16-720 Project Proposal: Selected Object Area Tracking

Syed Zahir Bokhari (AndrewID: sbokhari)

1 Abstract

In many situations object tracking systems give only a position or bounding box of the object being tracked. However there are many cases during tracking a foreground object requires us to know all the pixels associated with the forground objects. This is typically achived through a background subtraction system, which will reveal all foreground pixels. However in outdoor and publics spaces, the background is often dynamic, and contains much motion which we would not consider foreground.

Allowing the user to specify a desired object (or objects) of interest by means of a fuzzy selection will make it possible to discover the boundary of the object, by menas of [1] or [2]. Only one method should be needed, however there is a tradeoff between accuracy and time.

Once the object is selected, [3] details a robust way to estimate the background of outdoor scenes without foreknowledge of the background, and is adaptive to long term changes in the scene. This should help in discovering the changing boundery of the object as the video plays, and move the contour as necessary.

2 Technologies

MATLAB for prototyping and proof of concept. Python and OpenCV for final implementation if time permits.

References

[1] J. Canny. "A Computational Approach to Edge Detection," *Pattern Analysis and Machine Intelligence, IEEE Transactions* on (Volume:PAMI-8, Issue: 6)

[2] M. Kass, A. Witkin, D. Terzopoulos. "Snakes: Active Contour Model," *International Journal of Computer Vision*

[3] C. Stauffer, W. Grimson. "Adaptive background mixture models for real-time tracking," *Computer Vision and Pattern Recognition, 1999. IEEE Computer Society Conference* on. (Volume:2)