Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science
6.111 – Introductory Digital Systems Laboratory

Final Project Check-off Sheet

Project Title: Bacteria Colonalyzer
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Design

- □ Overall system block diagram
- □ Code for Verilog HDL modules
- □ State and block diagrams for Blob detection and Image Processing
- □ Block diagrams for Screen Display
- □ State and block diagrams for Region Selection and Zooming *(if there is time*)

Functionality

- □ Image capture should demonstrate:
  - □ loading test blobs image from memory on Screen
  - □ capturing image from camera or scanner onto screen *(if there is time)*.
- □ Blob detection should demonstrate:
  - □ setting of threshold on image areas to be analyzed allowing user to adjust threshold
  - □ generation of binary black/white blob image for analyzing
  - □ generation of trinary white/red/blue/ image for analyzing (if there is time).
- □ Image processing module(s) should demonstrate:
  - □ detection and identification of isolated blobs of circular/rectangular shape for binary image
  - □ detection and identification of isolated, different shaped blobs (L-shaped, U-shaped) of different orientations on binary image.
  - □ detection and identification of overlapping (non-intersecting) blob shapes.
  - □ perform the above detection and identification on trinary image (if there is time).
- □ Video Display and Overlay demonstrate:
  - □ correct display of test blobs image.
  - □ correct display of captured image(if there is time)
  - □ correct display of overlay on top of original/ raw image
  - □ display of count of blob types (if there's time display count of different colored blobs)
  - □ display/feedback on progress (if there is time) of processing by
    - □ status bar
    - □ incrementally changing overlay
    - □ audio alert (beep) when processing is done
- □ User interface should demonstrate:
  - □ proper functionality for all user inputs including reset, capture, process, image threshold values
  - □ proper functionality of keyboard inputs in lieu of FPGA buttons
  - □ user mouse input to select region of image for zooming and analysis

Discussion

- □ What are the limitations of the system?
- □ What are some of the blob detection Algorithms you considered?
- □ What would you add to the system if you had more time. Why would you add? How would you add?