

ESE 356 Digital System Specification and Modeling
Project 3: Gaze Behavior Monitoring System
Phase 1 (Initial Version) Requirement

Due on 11/21/2019

Total Points (25): No late submission (submit the file by midnight of the due date)

1. Initial Phase Specification

Sensor Characteristics:

Sensor processing should be clocked based. Every clock, one (x, y) pair is generated. The range of x and y is between 0 and 1024. The data type should be integers. Should select the clock such that 100 samples are generated in each seconds (i.e., 1 sample every 0.01sec).

Sensor Processing:

In this phase, assume all required information are received. The information should be coded within mobile modules or read from the file in the beginning of the simulation.

5 images information will be used in the simulation. However, in this phase, you can use the first image only. Assume image size is 1024 by 1024. So x and y can go from 0 to 1023.

Assuming the image coordinate (0,0) is left bottom corner. Use following ROI information

Image 1: ROI 1: (50, 20), (400, 320), ROI 2: (50, 370), (450, 1000), ROI 3: (470, 20), (600, 900), ROI 4: (670, 40), (950, 550), ROI 5: (680, 700), (1000, 1000)

Image 2: ROI 1: (10, 10), (150, 700), ROI 2: (300, 10), (980, 250), ROI 3: (300, 270), (980, 700), ROI 4: (10, 740), (950, 1000)

Image 3: ROI 1: (10, 10), (260, 900), ROI 2: (270, 10), (520, 1000), ROI 3: (570, 20), (700, 950), ROI 4: (730, 10), (950, 950)

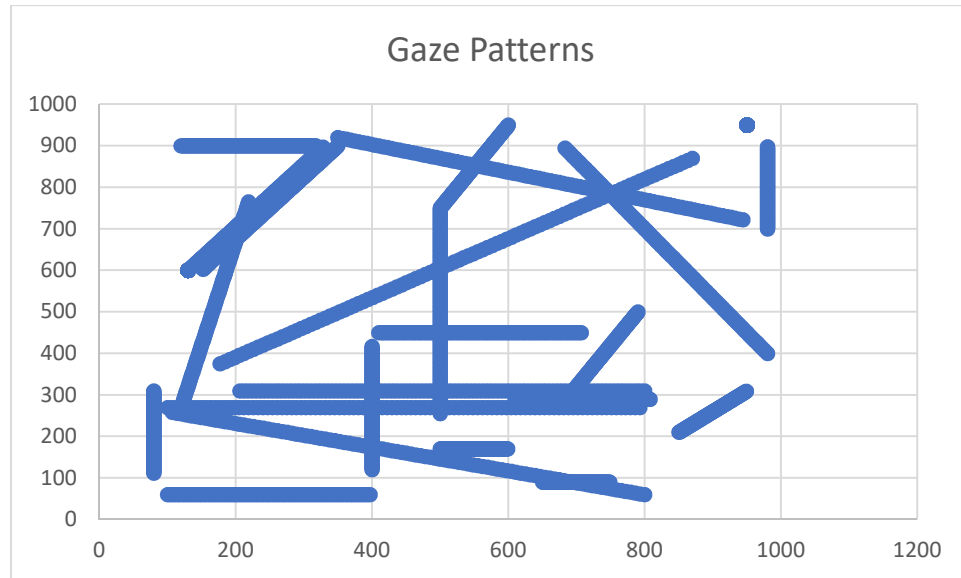
Image 4: ROI 1: (10, 10), (160, 1000), ROI 2: (170, 10), (220, 1000), ROI 3: (230, 10), (380, 1000), ROI 4: (390, 10), (540, 1000), ROI 5: (550, 10), (700, 1000), ROI 6: (710, 10), (860, 1000), ROI 7: (870, 10), (1010, 1000)

Image 5: ROI 1: (10, 10), (1000, 160), ROI 2: (10, 170), (1000, 220), ROI 3: (10, 230), (1000, 380), ROI 4: (100, 390), (1000, 540), ROI 5: (10, 550), (1000, 700), ROI 6: (10, 710), (1000, 860), ROI 7: (10, 870), (1000, 1010)

Transmit Packet Size (20 tuples)

Counters: image_counter, transmit_packet_counter, tuple_counter, image_packet_counter

Figure shows the gaze patterns. The gaze file (gaze.dat) can be used with the main program. One (x, y) data can be read in each clock period to emulate the gaze behavior.



Gamma = the minimum waiting time variation (0, Gamma) at the mobile trying the access the network.

Packet size: packet size from the mobile to server is fixed.

2. Verification and Simulation

Write a test bench to verify your codes. The simulation result can be textual. You should generate the output with the time and communication handshake activity. In addition, you should log the counter value variations in order to plot the counter values as a function of time. You can use either MATLAB or MS Excel to plot the data.

3. Submission Requirements

- Modules descriptions
- Source codes for robot, processing, server, top main and necessary test-bench codes
- Data base structures for robot, processing, server
- Description (pseudo codes) for handshaking mechanisms
- Verification/Simulation results: Handshake event activities (with time and event)
- Summary report (1-2 pages)

Submission through electronic files (zip version)

The report grading will be based on 1. Clarity of the report, 2. Completeness of the results.