



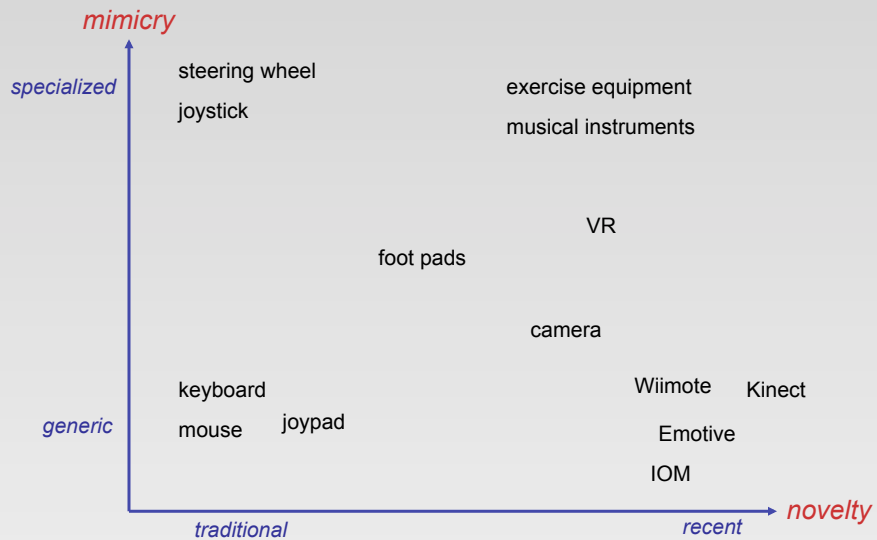
Input Controls: Beyond the Keyboard, Mouse and Joypad

Technical Game Development II

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Think about...

Which of these ideas you could apply to your game !

Embrace alternative controllers



We haven't made a joypad game since 2003



Camera



Guitar



Microphone

[From Harmonix presentation, IMGD Seminar 2/7/08]
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Guitar + Drums + Microphone!

We've noticed some big user benefits...

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They look like what they do



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It's obvious how to use them



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Joypads

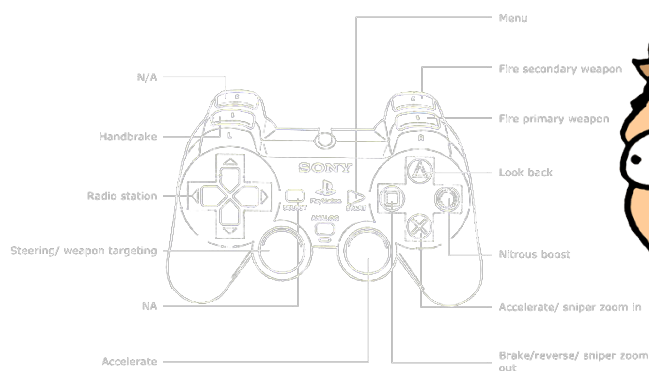


- Generic by design
 - So can't “look like what it does”
 - No mental model for how to use it

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Today's joypads are intimidating



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These controllers are inviting



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They level the playing field



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Ensure intuitive controls

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Intuitive Controls

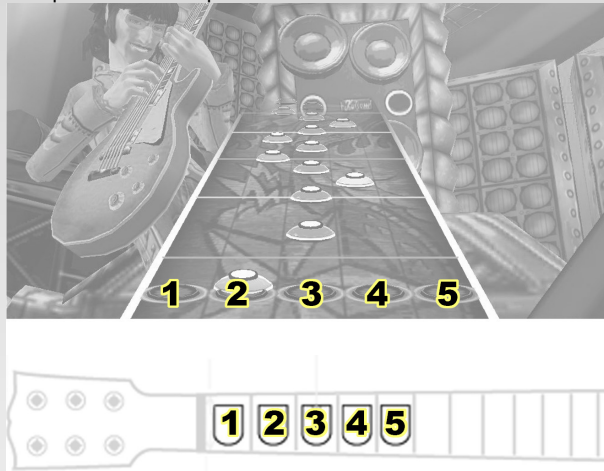
- It just works
- This is our responsibility
- Employ usability principles

[From Harmonix presentation, IMGD Seminar 2/7/08]
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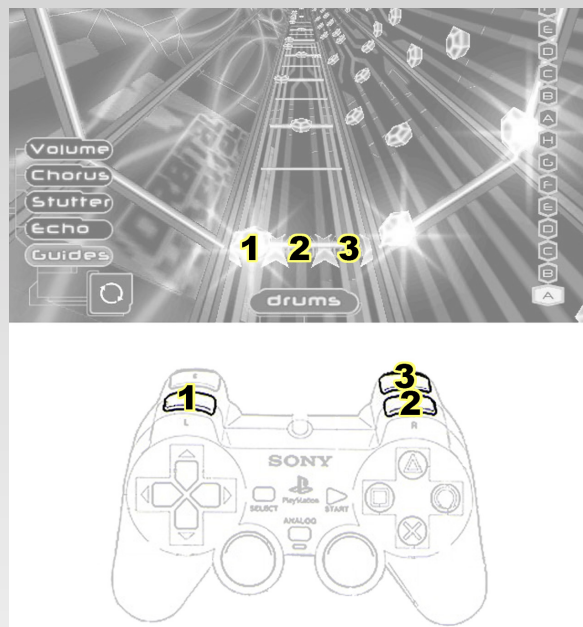
Natural Mapping

Spatial relationship between control and result is consistent



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Dance Pad



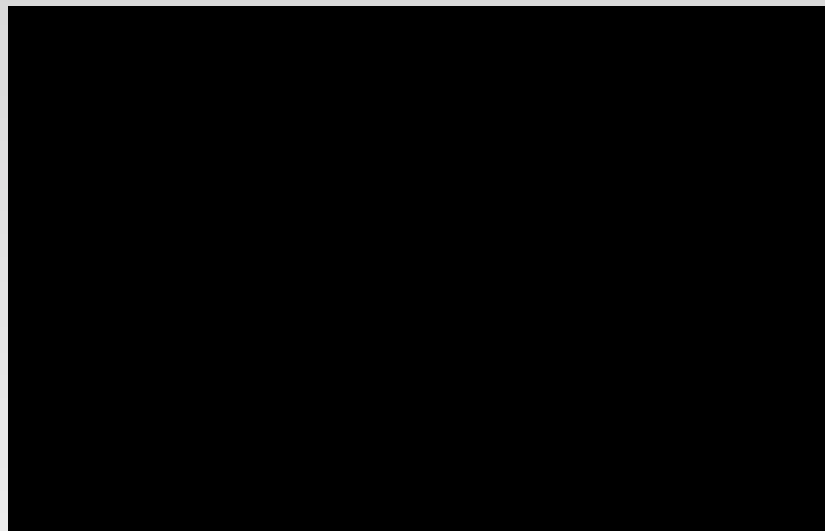
Diamond Park



Inertial and IR Sensing

- Wiimote
 - finger tracking [\[video\]](#)
 - head tracking [\[video\]](#)

Wii Finger Tracking



Wii Head Tracking

Head Tracking for Desktop Virtual Reality Displays using the Wii Remote

Johnny Chung Lee
Human-Computer Interaction Institute
Carnegie Mellon University



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Using Cameras and Computer Vision

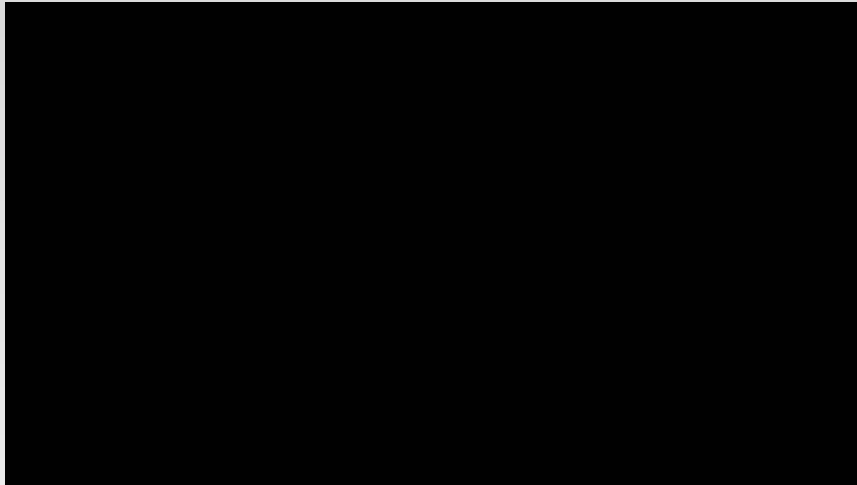
- Kinect (for Microsoft XBox 360)
 - RGB camera
 - infrared depth sensor (IR laser projector+sensor)
 - microphone array
 - \$150 (free SDK)



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Kinect



Augmented Reality

- Eye of Judgement [\[video\]](#)
- Lab Demos [\[2 videos\]](#)

Eye of Judgement



Augmented Reality



Augmented Reality



Virtual Reality

- Prof. Lindeman's TactaVest [\[video\]](#)

part of the "Playstation 6"

TactaVest



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Neural and Bio Feedback

- Heart rate and skin conductance
 - Wild Divine IOM *[video]*
 - <http://www.meditations-uk.com/products/wilddivine.html>

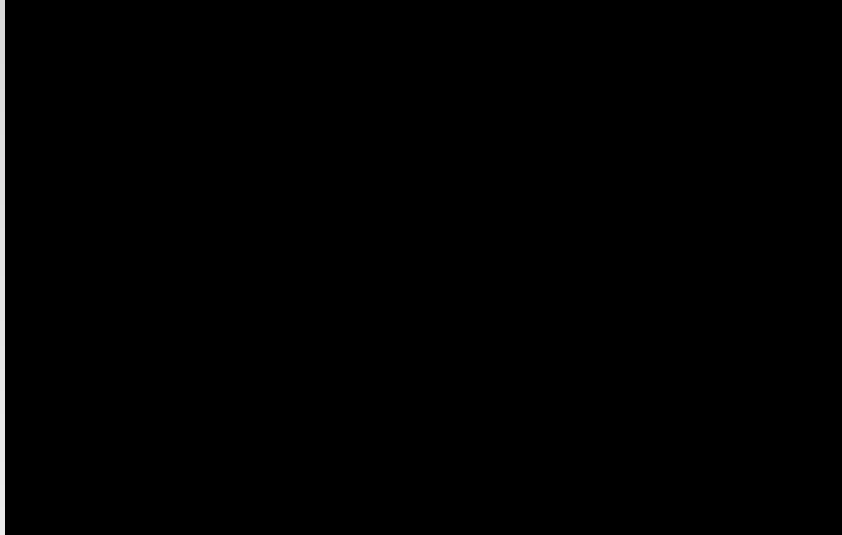
- Neural activity (EEG)
 - EmotivePOC *[video]*
 - <http://www.emotiv.com>



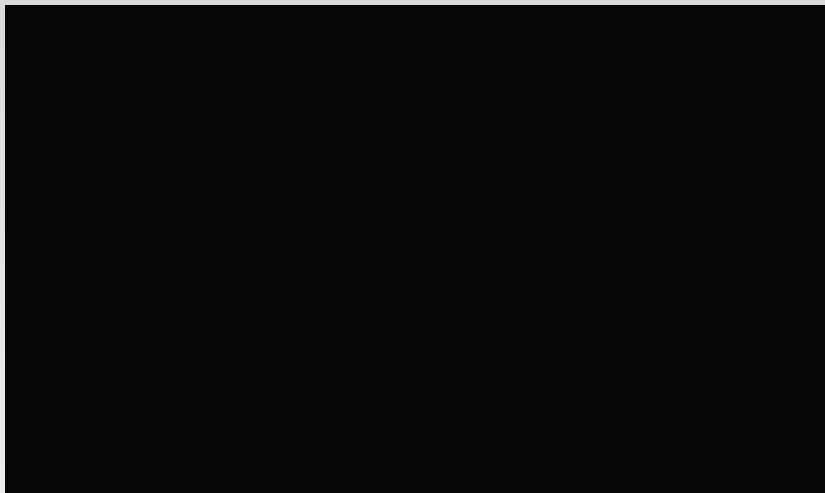
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Wild Divine IOM



Emotiv



Other Input Control Ideas

- Speech
 - cheap, easy to get
 - slow, unreliable (esp. in noisy env.)

- “Embodied Gaming”
 - e.g., robosoccer with Sony Aibos (see next slide)



Input Controls Summary

- What can you do with _____ that you *couldn't do* before?
- What's *more fun* with _____ than with previous technologies?
- Does _____ *enhance* game play, rather than replacing traditional controller?

[From Z. Drake, GDC'08]



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