CS 280 – Computer Vision – Fall 2013

Final Project Proposal

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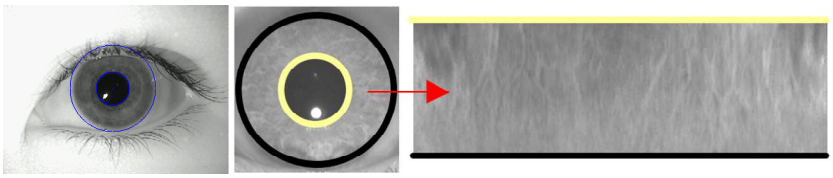
For the final project, we will be exploring and implementing various computer vision techniques to obtain reasonable accuracy for iris verification and identification. General outline of proposed approach (by process):

Iris localization – locate the inner and outer boundaries of the iris with edge detection algorithms (i.e. first order gradient components), explore mathematical operators to isolate the iris and pupil respectively (recover circular geometry via homography), achieve reasonable accuracy w.r.t. noise and computation time.

Iris segmentation – transform iris texture from Cartesian to polar reference (rectangular representation) to retrieve detailed frequency information to facilitate feature extraction. Explore other methods of delineating the analysis of circular iris geometry (i.e. octant segmentation).



Feature extraction and matching – for the purpose of testing after training over known dataset, obtain/compare feature vector(s) from one or more of the following methods:

- Textons (edge orientation, pixel intensity, histograms, etc.)
- Decision trees (local feature arrangements, shape)
- Hamming distance (Fourier transform, binary filters, etc.)
- Etc…

Depending on the techniques used, and the performance, we will use various machine learning algorithms to organize data.

Possible dataset (subject to change): http://pesona.mmu.edu.my/~ccteo/