Hacking the Wiimote and Wii Fit to help the Disabled

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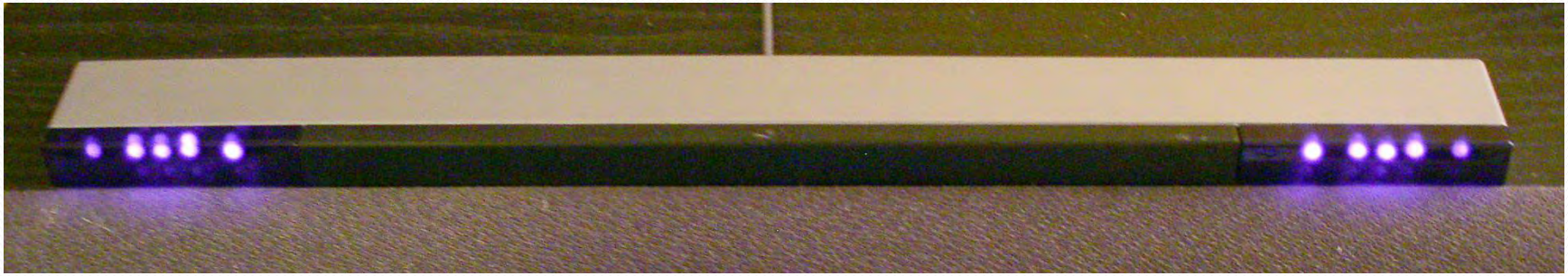
Introduction to the Wiimote

- Nintendo's controller for the Wii system
- Infrared camera in the front
  - Determines direction Wiimote is moving
  - How far the Wiimote is from the Sensor Bar
    - Sensor Bar is just 2 clusters of IR LEDs
    - Wiimote cluster coordinates to determine positioning
  - Track up to 4 IR sources



Why We Chose the Wii Platform

- Wiimotes are inexpensive ($40)
- Great infrared tracking capabilities
  - Up to 4 sources
- Bluetooth capabilities
  - Easy to relay information to computer
- Existing libraries that access wiimote data
  - wiiuse.net

Our Plan

- Provide more interface options for people with disabilities
- Infrared Tracking
  - Head to mouse tracking
  - Gesture recognition
- Weight shift tracking
  - Mouse simulation

Help the Disabled

- Head tracking to provide alternate mouse control
- Gesture recognition to reduce interface complexity
- Wii Balance Board for added mouse control

Infrared Tracking – Head Tracking

- Attach an infrared source to the head
- Enables head movement to mouse positioning
  - Wiimote tracks IR positioning on head
  - Relays the coordinates to create mouse positioning
- 3 Dimensional positioning
  - X and Y coordinates for mouse movement
  - Z coordinate to determine distance from the screen

Wii Balance Board Tracking

- 16 bit Pressure sensors in the feet
  - 1 on each corner (4 total)
- Calibrate initial pressure
- Returns pressure displacements

Long Term Goals/Possibilities

- Sign language recognition
- More user interface capabilities and controls
- A simpler design (less wires and power used)

Wii love you all!

Thank You For Coming!