

VTT: Long-term Visual Tracking with Transformers

Presentation, ICPR 2020

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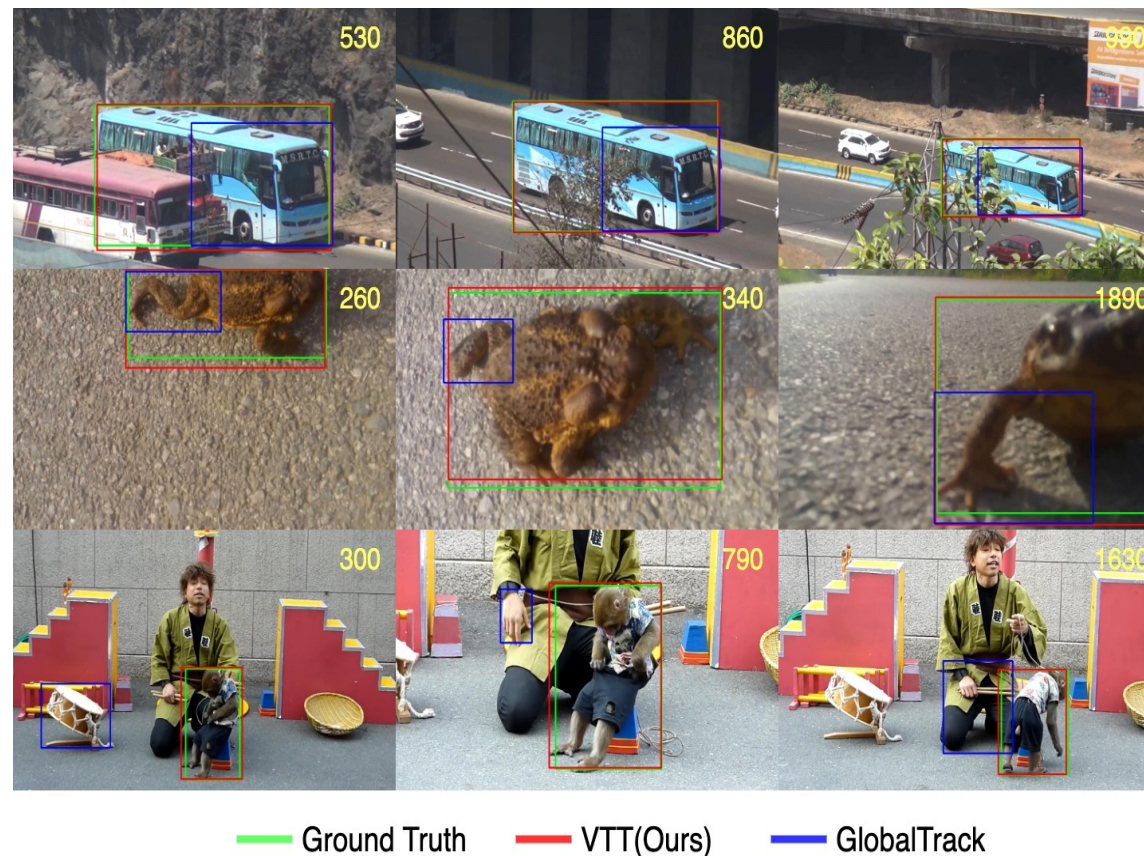
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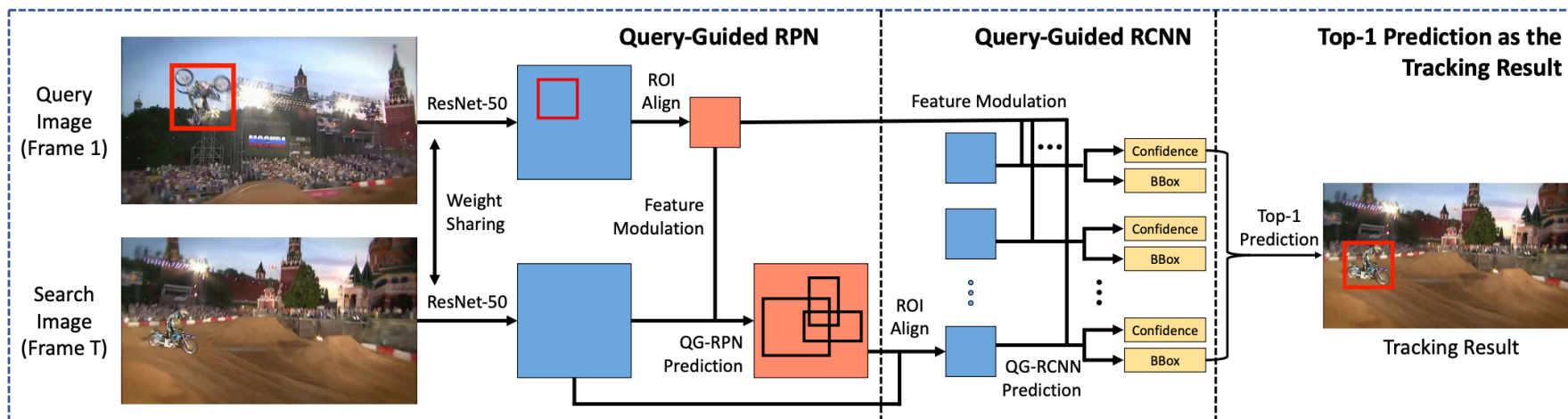
Goal

- Long-term visual tracking
- Difficulties
 - Occlusion
 - Scale and ratio variation
 - Distractors



Related Work

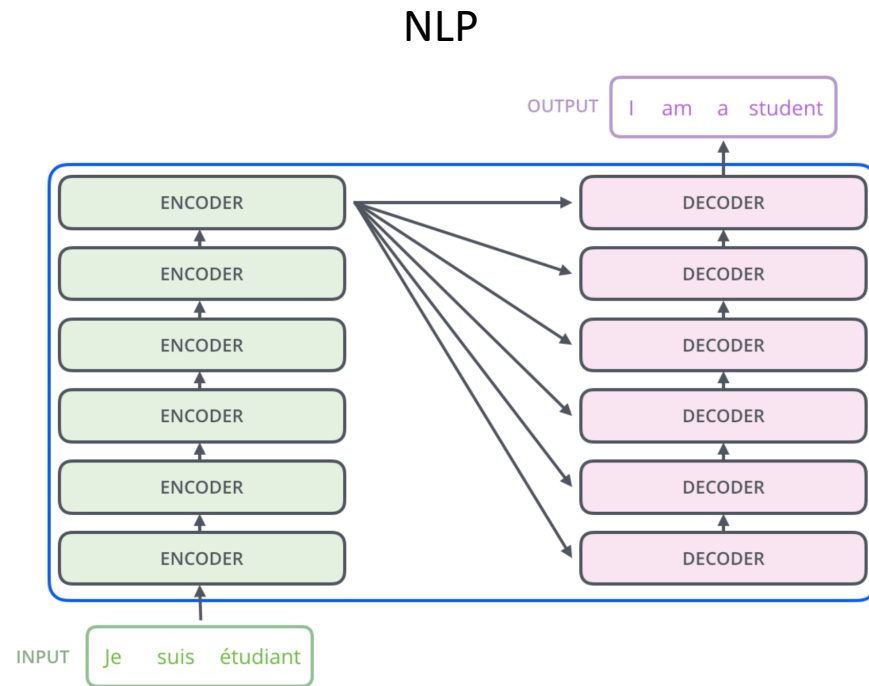
- GlobalTrack*
- Unable to handle Occlusion, scale and ratio variation
- Inferior performance against instance level distractors



* GlobalTrack: A Simple and Strong Baseline for Long-Term Tracking. Huang, Zhao, and Huang. AAAI 2020

Our Method

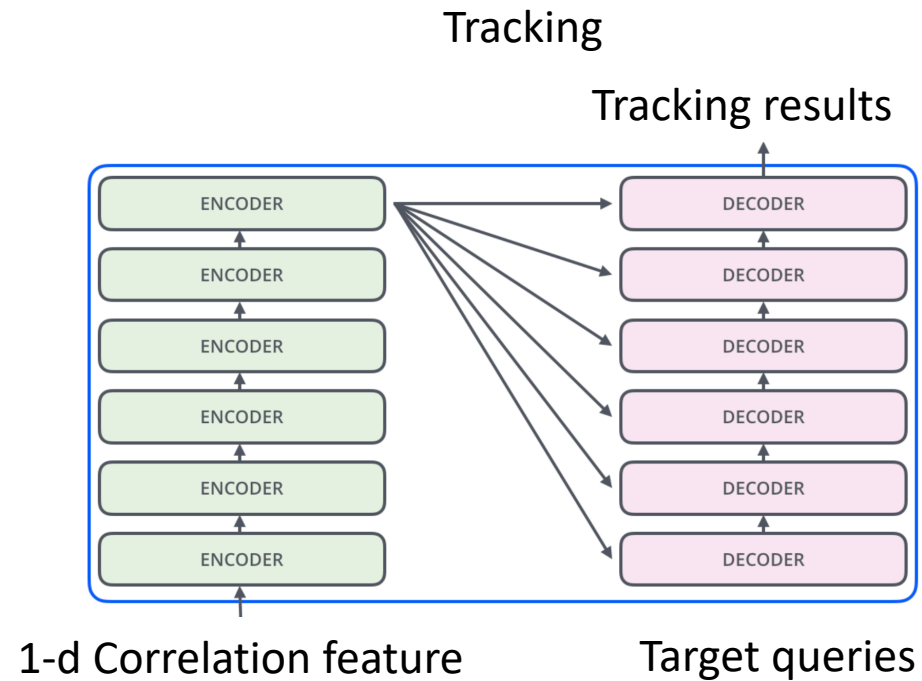
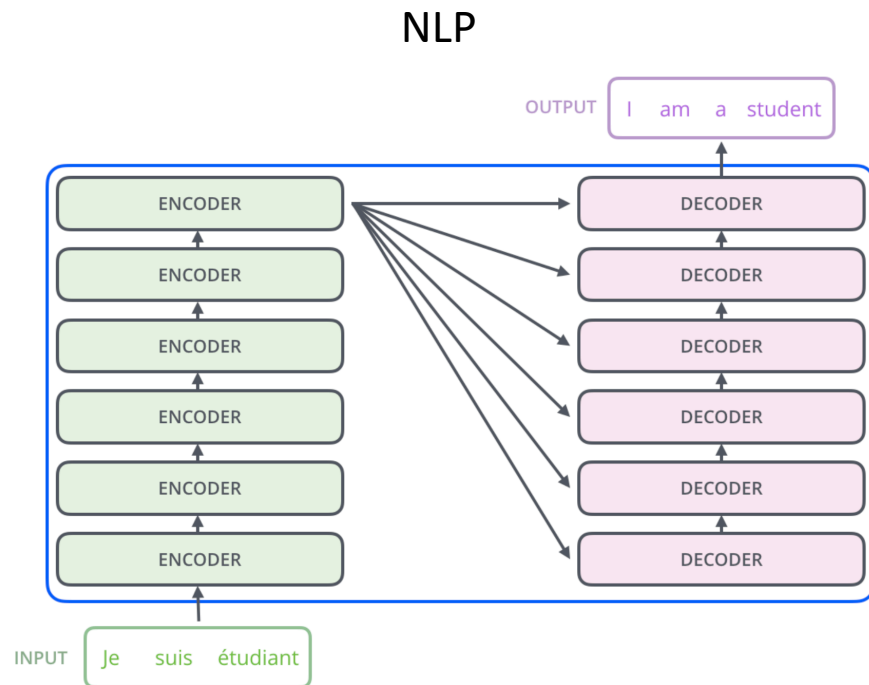
- Transformers* were first proposed for machine translation



* Attention is all you need. Ashish, et al. NeurIPS 2017

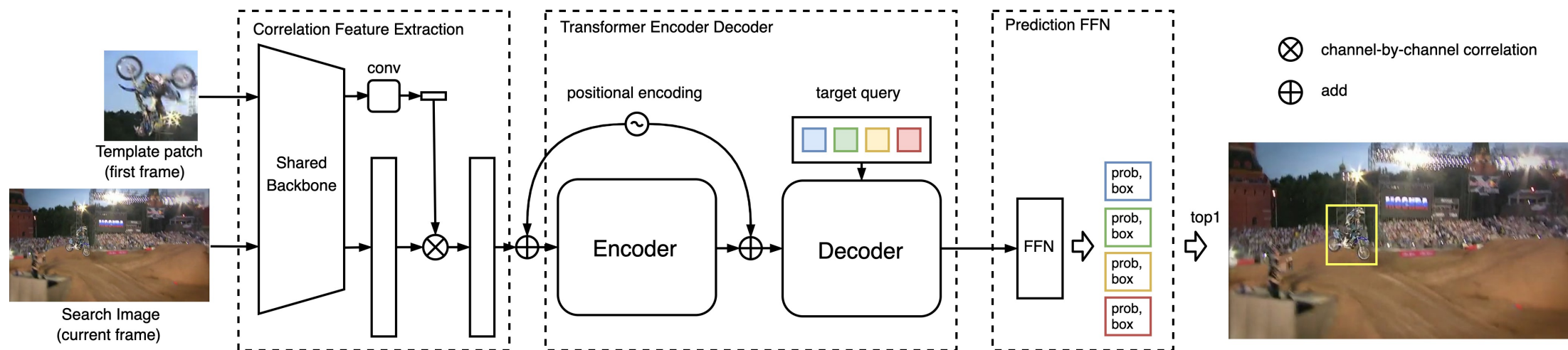
Our Method

- We adapt this architecture for tracking



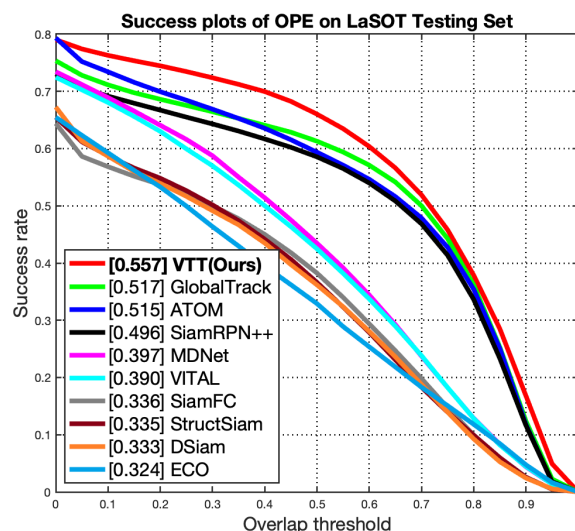
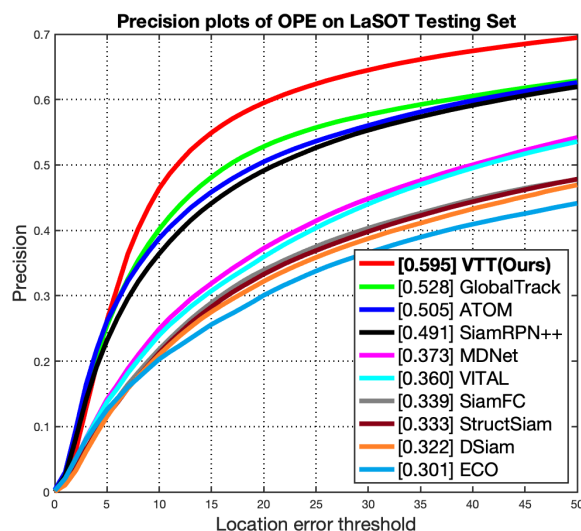
Our Method

- End to end trainable simple architecture



Experiment: Results

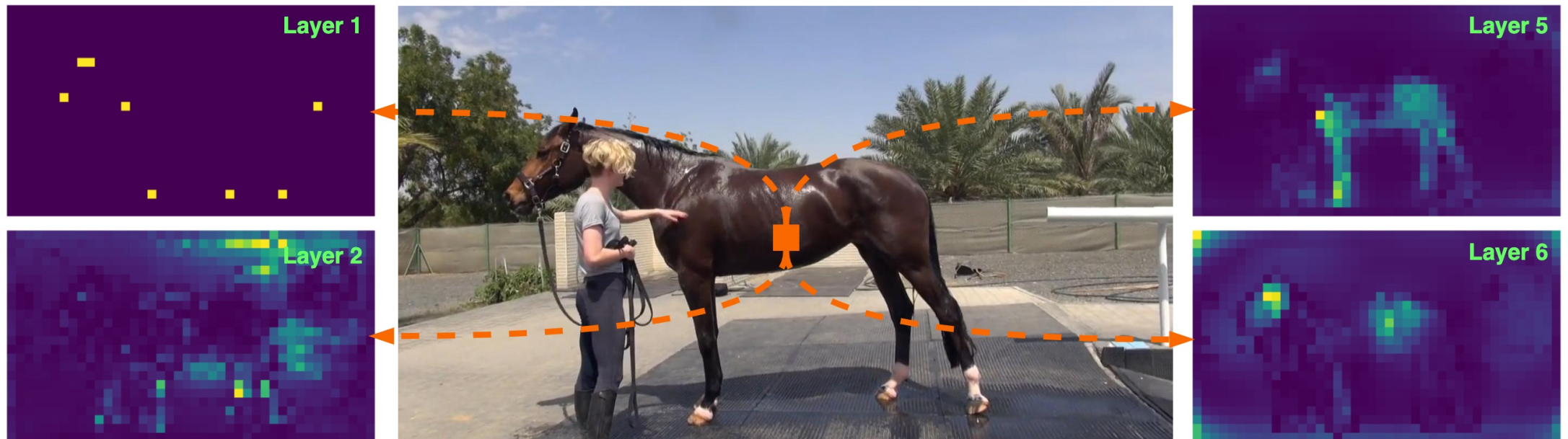
- Significant improvement compared to GlobalTrack on LaSOT* as well as other long-term tracking datasets.



* Lasot: A high-quality benchmark for large-scale single object tracking. Heng, et al. CVPR 2019

Experiment: Encoder Attention

- Lower level attention focus on visuals
- Higher level attention focus on semantics
- Attend to disconnected regions

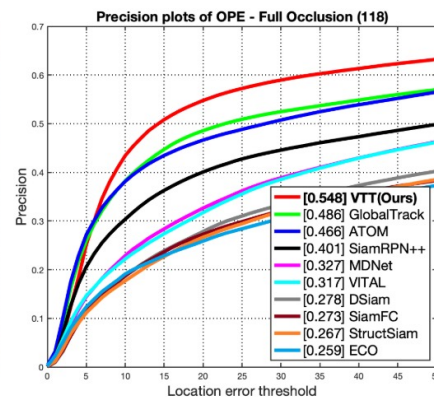


Experiment: Decoder Attention



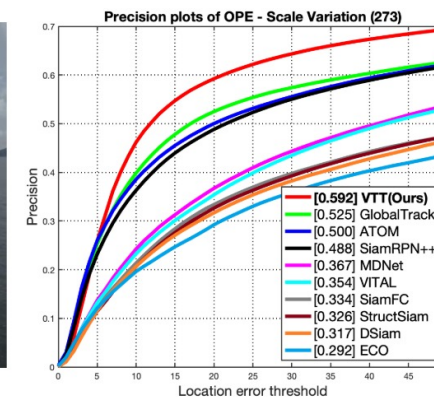
Ground Truth VTT(Ours) GlobalTrack

Occlusion



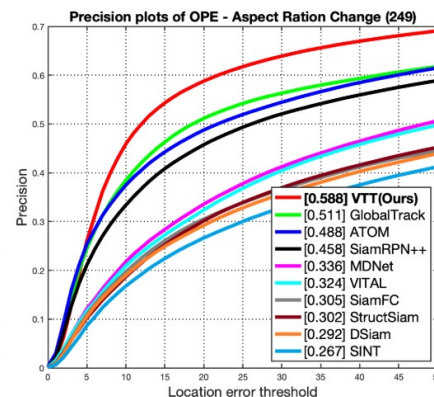
Ground Truth VTT(Ours) GlobalTrack

Large scale



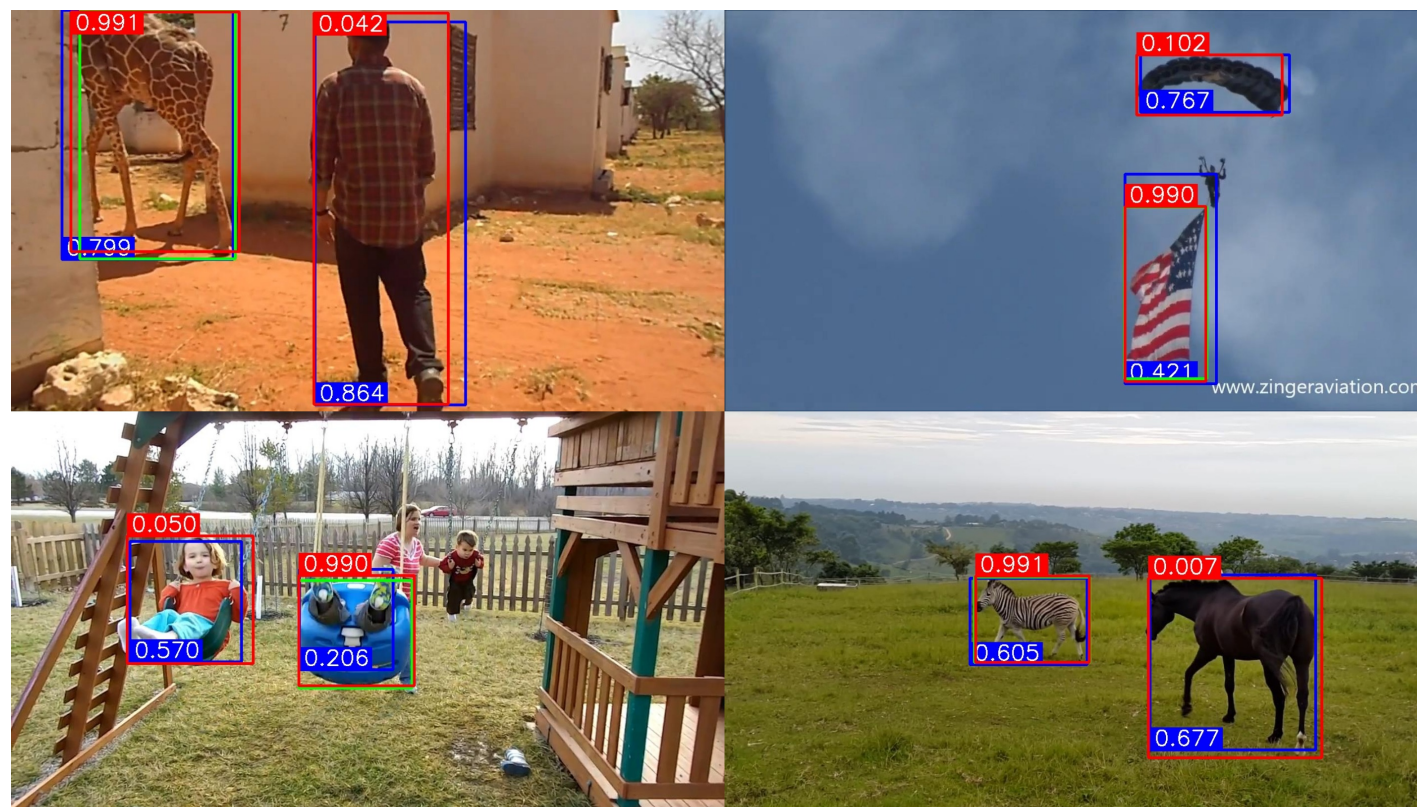
Ground Truth VTT(Ours) GlobalTrack

Extreme aspect ratio



Experiment: Distractors

- Compared to GlobalTrack, our method is significantly better



— Ground truth — VTT(Ours) — GlobalTrack

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