



UMass Lowell Computer Science Colloquium Announcement

Speaker: Dr. Ahmed M. Elgammal
Dept of Computer Science, University of Maryland College Park

Date: Feb. 19, 2002

Time: 3:00pm - 4:00pm

Place: Olsen Hall 311
Refreshments are served at 2:30pm

Real-time Algorithms for Visual Surveillance

Automatic understanding of events happening at a site is the ultimate goal for many visual surveillance systems. Higher level understanding of events requires that certain lower level computer vision tasks be performed. These may include detection of unusual motion, tracking targets, labeling body parts, understanding the interactions between people, etc. To achieve many of these tasks it is necessary to build representations of the appearance of objects in the scene. This talk focuses on constructing statistical representations of the scene background as well as foreground (moving objects).

First, we present a novel non-parametric adaptive background model and a background subtraction approach that supports sensitive detection of moving objects in the scene, but is robust to clutter arising out of natural scene variations. Second, we present statistical representations of the foreground regions (moving objects) that support their tracking and support occlusion reasoning. We present an algorithm for segmenting foreground regions corresponding to a group of people in occlusion, given models of their appearance that were initialized before occlusion.

The probability density functions associated with the background and the foreground are likely to vary from image to image, and will not in general have a known parametric form. We accordingly utilize general nonparametric kernel density estimation techniques for building these statistical representations. These techniques estimate the probability density function directly from the data without any assumptions about the underlying distributions. We present an efficient computation framework for these density estimation techniques that utilizes their use in real time vision applications.

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