Extended Sight with EOG

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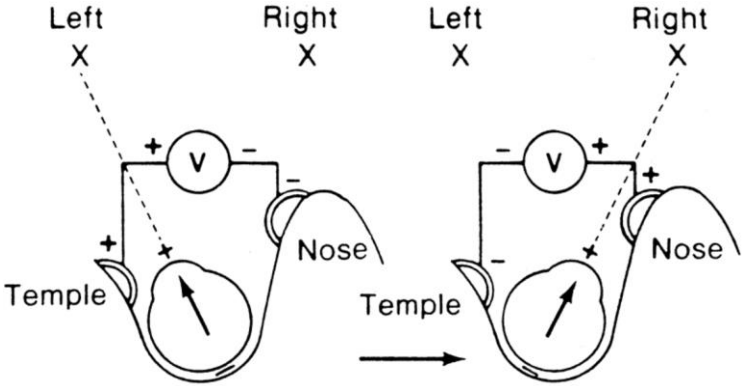
EOG Overview

What?

EOG = Electrooculogram

How?

Eyeballs as dipoles -- can measure the potential between to determine the position of retinas



Why?

Similar systems to this have played a key role in communicating with people who have limited movement capabilities. This system can help expose others to how this technology and interface works.

Image source: http://www.oculist.net/downaton502/prof/ebook/duanes/pages/v8/ch104/001f.html

EOG Continued

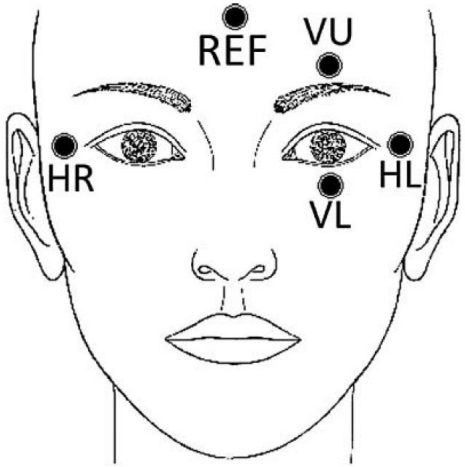
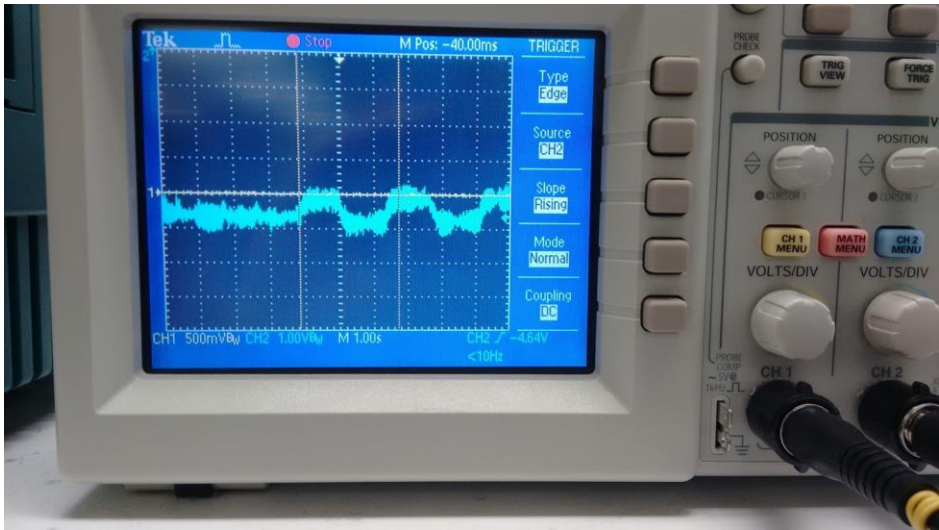


Image source: *Applied Bionics and Biomechanics* “Interface based on electrooculography for velocity control of a robot arm”

Probes on VU and VL, looking up and down at 1 second intervals:



Our Project

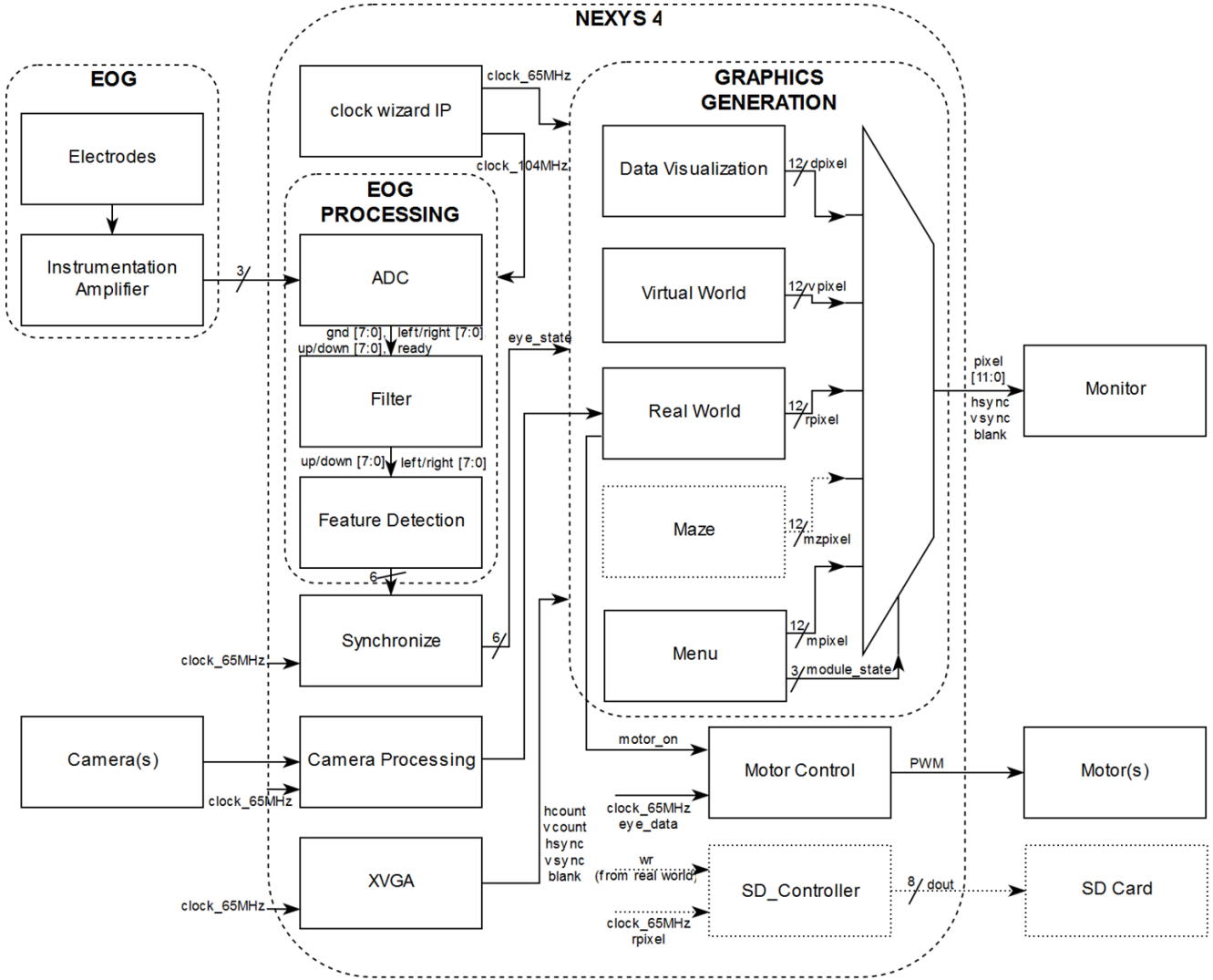
Interactive EOG display, with several main modes:

- Data Visualization: Eyeball simulation
- Real World: The user controls a camera on a motor with their eye movement
- Virtual World: The user controls a virtual camera in a virtual world (probably a cube)
- Menu: To move between the different modes

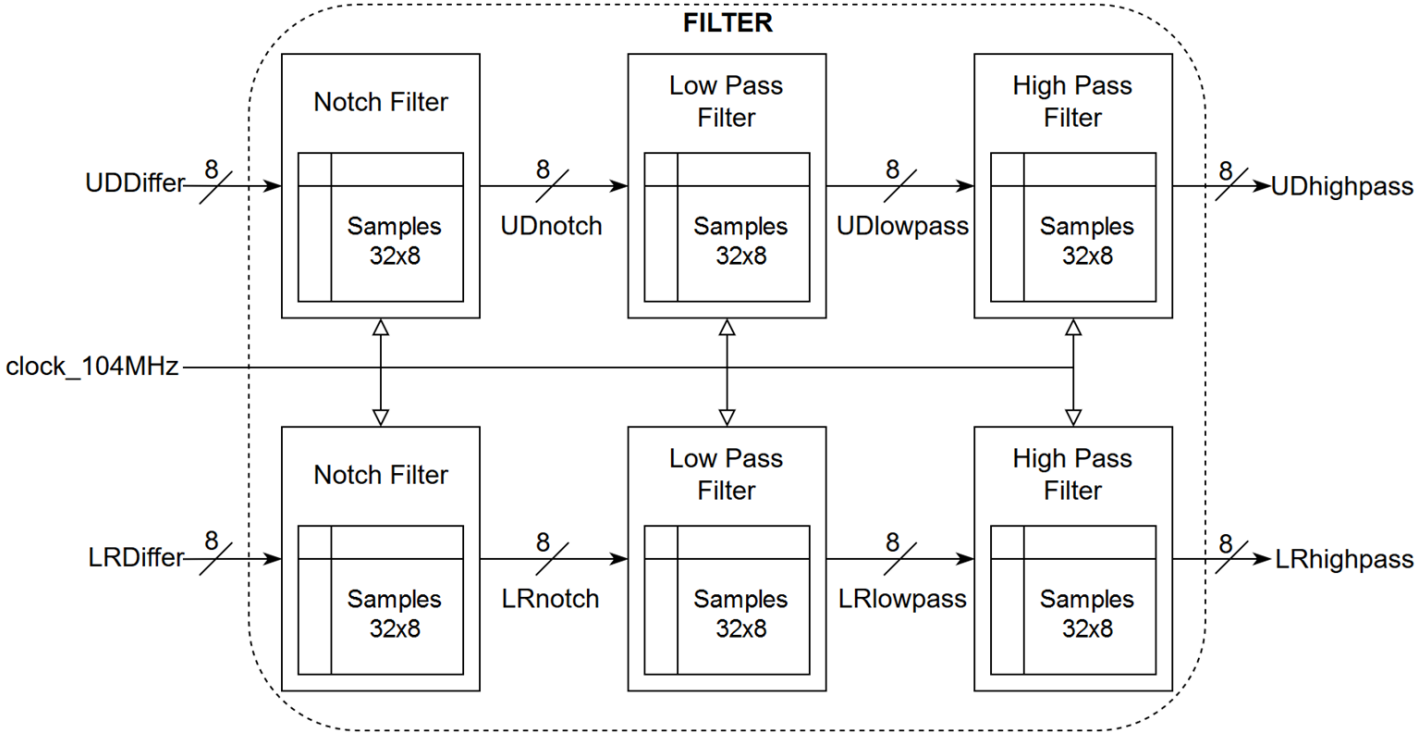
Stretch goals:

- Taking pictures, more cameras
- Maze game, more complex virtual world

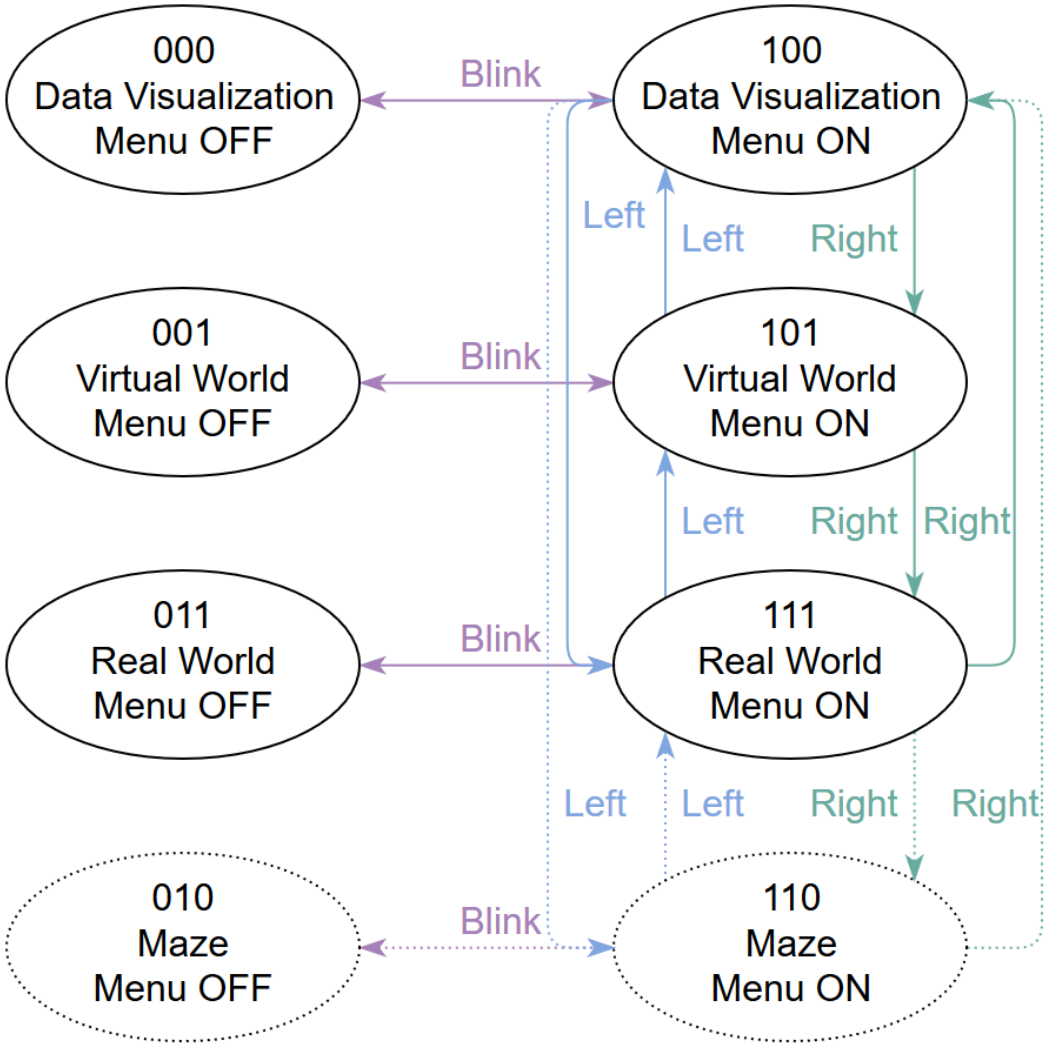
Overall Block Diagram



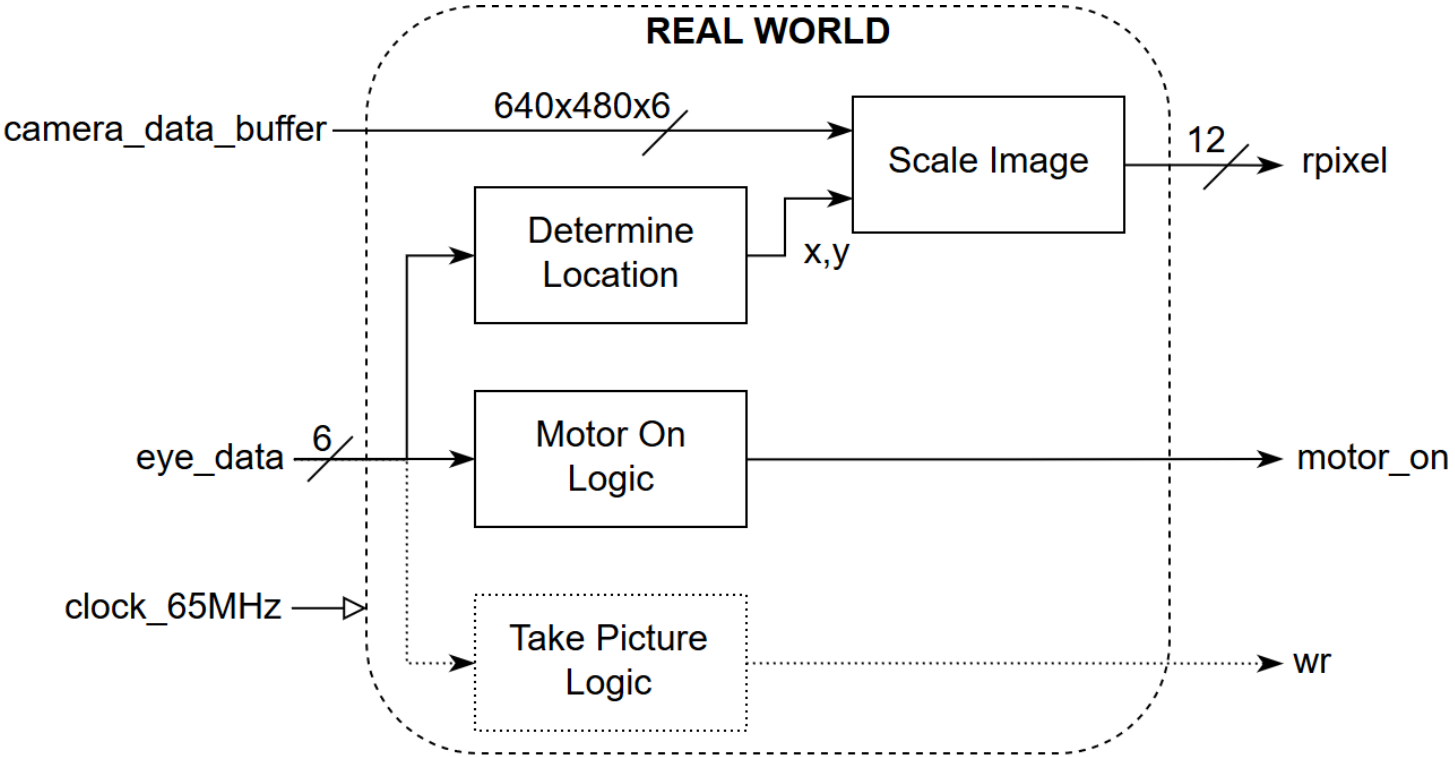
Major Module: Filter



Major Module: Menu



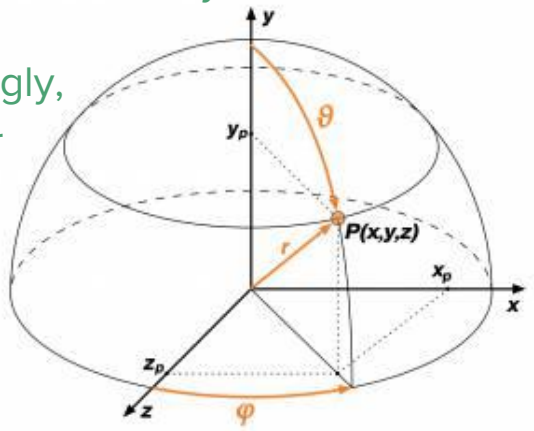
Major Module: Real World



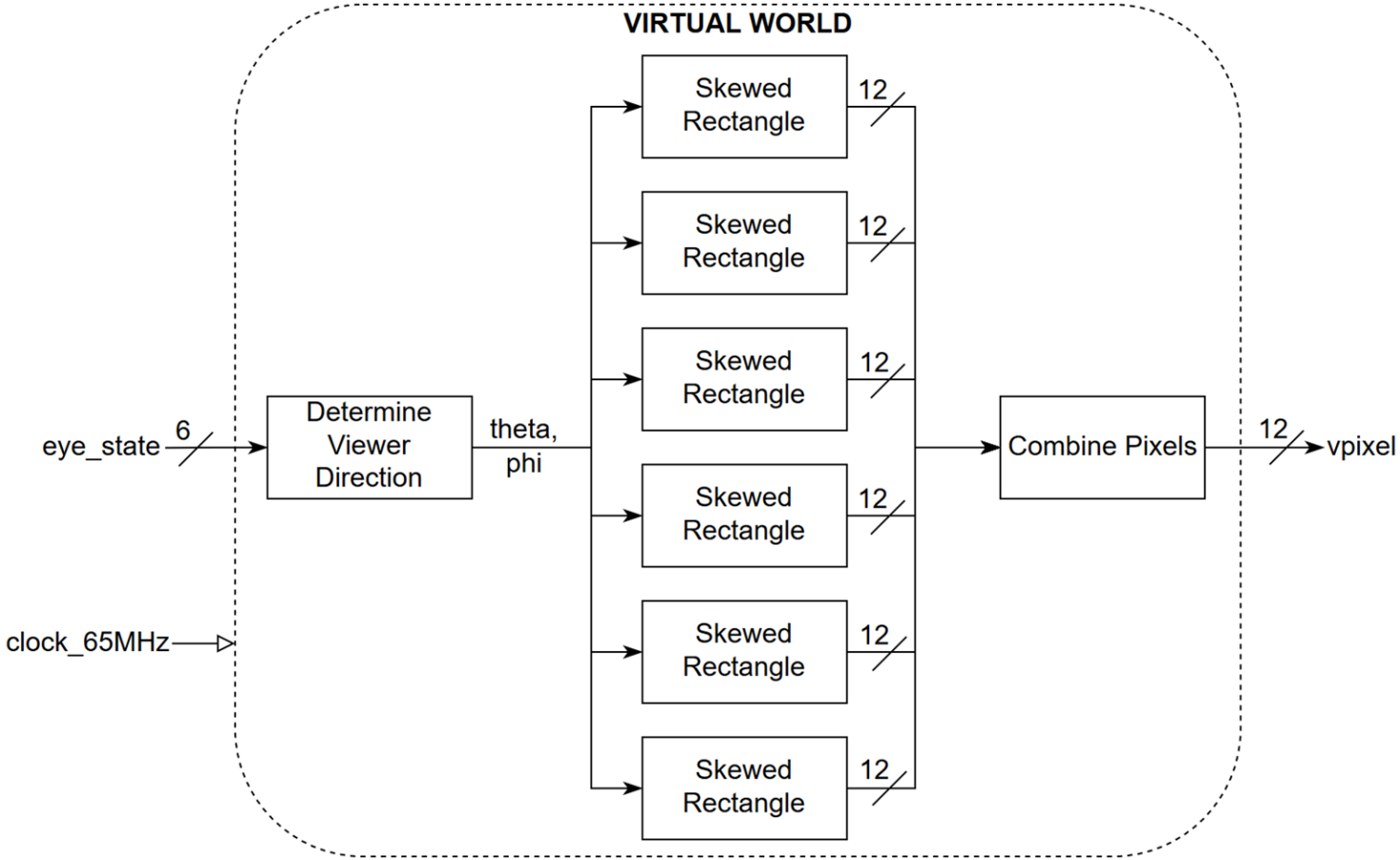
Major Module: Virtual World

Would take too much memory to store a virtual world that realistically 3D

- Generate it!
  - Rectangles good for simulating perspective
  - Simple: In “room” with different colored walls
- Viewer at center of spherical coordinate system
  - Skew rectangles accordingly, based on direction viewer is facing



Major Module: Virtual World



Timeline

task	10/31-11/6	11/7-11/13	11/14-11/20	11/21-11/27	11/28-12/4	12/5-12/11
EOG hardware and ADC						
Data visualization + menu						
Filter and feature detection						
Real world + camera						
Virtual world						
Integration						
Motor Integration and mount						
STRETCH: Taking pictures						
STRETCH: Maze game						

Questions?