

EE475

DIGITAL IMAGE PROCESSING

TERM PROJECT
PROPOSAL

TRACKING HUMAN FACES USING MOTION

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Objective

Target detection and tracking is one of the most important and fundamental technologies to develop the real world computer vision systems such as security and traffic monitoring systems. Objects in real world are recognized and localized in the image. This perception is used to trigger a physical event such as directing the robot that carries the camera towards the object. In this project, our aim focuses on tracking of moving objects in natural environments. We believe that target tracking is not only localizing objects on moving conveyors, but tracking self-moving objects by a cooperative distributed vision system where more than one vision capture system works simultaneously and cooperatively. Minimum vision sensor, wide area coverage, multiple target tracking and valuable data extraction can be achieved by distributed vision systems through dynamic interactions among perception, action and communication.

In the project, we will employ background subtraction and various biologically oriented cartesian and non-cartesian filters to detect human or faces. Images will be shot through a stationary camera and algorithms will be expected to localize the moving objects (human face) in the camera view area.

Objects, in streaming video. This video can be a pre-recorded image sequence or frames coming through the camera at real time. Matrox Image Acquisition cards and Sony CCD cameras will be employed to obtain high resolution, quality images. Microsoft Video for Windows will be used to capture images from D-Link and MediaForte webcams over USB port.

Things to do

- ? Selection of hardware: Comparison of the selected cameras.
- ? Preparation of software: Microsoft Visual C++ and Microsoft Vision SDK will be used to capture images. Using these tools we will write a windows program for image acquisition from cameras and passing it to the processing module.
- ? Test and verification of various algorithms such as object segmentation algorithm and biologically inspired cartesian and non-cartesian filters.
- ? Apply background subtraction algorithm
- ? The processed image will be compared with the original for consistency. The proposed image should contain the main outer-most edges of the original image. The corresponding vehicles must be in the neighbourhood of the original.
- ? Writing an algorithm to detect moving objects in a single frame.
- ? Speed up the algorithm to handle image streams such as real time capture or recorded video file.

References

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