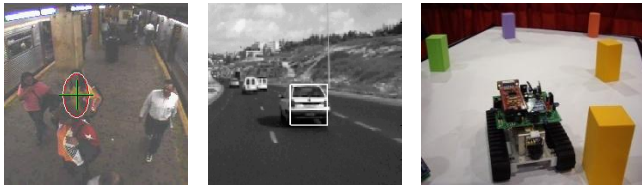


Research Contents

Background

■ **Object Tracking** is an important task within the field of Computer Vision. Applications include Surveillance Systems, Human Tracking Systems, Car Assistance Systems and so on.

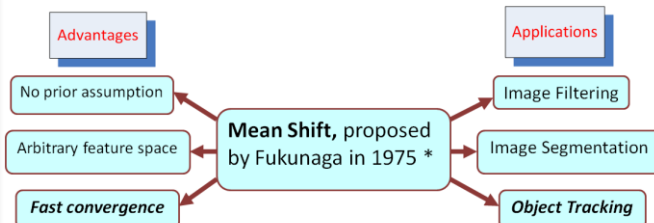


Surveillance

Car assistance

Robot vision

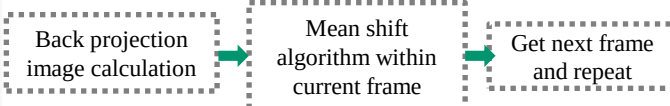
■ **Mean Shift** algorithm is one of the approaches to realize real-time object tracking.



* K. Fukunaga and L.D. Hostetler, "The estimation of the gradient of a density function, with applications in pattern recognition", *IEEE Trans. Information Theory*, vol. 21, pp. 32-40, 1975.

Approach 1: CAMShift method

Work flow



Drawbacks

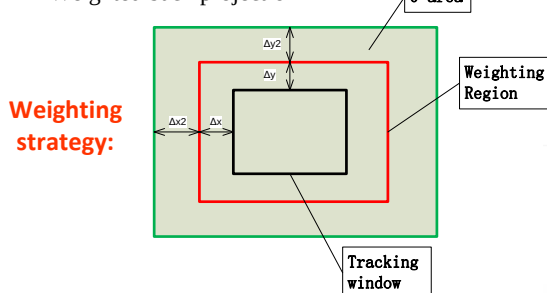
- Fail to track multi-colored object
- Not discriminative enough feature space
- Easy to be effected by nearby similar-colored objects

Proposals

- Thresholded histogram with 3-D RGB color space

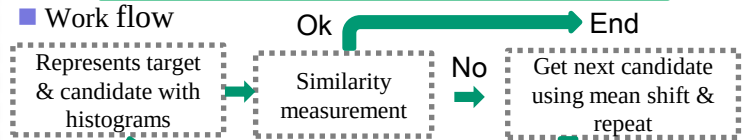


- Weighted back projection



Approach 2: target-candidate method

Work flow

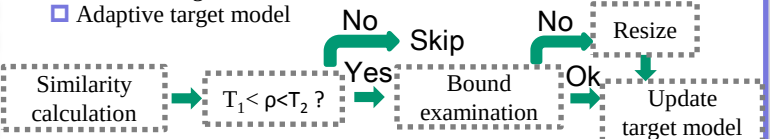


Drawbacks

- Unsuitable scale adaptation method
- Can not deal with appearance changing scenes

Proposals

- Combination of optimal & previous scale with non-proportional width & height
- Adaptive target model



Experimental Results

Traditional method

Proposal

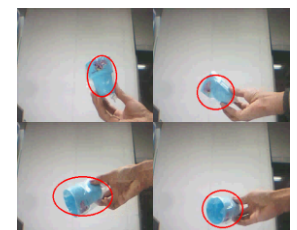
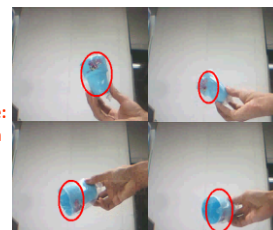
CAMShift:
multi-color



CAMShift:
similar-color



Target-candidate:
scale adaptation



Target-candidate:
appearance change

