Input Controls

Technical Game Development II

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For more: Take Prof. Lindeman’s new course on “HCI for Real, Virtual and Teleoperated Environments” (IMGD 3XXX) in A 09...

mimicry

specialized

steering wheel
joystick

exercise equipment
musical instruments

foot pads

VR

camera

keyboard
mouse
joypad

Wiimote
Emotive
IOM

generic

recent

novelty

traditional
Embrace alternative controllers

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)

We haven’t made a joystick game since 2003

Camera               Guitar          Microphone

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)
Guitar + Drums + Microphone!

We’ve noticed some big user benefits…

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)

They look like what they do

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)
It’s obvious how to use them

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)

Joypads

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

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)
Today's joypads are intimidating

These controllers are inviting
They level the playing field

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)

Ensure intuitive controls

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)
Intuitive Controls

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

Natural Mapping

Spatial relationship between control and result is consistent

[From Harmonix presentation, IMGD Seminar 2/7/08]
IMGD 4000 (D 09)
Other Physical Input Devices

- Foot (dance) pads [video]
- Exercise equipment
  - www.exerciseinabox.com [video]
  - Diamond Park [video]
Dance Pad

www.exerciseinabox.com
Inertial and IR Sensing

- Wiimote
  - sports games [video]
  - finger tracking [video]
  - head tracking [video]
Wii Tennis

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

Using Cameras and Computer Vision

- EyeToy for PS2
  - AntiGrav (Harmonix) [video]
    - face tracking
    - template matching
    - rough pose estimation
  - and many others (see EyeToy wikipedia page)
AntiGrav

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”
Neural and Bio Feedback

- Heart rate and skin conductance
  - Wild Divine IOM [video]

- Neural activity (EEG)
  - EmotivEPOC [video]
    - http://www.emotiv.com
Wild Divine IOM

Emotiv
Game Design Ideas using EmotivEPOC

- What can you do with EPOC that you \textit{couldn’t do} before?

- What’s \textit{more fun} with EPOC than with previous technologies?

- EPOC \textit{enhances} gameplay, rather than replacing traditional controllers

\textit{[From Z. Drake, GDC’08]}

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Example Emotiv Game Applications

- Spontaneous avatar animation for MMORPG and virtual world situations: why “/wink” when you can just wink?

- NPC interactions in RPGs: don’t just select the “friendly” or “angry” dialogue choices.

- \textit{Clench}: a good conscious, short-term, low-latency detection that your player is unlikely to trigger unintentionally.

- Remember to go easy on your players’ physiology!

\textit{[From Z. Drake, GDC’08]}
Example Emotiv Game Applications

- **Excitement**: modulate music volume, crowd excitement, graphical flourishes.
- **Difficulty modulation**: excitement, frustration
- **Game testing**: quantifiable user data
- **Mental challenges**: complete a task while remaining focused, meditate to restore mana

[From Z. Drake, GDC’08]

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Example Emotiv Game Applications

- Some things are just more fun to do with your mind than with a button!
- **Manipulating objects**: Telekinesis (push, pull, lift, etc), Disintegration (disappear)
- **Social manipulation**: using pull as a social attractor
- Think of a cognitive action as a “super combo” or elaborate “special move” rather than as a button press.

[From Z. Drake, GDC’08]
Emotiv Training

- Make training part of the game
- Training in-context works better than training in a completely different environment
- Allow players to return to training when they want
- Save profile information

[From Z. Drake, GDC’08]

Other Input Control Ideas

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

- “Embodied Gaming”
  - e.g., robosoccer with Sony Aibos
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]