

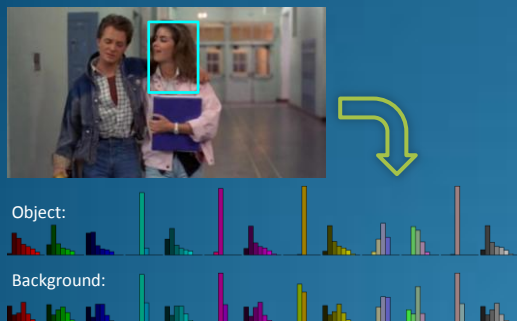
# Object Tracking in Video

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## Interactive Offline Tracking System for Generic Color Objects

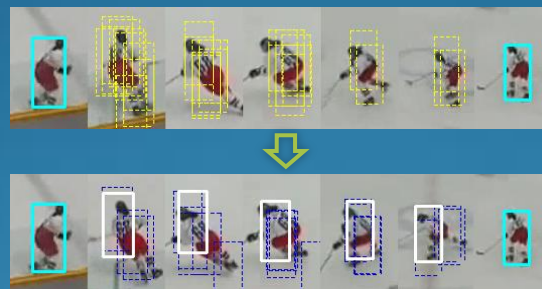
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### Object detector



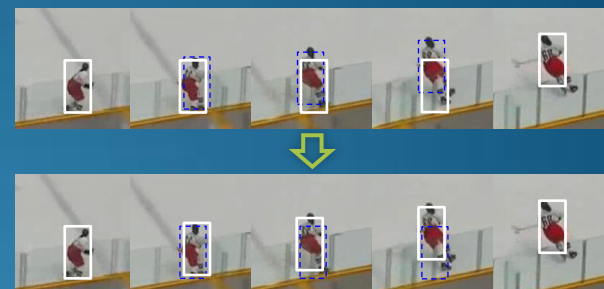
The detector uses color histogram bins [4] as features. These histograms are extracted by integral histogram data structure [2] and the object classifier is trained by AdaBoost algorithm [3].

### Trajectory creation



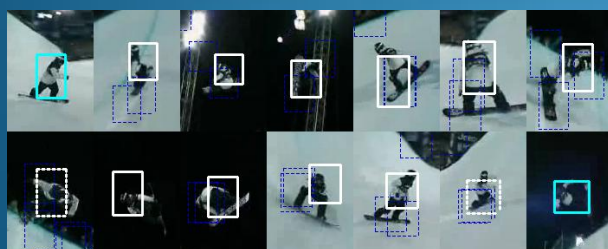
The detection is done on every tenth frame. The best samples are tracked forward and backward by mean shift algorithm [1] and the final trajectory is interactively created by combining these tracked samples.

### Interactive extension



User can prefer moving trajectory in front of stagnant one with using of the new interactive extension. The algorithm simplifies user's work and slightly improves the final trajectory results.

### Final results



Tracking of a snowboarder on a superpipe. The video contains complex scene with large background changes, the object permanently varies his pose and his clothes have similar colors like background clusters. The tracking was successful with using of five key frames.



Two key frame tracking of a boy whose position against camera is largely occluded.

- [1] Comaniciu, D., Ramesh, V., Meer, P.: *Real-time tracking of non-rigid objects using mean shift*. In CVPR, 2000
- [2] Porikli, F.: *Integral Histogram: A Fast Way to Extract Histograms in Cartesian Spaces*. In CVPR, vol. 1, pp. 829-836, Volume 1, 2005
- [3] Viola, P., Jones, M.: *Robust Real-time Face Detection*. In ICCV, vol. 2, pp. 747, Volume 2, 2001
- [4] Wei, Y., Sun, J., Tang, X., Shum, H.: *Interactive Offline Tracking for Color Objects*. In ICCV, pp.1-8, 2007

- Key frame sample
- Tracked sample
- Detected sample
- Final sample