Wolfe Styke – 6.111 Final Project Check-off Checklist

Video Frame Storage and Retrieval Modules

Stores frames of video in ZBT memory in a buffer, passes frames from memory out to Filter modules. The frames coming out of this system can be connected to an external monitor to check that the original signal is being preserved.

Filter Modules

Frames are passed in and analyzed for pixels which depict the wand. The coordinates of these pixels are passed on to the center of mass modules. These hcount and vcount values for pixels depicting the wand can also be passed out to an external monitor, similarly to the last test, to show the accurate detection of the wands.

Center of Mass Modules

Taking in the coordinates of pixels showing where the wand is, this module computes the center of the wand, if the wand is present. It passes the location of the wand, and whether the wand is activated or not, to the gesture generator module. A led on the labkit can be turned on when these modules detect the presence of the wand, and the 16-digit hex display can show the location of the wands.

Gesture Generator Module

Taking in the location of the two wands, this module considers snapshots of the movements of the wands and concludes by picking a gesture from a set of gestures. This gesture is output to the Map of Gesture to Signal module. The 4-bit gesture can be output on one digit of the 16-digit hex display.

Map of Gesture to Signal Module

This module takes in a gesture, looks up the corresponding signal code in BRAM memory, and passes the signal out to the IR Signal Generator module. This can be tested by using the switches to "pick" a gesture and the 16-digit hex display to verify the signal code being passed out is correct.

IR Signal Generator Module

Taking in the value of the signal data, this module reconstructs the infrared signal according to the timing specifications of the remote control which would normally control the device (TV). The output (one of: channel up, channel down, volume up, volume down, mute, power on/off) is passed to an IR transmitter. This can be tested by forcing the signal data with the labkit's switches and by analyzing the values being received by an IR receiver connected to an oscilloscope.

IR Signal Learning Module (if time permits)

This would allow another remote control to be emulated by the device. A user will activate a switch, signifying the beginning of a set sequence of signals being sent from the new remote to the IR receiver. This module can be tested by outputting the signal data about the current IR remote input to the IR receiver on the 16-digit hex display when inputting new signals.