

## Final Project Check-Off List

### 1.) Mouse Module

- a. Able to extract data output from a PS/2 mouse interfaced with the labkit
- b. Translates the data (change in x and y position) input from the mouse into actual coordinates on a 1024 x 768 display. Displays a cursor to show the position of the mouse to the user. Working module allows the user to control a cursor that moves around the screen.

### 2.) Character Recognition Module

- a. Mouse Cell Submodule : Using the x and y position information output by the mouse module, recognizes which part of the display the mouse is in.
  - i. Defines parameters of writing pad and 8 cells within writing pad
  - ii. If no button is clicked or if mouse is not in the writing pad, module outputs 4'1000.
  - iii. If a mouse button is clicked within the writing pad, the module outputs the 4 bit encoding to the cell the mouse is in.
- b. 4 bit output from Mouse Cell module is stored into a 16x4 memory block to represent the path the user traces with the mouse.
  - i. Memory stores the sequence of cells visited in order
  - ii. Conditions to write to memory
    1. Only writes to memory if the most significant bit of the mouse cell is 0
    2. A button must be held down to write to memory (user writes by holding a button down)
    3. Find\_finish (indicates that the Character Recognition module is not analyzing memory contents) is high.
  - iii. Write address resets to 0 if no buttons are held down
- c. Character Recognition Submodule : Decodes the contents of memory using an FSM and outputs the 7-bit encoding for the correct character
  - i. Cycles through an FSM using the contents of the memory block to identify the character written. The FSM determines the character encoding by analyzing the movement of the mouse through the 8 blocks of the writing pad
  - ii. Outputs a find\_finish signal (high if not searching)
  - iii. Only runs if mouse\_finish (high if not writing to memory) is high
- d. Implement lower and upper case letter, numbers, some symbols, and a backspace

### 3.) Display Module

- a. Static background display shows outlines for the writing pad and the recognized characters.
- b. Outlines of 8 cells drawn within writing pad

- c. Mouse Tracker Submodule
  - i. Displays mouse cursor on screen
  - ii. Displays trail of mouse as the user is writing within the writing pad
- d. Position Tracker Submodule
  - i. Identifies where the next recognized character should be displayed on the screen and outputs the coordinates to the display controller
  - ii. Working module allows user to write a string of characters that are displayed in a line on the screen beginning with the upper left-hand corner of the screen.
  - iii. Implements a backspace by moving the coordinates back to the previous slot.
  - iv. Upon reset, position resets to  $x=0, y=0$ .

**Time Permitting**

- 1.) Rescaling the writing pad to fit the size of the character written by the user
- 2.) Integrate the writing pad and recognized character display so the user writes in the space that the character will be displayed in. The writing pad moves along the display.

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