**BLM6136 Computer Vision**

**Project : Mean Shift Object Tracking**

**Due to: 13 of June, 2017 Tuesday**

**Mean Shift Algorithm:**

Mean Shift is a nonparametric technique that constitutes a robust approach to the analysis of complex multi-modal feature spaces. The basic idea behind mean shift algorithm is to climb the gradient of

a probability distribution to find the nearest dominant mode. It represents a robust method of finding local extrema in the density distribution of a data set and, besides being used to segment image regions it has been successfully applied to the problem of object tracking in computer vision

**Mean Shift Object Tracking:**

In the work Comaniciu et al. [2003] a mean shift based tracking algorithm is provided. The following is performed for every frame in the sequence.

given: the target model and its location in the previous frame

1. compute the weights

2. compute the mean shift vector and update the target candidate

3. check convergence criteria (stop or go to step 1)

Students are asked to implement in Matlab the tracking procedure that has been briefy introduced in the previous subsection according to the original paper Comaniciu et al. [2003].

The resultant software will be tested on the test.avi and ball.avi. As usual, homework will be submitted by CD and hardcopy report with a demo session at 13 of June 2017 Tuesday

Hint 1 Matlab VideoReader function can be used to input video sequences.

Hint 2 There are a number of implementations available on the internet; please take these just as an inspiration source; never copy and always cite your sources.

Hint 3 You can conveniently use colour and histograms for object distributions.

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