

Checklist for Deliverables for Final Project
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Need for Speed: Hacker's Trail

Mouse Input

1. Detect the location of the mouse cursor.
2. Output the (x,y) location of every single pixel the mouse cursor has traversed.

Video Input

1. Detect the glove pixels - identify the pixels at the glove locations.
2. Locate the user's hands - determine the location of the hands by computing the center of mass of the glove pixels.
3. Calculate the hand logic - convert the position signals to their corresponding logic signals (angle and height of the hands).
4. IF TIME PERMITS, adding logic for multi-player support.

Game Module

1. Resets game with initial car position, 0 velocity, etc.
2. Takes in wheel acceleration and updates vehicle speed accordingly.
3. Takes in wheel rotation and changes orientation.
4. Update the position of the car using the velocity state.
5. Detects collision according to the is_collided signal.
6. Keep track of some start line and updates lap number when car passes.
7. Keep track of score + other interesting stats.
8. IF TIME PERMITS, adding logic for multi-player support.

Graphics Module

1. Display the car positions onto the screen.
2. Display the track onto the screen.
3. Display positions of hand on a mini-display.
4. Display menu with stats.
5. Paints car sprites onto the screen.
6. Output correct collision signals back to the game module if, when painting car onto the screen, the car is found to be off the track.

Map Module

1. Load an empty map into RAM (frame buffer) on reset
2. Take in mouse inputs and create the track (using circular blob).
3. Uses an extra frame buffer ZBT ram for glitch-less real-time display.
4. Place mouse cursor on frame buffer in edit mode.

Car Sprite Module

1. Create car sprite (simple rectangle).
2. Uses a ROM for pre-drawn sprites.
3. Rotate sprites depending on the angle (simple, possibly with multiple sprites).
4. IF TIME PERMITS, use some rotation algorithm for more realistic sprites.

Circular Blob Module

1. Color pixels within a certain radius from the mouse positions given.

Text Sprite

1. Color pixels for characters corresponding to given input signals.

Possible Extensions

1. Audio outputs
2. Multiplayer support
3. Displays: Speedometer, Timer, etc.
4. Game Menus