

T : A :: L : K Day

- Teaching by Adults, Learning by Kids
 - Bad analogy!
- Teach/learn
 - Two sides of same rock
- Both roles played by kids and adults
 - and everyone in between
 - all the time

Schedule

- Rik Belew: Welcome
- Craig Mautner: Evolving robots
- Julie Humphrey: How I did it
- Cardiff Kids: Demos
- Rik: Wrap

1:30 - Cardiff Group onto buses

- Everyone else: Debrief

CSE Dept

- Fran Berman
- Gary Cottrell
- Grad students
 - Ted Carson
 - Matt Dailey
 - Jessica Friis
 - Craig Mautner
 - Ben Shapiro
 - Bryan Tower
 - Lee Belew

Visitors

- Preus School
 - Dorothy Alvarez
 - Tracee Parsons
- Teacher Education Program
 - Noah Finkelstein
- Ada Harris School (Cardiff, CA)
 - Joanne Burnette
 - Sue Yant
 - Liz Goldmann
 - Julie Humphrey
- Lego
 - Lynn Crockett (Legoland)

Thanks!

- **NSF**
CISE Directorate
4201 Wilson Blvd, #1105
Arlington, VA 22230
cise-webmaster@nsf.gov
#CDA-9617307
- Apple Computer
- Encyclopedia Britannica

My perspective

- Computer Science & Engineering
- Artificial Intelligence Lab
- Machine learning
- And I'm a parent!

Artificial Intelligence Lab

- Performing tasks we (people) think are smart
- Chess, medical diagnosis, recognizing speech, ...
- Catching a fly ball

Machine learning

- “Inductive programming”
- Role of teacher
- Active learning
 - “Exploration vs. exploitation”

And I'm a parent!

- 2 in Cardiff Schools
- One an undergrad at UC Santa Cruz

Why Mindstorms?

- (Not: Research supported by Lego!)
- “Mindstorms will *never* make money for Lego.”
 - (*sez toy compamy competitor*)
- Simple toys are windows into wonder
 - Can provide the “critical confusion” teaching needs
- Hacker participation!
 - NQC, legOS
 - Open Source

Programming Examples

- SpiderWalk
- Candycane
Grasshopper

SpiderWalk

```
#define e 68

task main()
{
    SetSeonsor(SENSOR_2,SENSOR_LIGHT);
    OnFwd(OUT_A+OUT_C);

    while(true)
    {
        if (SENSOR_2 > e)
        {
            Off(OUT_A + OUT_C);
            OnFwd(OUT_A);
            Wait(200);
            PlayTone(300,100);
        }

        OnFwd(OUT_A + OUT_C);
    }
}
```

Candycane Grasshopper

```
#define candycane 68
#define HOLDIT 50
sub light()
{
    OnFwd(OUT_A+OUT_C);
    PlaySound(5);
}
sub dark()
{
    Off(OUT_A+OUT_C);
    On(Out_A);
    Wait(HOLDIT);
}
task main()
{
    while (true) {
        if (SENSOR_2 > candycane) {
            light();
        }
        if (SENSOR_2 < candycane) {
            dark();
        }
    }
}
```

CSE151 will have things to show too!

- Started about 3 weeks ago
- Have A LOT going on in their lives
- Some sophisticated tasks
- CSE151 announcement
 - Projects due MONDAY (15 May)
- Some will come to Ada Harris to demo (I hope)

Kids can program!

- We have evidence!
- Computers are the ultimate mind tool
 - But everyone's mind is different
- EVERY discipline using computers, more all the time
 - Eg, BioInformatics for the Human Genome

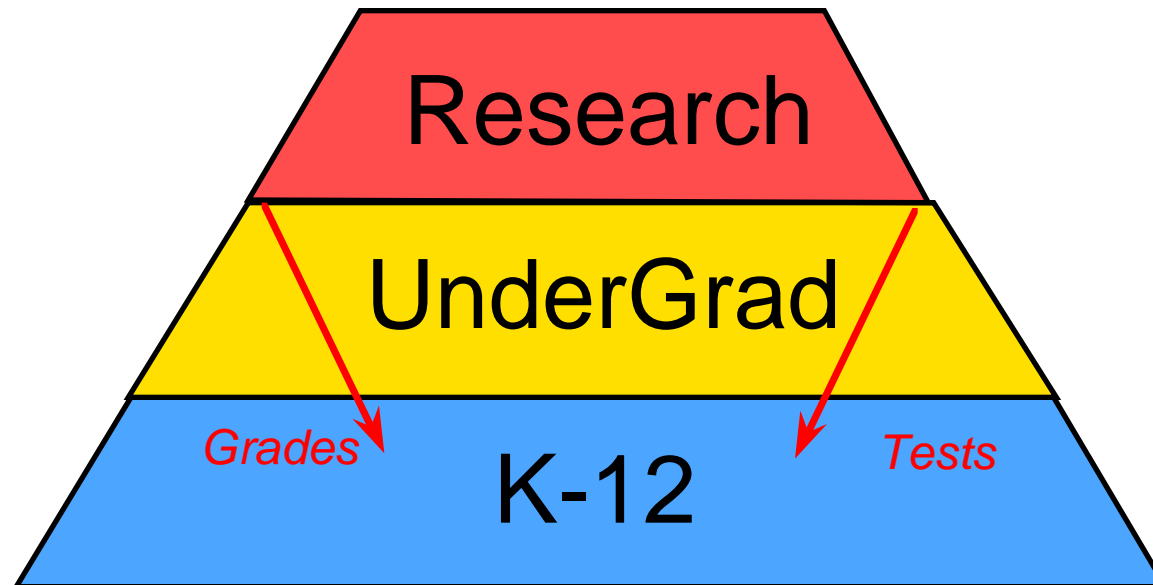
Kids can program! (cont)

- Software is THE 21st century commodity
 - Know how to MAKE it (program)
 - Buy it from Bill
- If 4th graders can begin, EVERY UGRAD CAN LEARN!

Media for teaching

- Face2face classroom!
 - vs. 'distance learning'
- WWW
 - Before arriving in class
 - After the lecture
- Manipulables

Grade levels seem obviously connected...



Stay curious!

The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvelous structure of reality. It is enough if one tries to comprehend a little of this mystery every day.
- Albert Einstein (1955)

