18-799K Cognitive Video
Instructor: Yang Cai

Assignment 4 Gaze Analysis

Due March 27, Thursday, 11:59 pm

Tracking eye movement is a power tool for understanding user's attention, preference and intent. It is also a decision-making model for optimizing video streaming, compression and object recognition. In this assignment folder, we have four test images and four associated eye-tracking datasets in form of spreadsheets. Each data point is a row, with the parameters separated by commas. This kind of file can be loaded automatically by MATLAB using the csvread command. (http://www.mathworks.com/help/matlab/ref/csvread.html)

The critical parameters are: time, left found, left calibrated, left gaze X Point and left gaze Y point.

Discard the row unless left found and left calibrated are BOTH true.

The unit of the time is in milliseconds. The unit of the gaze point position is in pixels starting from the top left. The pictures are 1680 x 1050.

A. (25%) Download the images and eye gaze datasets. Plot the saccadic gaze points on each image and link them with lines.
B. (25%) Based on above, plot the heat map based on gazing durations (the longer gaze, the 'hot' the color).
C. (25%) Animate the four saccadic eye movement sequences and save each animated sequence in a video file (e.g. MPEG-4, AVI, or Animated GIF)
D. (25%) Based on above, animate the Left Pupil Diameter (D) and save each sequence to corresponding video file. Discuss the findings.
E. (Bonus 25%) Convert gaze position sequences to Dynamic Time Warping sequences (see Chapter 6). Calculate the DTW distances between the four sequences and summarize them in a Confusion Matrix.

The report includes a zip file of method descriptions, key parameter input values, source code, screen shots, and output videos. Submit to BB under Assignment 4.