Robots, robots, everywhere

CS 4 HS, July 20 – July 22
What are robots capable of?

- Build cars
- Vacuum rooms
- Toys
- Search and rescue
- Elder care
- Space exploration
- Surgery
- … and more!
RoboCup Challenge:

Design a team of robots that can play soccer (and beat human team by 2050)

We have a looong way to go until 2050…
Can we do it?

- What is the current state of robotics?
  - From Shakey to ASIMO (video)
  - DARPA Grand Challenge (2004 vs. 2005)

- We have 43 more years
  - What were computers like about 50 years ago?
CentiBOTS Project

Distributed Multi-robot Exploration

- Exploration and surveillance of large indoor environments
- Joint project with SRI International
Robots, Robots, Robots!
Mapping the Allen Center: Raw Data
Mapping the Allen Center
Localization

- How do you know where you are in a map?
Localization
What goes into the Mars Rover?

- Computer vision: Interpreting pictures
- Kinematics: Move the rover, mechanical arm
- Artificial intelligence: Understanding, autonomy
- Physics: Power supplies, power regulation
- Electrical engineering: robot’s processor
- Computer science: software to control everything!
- Geology: Rock sampling tools
What does this all mean for you?

- Can show students what’s “out there”
  - Find out how your field intersects with robotics

- Show students interesting problems that have been solved and new ones that need to be solved.
  - DARPA Urban Challenge

- There’s so much to do! We got 43 years to create a world-class soccer team!