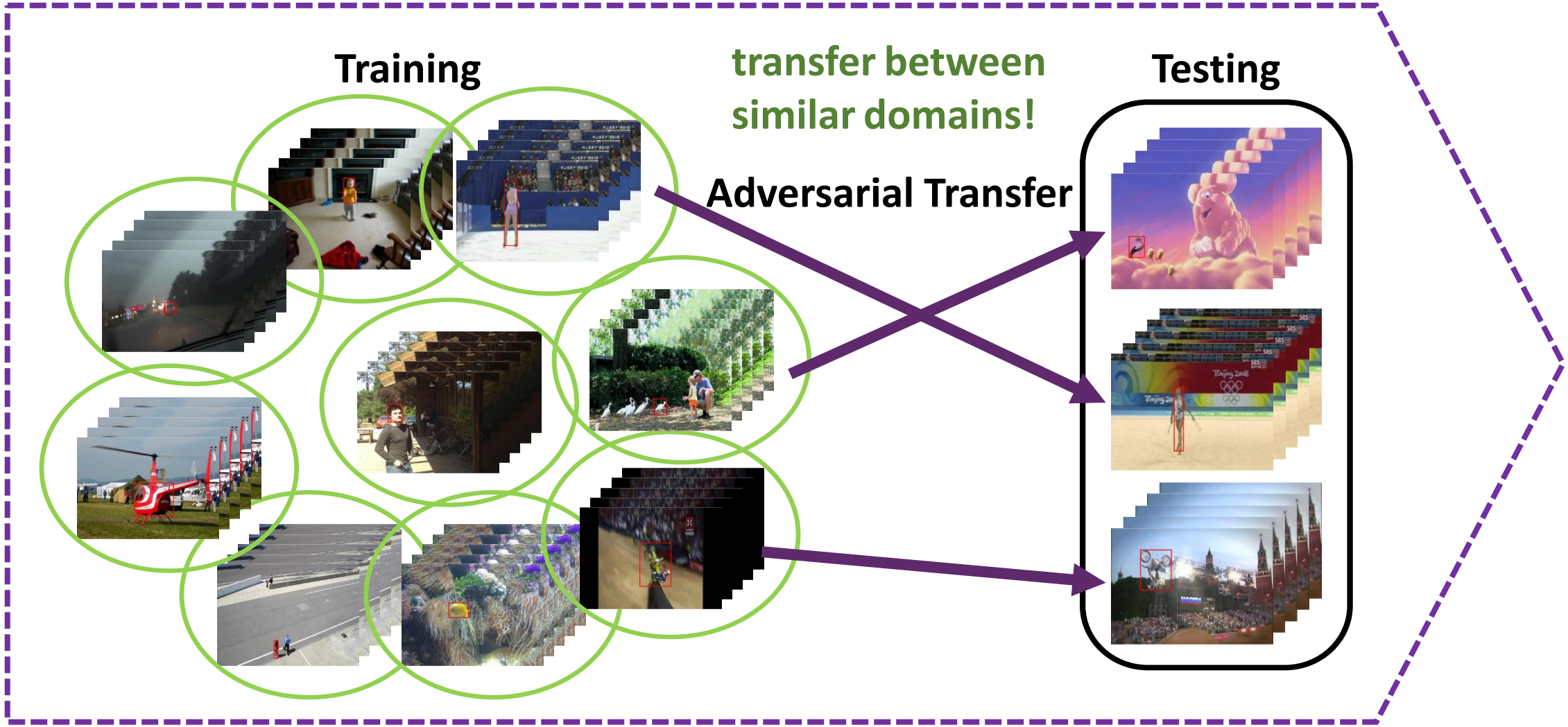
negative transfer!

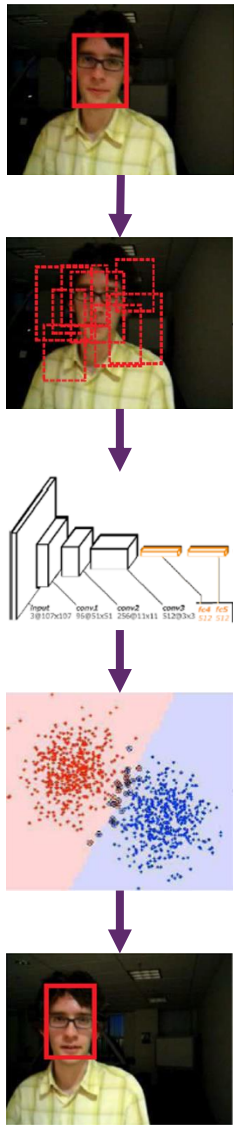
Testing





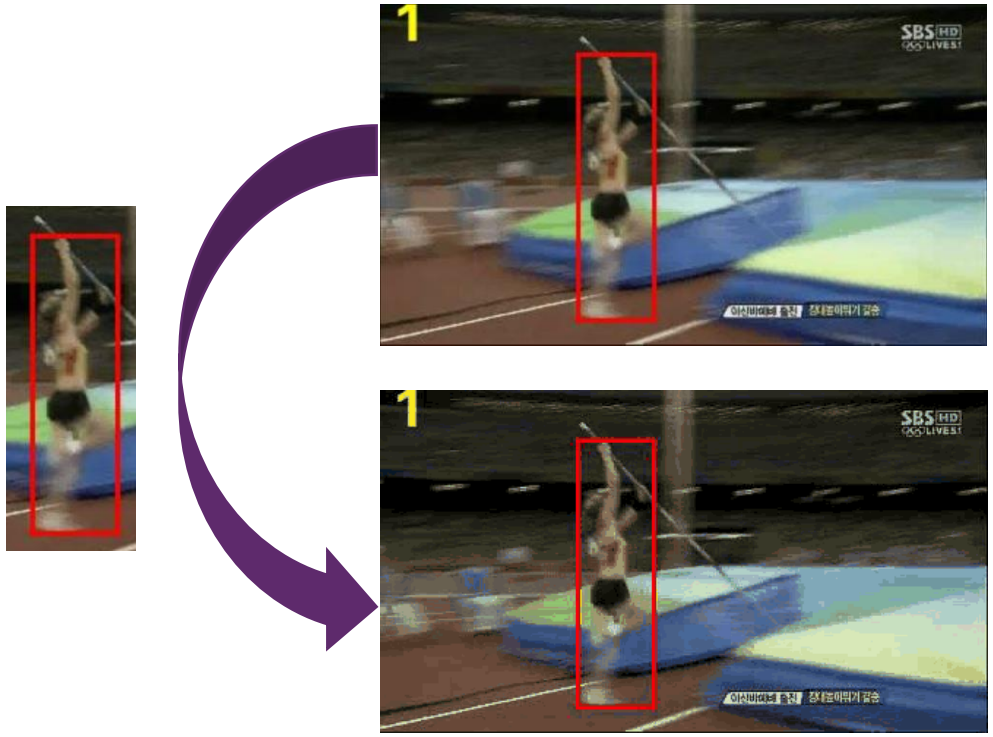
Our Adversarial Transfer Networks





An Example

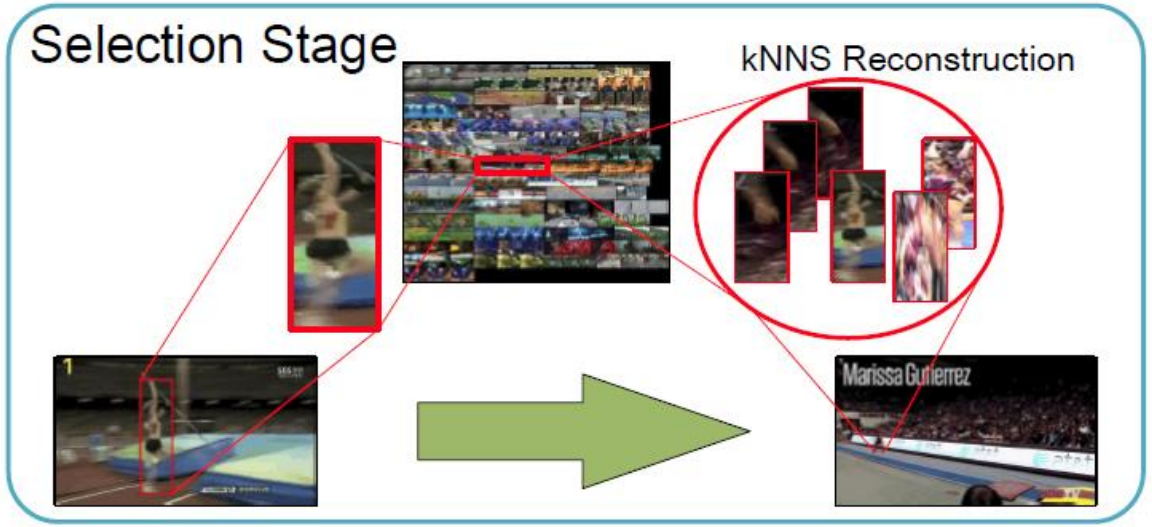
Testing video

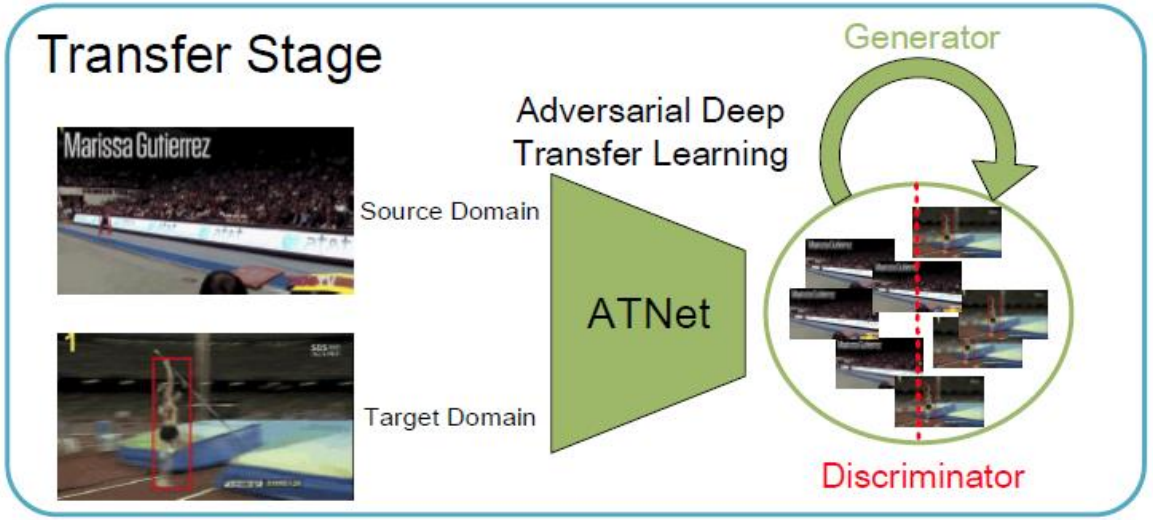


Similar video in the training set

Two Stage Framework

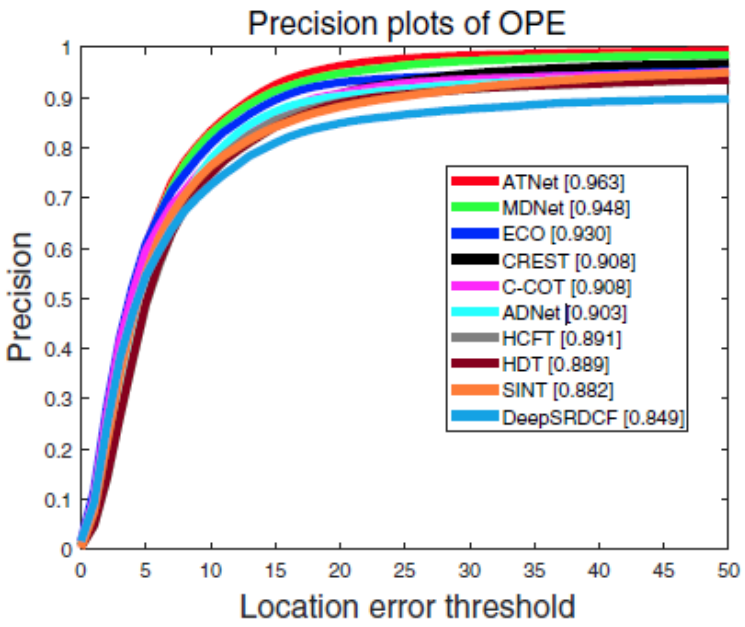
- Selection Stage
  - Find the most similar sequence.
- Transfer Stage
  - Make the features indistinguishable.



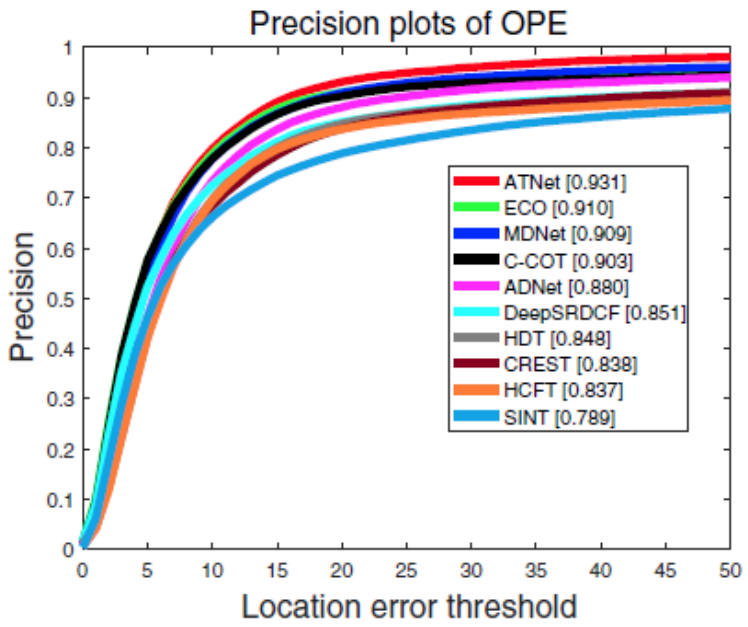


Experimental Results on OTB dataset

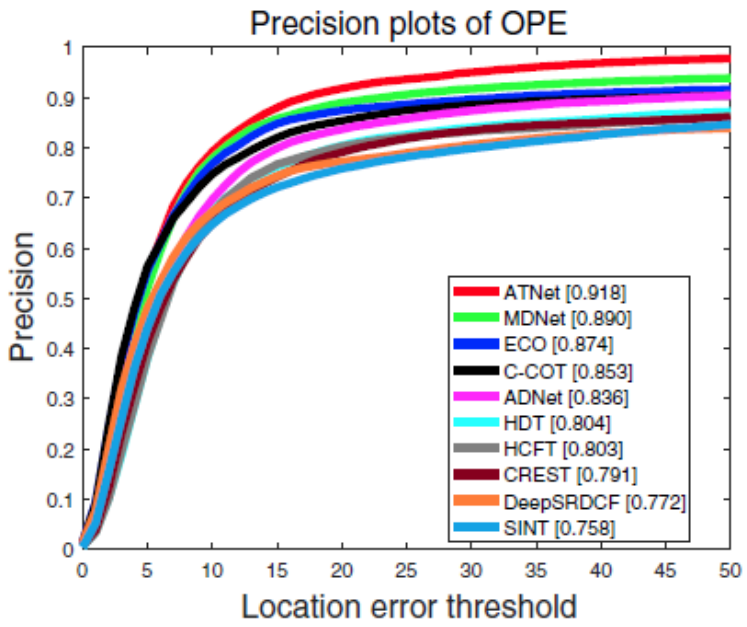
OTB-2013



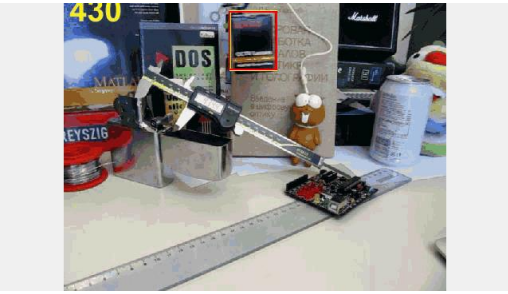
OTB-100

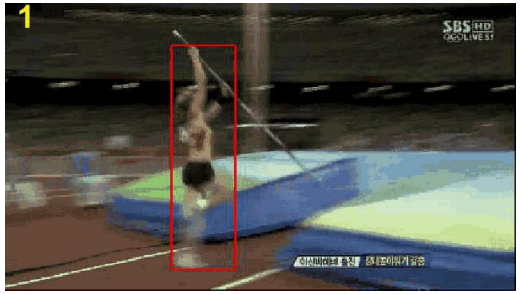


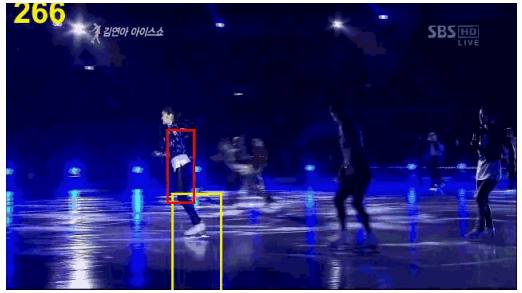
OTB-50



Our Method(adversarial transfer) MDNet(has negative transfer)

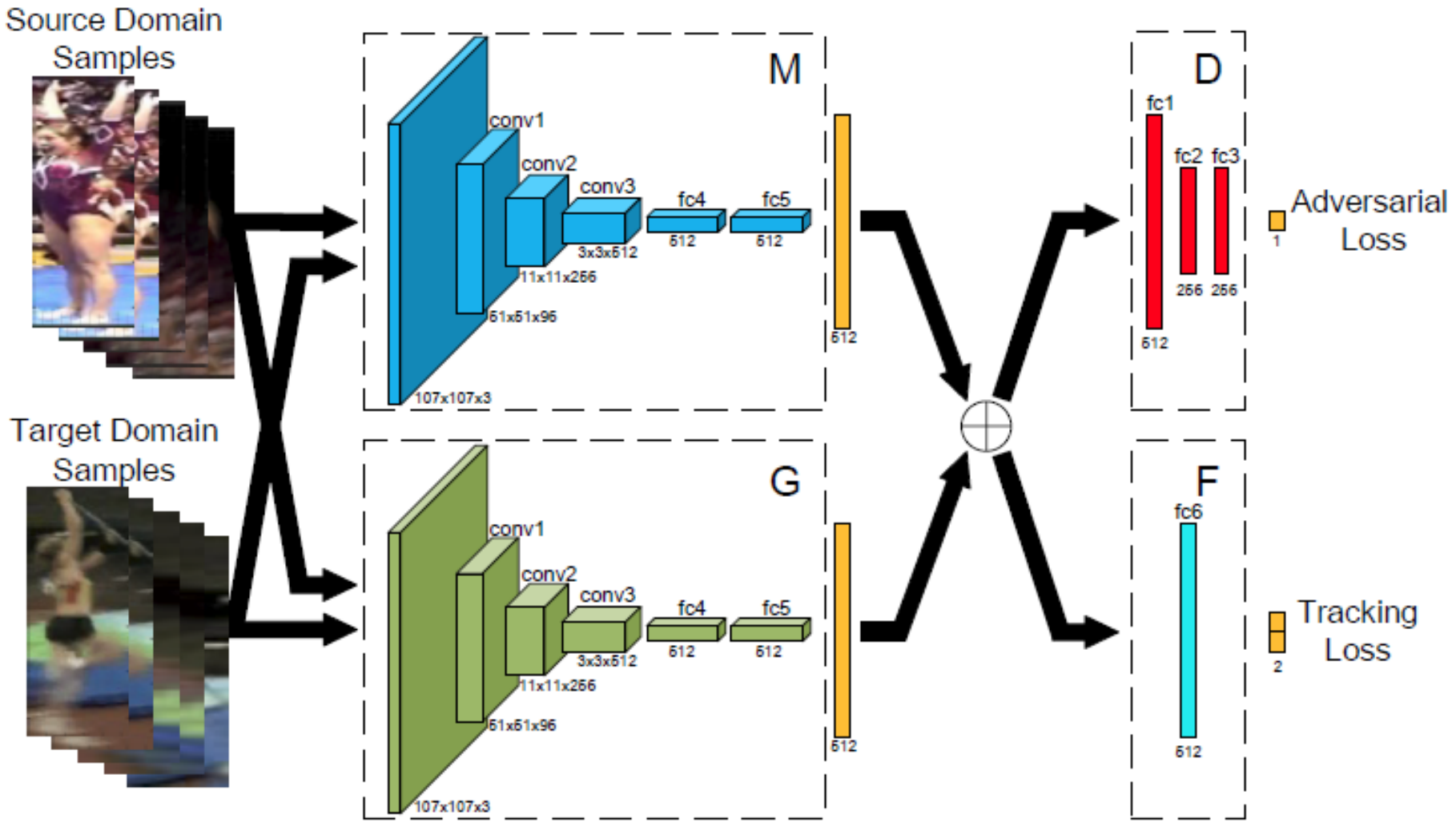




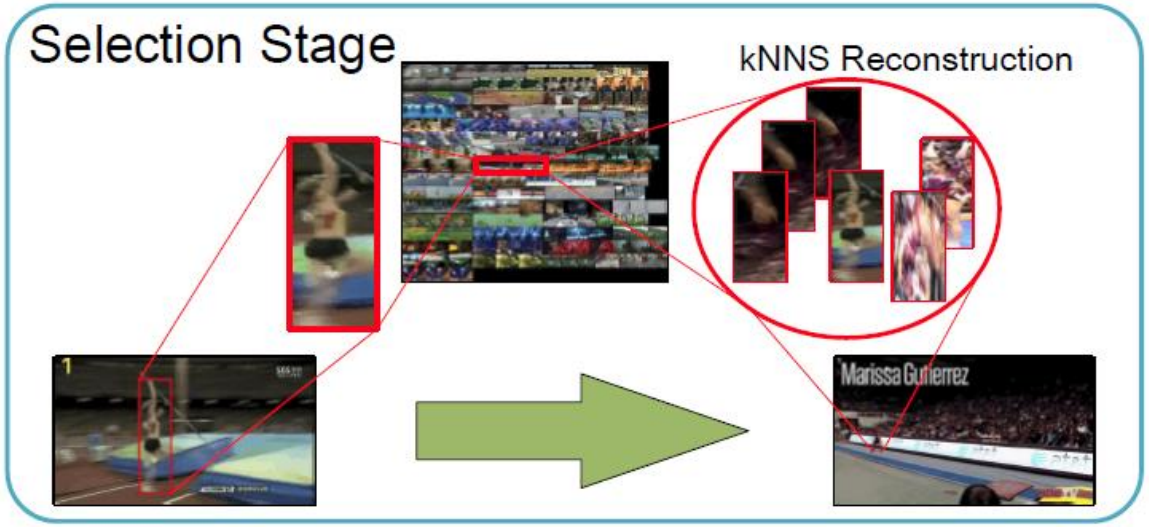


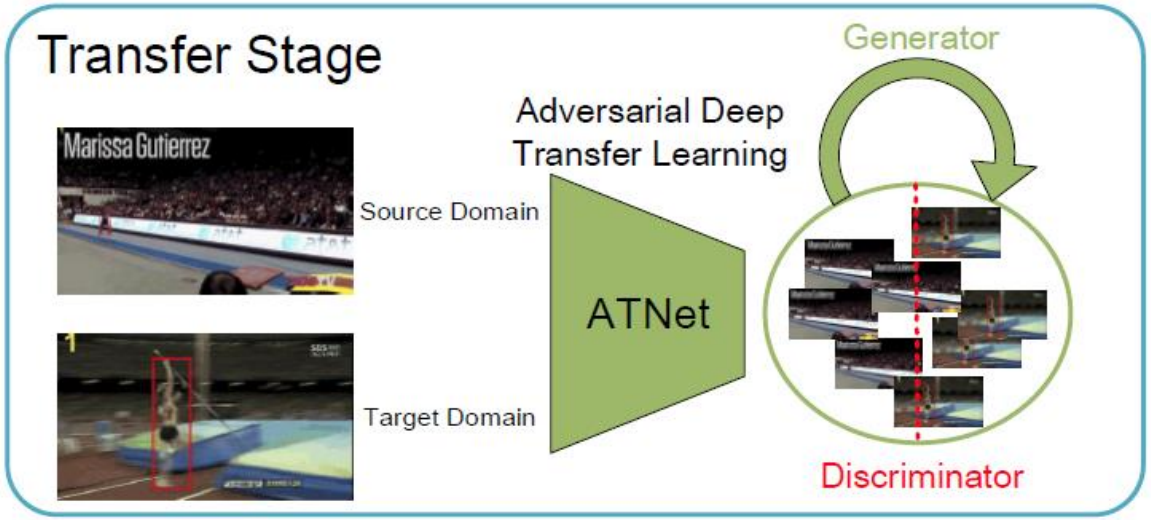
Thank you for listening!

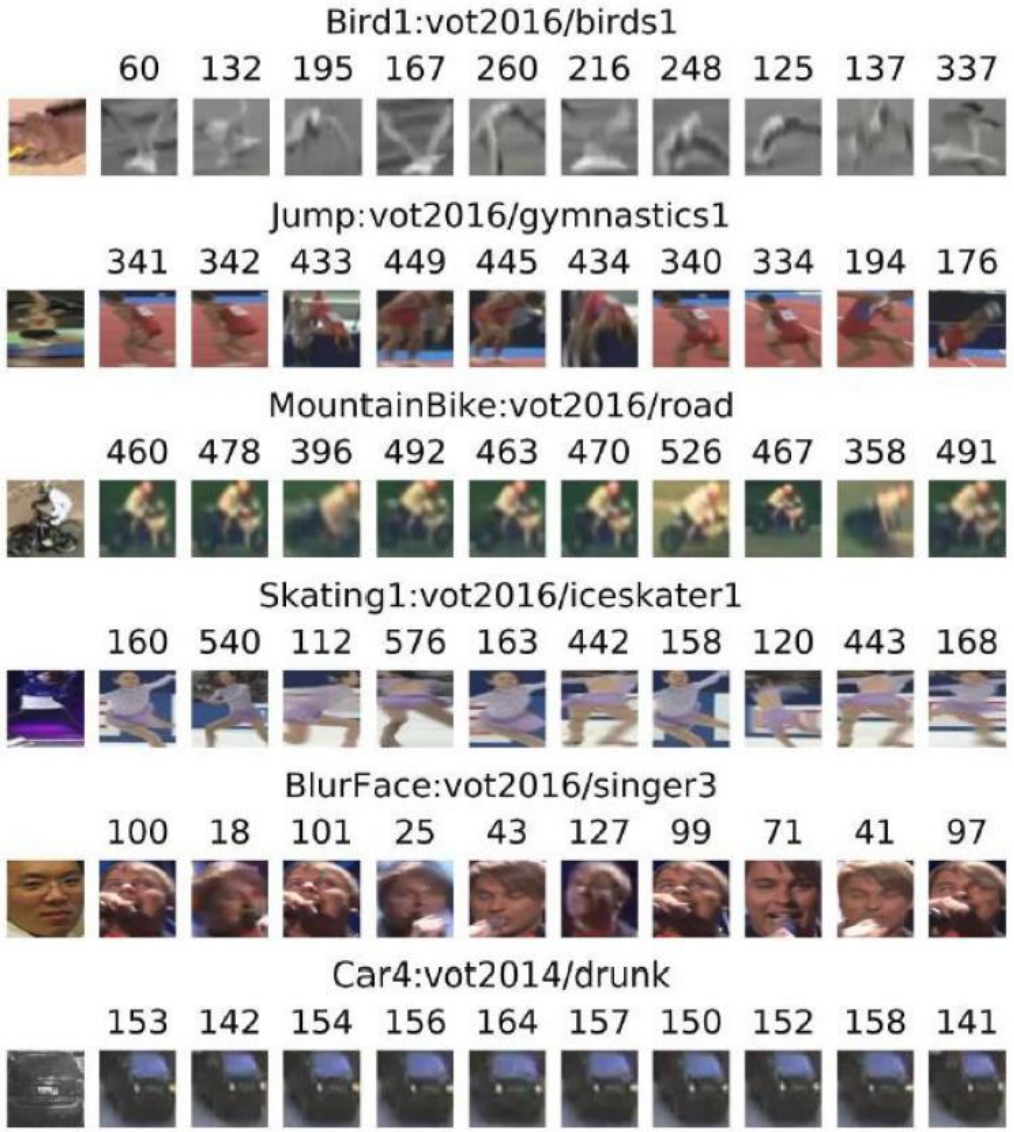
ATNet


Source Domain Samples
Target Domain Samples
M
G
conv1
conv2
conv3
fc4
fc5
3x3x512
11x11x256
51x51x96
107x107x3
512
D
fc1
fc2
fc3
256
256
512
1
Adversarial Loss
F
fc6
512
2
Tracking Loss

Visualization of Selection Stage







Visualization of Transfer Stage