# VITAL: VIsual Tracking via Adversarial Learning

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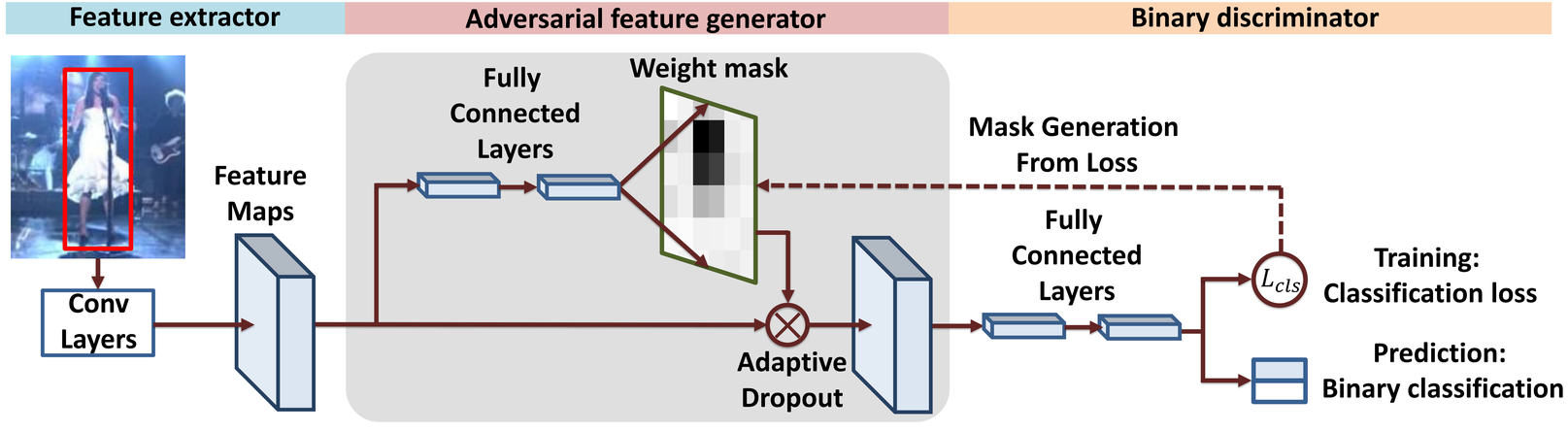
Source code: https://ybsong00.github.io/cvpr18_tracking/index

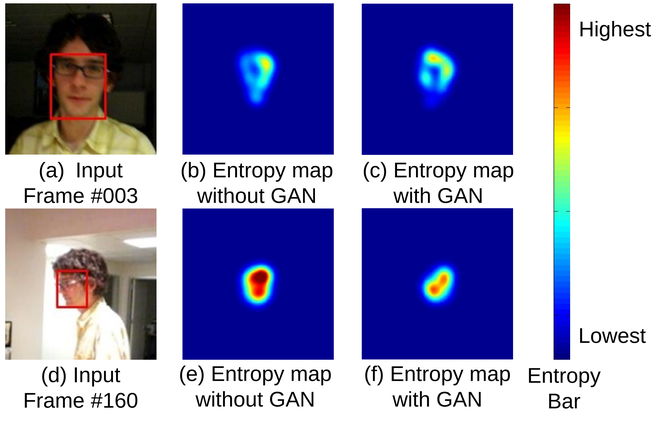
## Introduction:

- Two-stage tracking-by-detection framework:
  1. Drawing samples around target object.
  2. Classifying each sample as either target object or background.
- Limitations:
  1. Limited positive samples fail to capture rich appearance variations.
  2. Class imbalance between positive and negative samples.
- Our motivations:
  1. We diversify positive samples through adaptively dropout redundant CNN features. Adversarial learning helps our tracker exploit the most robust features over a long temporal span in the classifier training, rather than overfitting to discriminative features in single frames.
  2. We propose cost sensitive loss to decrease the effect of easy negative samples.

## Framework:




## Visualization:




## Tracking Pipeline:

- Model initialization:
  - Offline pretraining: we train D from scratch in a few iterations and incorporate G for adversarial learning. During each iteration, we first train D and then G.
  - Online finetuning: we online finetune the classifier using samples from the first frame.
- Online detection: we remove G and follow the two-stage tracking-by-detection framework for target localization.
- Model update: we online collect samples and update the model.

## Experiments:

Evaluations on the OTB 2013 dataset. More evaluations are presented in the paper.