Wiimote Interfaces for Lifelong Robotic Learning

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About Me

- Junior at Brown
- Studying math and CS
- I love working with robots
What Got Me into CS (and AI)

- Initial interest in CS
  - Early exposure to computers and video games
  - Science fiction
- What got me into AI:
  - Seeing Aibos play soccer
When I Grow Up, I Want To Be A...

- Astronaut
- Rock Star
- Toys R Us kid
- Why not...
  - Google engineer?
  - Roboticist?
  - Computer scientist?
- Need to fix the “American Idol” problem
Cultivate Immediate and Long-term Interest

• Immediate: “Get them to consider CS”
  – Show flashy videos (graphics)
  – Interactive systems and demos (our robots)
  – Let them create things with 'magic' (libraries)

• Long-term: CS as a topic of substance
  – Robot Learning from Demonstration(video)
Wiimote-based Robotics

- Compel immediate interest with cool technology
  - Robots
    - Aibo
    - SmURV
- Wiimote interface to control robots
Wiimote Interface

Moves:
- Kick
- Blocks
- Trap

Walk

Tilt of nunchuk
Tilt of wiimote
Wiimote-based Robotics (cont'd)

- Viscerally compelling
  - Combines two kinds of hot technology
  - Unique, physically-motivated control interface
- Quick learning curve
  - Usually < 30 sec
- User video
Kids LOVE This Game
Crossing the Human-Robot Divide

- Problem: how to put your control policy on a robot
- For example
  - Joe buys an Asimo
  - It's very cool
    - Runs like a human!
    - Walks up stairs!
  - How does he teach it?
    - Doesn't know how to program
Personal Computer Revolution

- Easy to use
- Good interface
- Good price point
- Three levels:
  - Hardware
  - Development
  - Software
Where's the Personal Robotics Revolution?

- **Hardware**
  - Lots of available robot platforms
- **Development**
  - Plenty of libraries and tools
- **Application level...**
  - Where is the
    - spreadsheet app?
    - Maya?
    - Web browser?
- **Still missing basic interactions**
- **Our solution: in video**
Interface Details

Score

Seg. Video
~30Hz

Motors

Video
~1 Hz

We are connecting to a dog.

Brown University Robotics Group
Entertaining Robot Control
Results

- Public demos
  - RoboBusiness '07 (Boston)
  - Robocup '07 (Atlanta)
  - AAAI '07 (Vancouver)
  - Various public demos, beta test (Brown)
- Overwhelmingly positive response to the interface, both Wiimote and GUI
Where We're Taking This

- Finish developing the game
- Start logging user data
- Deploy across the world!
- Learn to play robot soccer from demonstration
- Excite people about computer science
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