Personal Robots for CS1

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- Begun July, 2006 from a grant from Microsoft Research
- Awarded to Georgia Institute of Technology with Bryn Mawr College
- Develop a robot, software, and curricular materials for CS1 and CS2
- Attract and retain students in computing
IPRE Principle Investigators

- Tucker Balch, Director, GATech
- Douglas Blank, co-Director, BMC
- Mark Guzdial, GATech
- Deepak Kumar, BMC
- Stewart Tansley, MSR
IPRE’s Philosophy

- Use a Personal Robot
- Let the needs of the curriculum drive the design of the robot, software, and text
- Use tools that are easy to use, but scale with experience
- Create an accessible, engaging environment for new, diverse students
- Computer Science ≠ programming
- Make computing a *social activity*
- Make computing a *medium for creativity*
- Performances vs. competitions
Medium for Creativity + Social Activity
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“Sometimes the competitive boys just suck the life out of the class.”

-Monica Anderson
What kind of robot to use?
“Got bored with given task; programmed it to play hokey-pokey”
-Michael Dumont
IPRE Pilot Hardware Kit with Scribbler

- 3 Light sensors
- 2 IR sensors
- 2 Line sensors
- Stall sensor
- Speaker
- 3 LEDs
- 2 motors
- Bluetooth wireless
>>> from myro import *
Myro, (c) 2006 Institute for Personal Robots in Education
[See http://www.roboteducation.org/ for more information]
Version 0.8.0, Revision 1.80, ready!
>>> robot = Scribbler("com4")
Waking robot from sleep...
Hello, I'm Scribby!
>>> beep(1, 800)
>>> joyStick()
>>> ^D
Reading the Light Sensors

getLight("left")
getLight("center")
getLight("right")
getLight()

[657, 1453, 1025]
Figure 3
Vehicles 2a and 2b in the vicinity of a source (circle with rays emanating from it). Vehicle 2b orients toward the source, 2a away from it.
Chapters Outline

- **Chapter 1** The World of Robots
- **Chapter 2** Robots: Personal or Otherwise
- **Chapter 3** Sensing the World
- **Chapter 4** Making Decisions
- **Chapter 5** Behaviors
- **Chapter 6** Robot Artist
- **Chapter 7** Making Music
- **Chapter 8** Communication
- **Chapter 9** Artificial Intelligence
- **Chapter 10** Computing & Computation
What kind of robot to use?

Robot for Robotics

Robot for Pedagogy
## What kind of robot to use?

**Robotics:**
- Put as much intelligence into as possible
- Expensive
- Sensitive

**Pedagogy:**
- Leave out most of the intelligence
- Cheap
- Robust
- Create open ended, creative opportunities
Chat (IM) Interface

c1 = Chat("sarah", "myPasswd3")
c2 = Chat("joe", "sEcrEt")
c1.send("joe", "Hi, what’s up?")
c2.receive()

[('sara@myro.roboteducation.org', 'Hi, what’s up?')]

Where’s the robotics?
Creative interfaces

- Ability to draw
- Ability to make music/tones
- Ability to play sounds and talk (play WAV files)
- Ability to express
- Ability for robot interaction
IPRE Next Steps

- Software “Myro” to be implemented in .NET/Mono
- Use IronPython, but be language agnostic
  - JavaScript, Ruby, Python, VB, C#, etc.
  - Use Dynamic Language Runtime (DLR)
- Standardized interface across languages
- Ability to work in a single framework
- Simple IDE, simple graphics
- Take advantage of Microsoft Robotics Studio
- Explore hardware designs for the perfect personal robot for education
Thank you!