

## Artificial Intelligence

Can Machines THINK?



- 1997 Big Blue played Gary Kasparov?? and lost then reprogrammed and one
- Did Big Blue think like Gary
- Does a neural network really assimilate facts to make decisions or does it do a lot of IF...THEN statements really FAST

## Artificial Intelligence

- Computers that seem to exhibit human intellectual behavior.
- Can react to all five of our senses

See  
Hear  
Smell  
Feel  
taste

Pattern recognition-face, parts  
Carbonic  
Environmental Monitoring  
Data analysis and other  
Medical applications  
Appliances TV, Stove, Word processing  
Test for poisons  
us@delphi.com

## Some Definitions of Intelligence

- Ability to learn from experience
- Ability to think
- Ability to reason
- Ability to perceive relations
- Ability of having intuition
- Ability to use tools

## Teach or program a computer to act intelligently?

- Do you TEACH a child to walk?
- Do you program a robot to walk?
- Learn to Balance
- Learn to take a step
- Learn to put two together
- Apply that to both legs

- Robotics
- Asimo
- By Honda



*World Cup in the not to distant future*

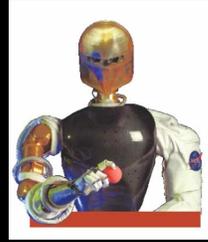
[RoboSoccer](#)

[RoboCup](#)

[More Videos](#)



- Robonaut By NASA to repair out side of space station



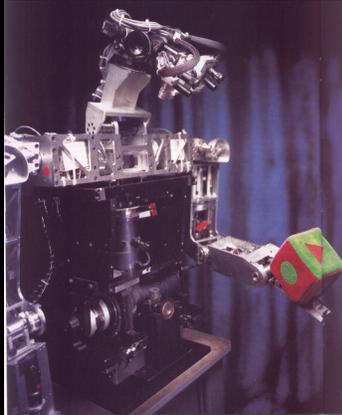
Stereo Color camera eyes



Five fingered hands that have force and tactile feedback gloves

Articulated neck

- COG
- By MIT



What should a robot look like?



Basic



Best



Better

*Robotic Realism??*



Three fingers will do



Five is better to handle tools also used by humans



Transistors embedded in plastic to detect pressure and temperature

**Cindy Smart doll**

- Contains two 16bit microprocessors
- Voice recognition software
- Digital camera in her chest
- Does simple math, recognizes basic shapes and colors, responds to 70 questions and reads flash cards, has a vocabulary of 650 English words, and a few words in German, Spanish, Italian and French
- Invented by Toy Quest: cost \$99
- [www.Toyquest.com](http://www.Toyquest.com)



- Other Robots don't try to look human



The latest Version

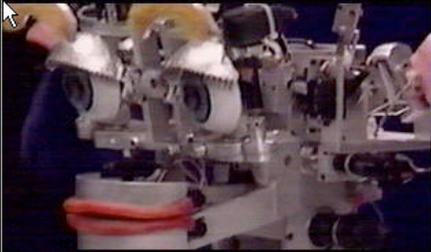


The more you teach him the smarter he gets! Straight from the labs of the Institute of Robotic Technology, TEKNO features the latest in HiTech circuitry and digital sensory input devices. All the technology housed within the puppy enables true emotions and real time moods. Fully articulated, with animated eyes, ears, and tail, TEKNO possesses voice activation and an internal clock to adjust to your lifestyle. Learning and memory are empowered by the integrated circuitry and microprocessor that controls all of TEKNO's functions. Teach TEKNO how to - speak -do a card trick - sing and dance - say his name. Ears flap up and down! Eyes light up with emotion. Tail wags side to side. And he walks!

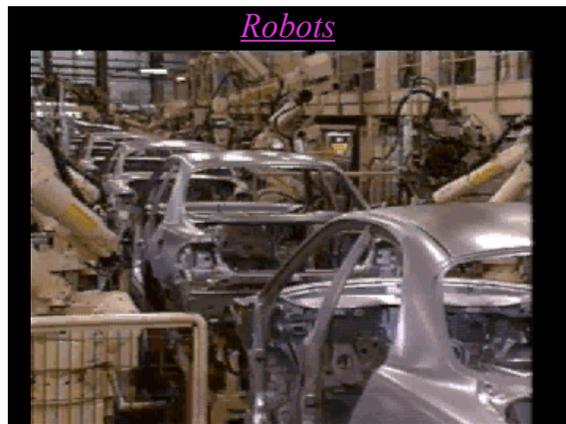
Can Robots show emotion?

**COOL CAT**

The notion of robot as home companion is nothing new, but iCat adds a human dimension to the job: an expressive face. Tell her to go away, and iCat will look sad. Praise her, and she will beam. Internal microphones can be used to record sounds and assist with speech recognition—iCat is multilingual—and 13 electric motors move her eyes, eyebrows, eyelids.



TIME, NOVEMBER 21, 2005



*Robots*

- Many sensors and arms suited for:
  - Saving Labor costs (24/7)
  - Giving Consistent quality
  - Working in Hazardous environments
  - Lifting and moving heavy items
  - Doing repetitive boring jobs
- Word “Robot” comes from the Czech word for “forced labor”

*Robots*

- Computer's perform mental tasks
- Robots perform physical tasks

## What can machines do ?

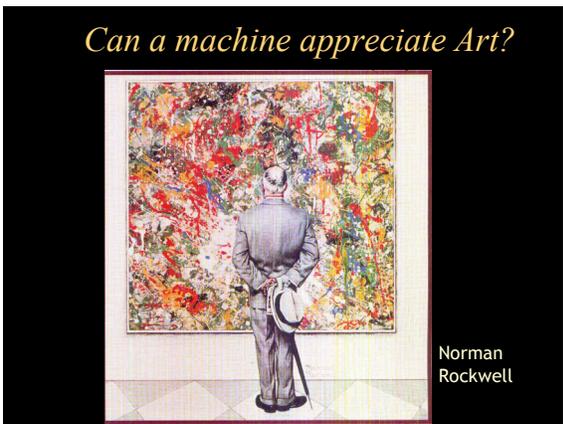


## Will Robots like “Hal” take over?

“There are certain tasks which computers ought not be made to do independent of whether computers can be made to do them”

Joseph Weizenbaum  
Developer of Eliza

## Can a machine appreciate Art?



## The Turing Test

A Human types in a question to another human and a computer.

The questioner must decide which answer comes from the human.

[ELIZA example](#)

- Sometimes computers can be rather frustrating because we ask them to do things they either can't do or probably should not do!

## AI: Natural Language Understanding

- AI researchers would like to develop a machine that understands the words spoken by a person (natural language)
  - [Example](#)
- Problems: a “parsing program” was required to break down words from one language and convert them into another
- Sometimes the meaning was lost in the translation.
  - “Out of sight, out of mind” became =
  - [Invisible idiot](#)
  - “The spirit is willing, but the flesh is weak” became
  - = The wine is agreeable, but the meat is rotten

### *AI: Intelligent Software Agents*

- assist the computer user by managing other computing tasks
- are semi-independent, that is, can act autonomously, but may be controlled by the user
- can learn from practice as well

### *AI: Intelligent Software Agents*

- An agent that selects/buys appropriate Christmas presents
  - specify age, sex, relationship, interests, the event
  - Some search the Web, then list the items that make a good match.
- Search for the best buy for a flight
- PDA (Personal Digital Assistant) many are in small hand held systems (Palm Systems)

### *AI: Meeting Organizer*

- Meeting organized.
  - Specify, topic, preferred time slots, people
  - System automatically contacts each person
    - states topic to be discussed
    - offers selection of times
    - negotiates times if selection is in conflict
    - emails all of final time and place

### *AI: Email Organizer*

- Based on your past email activity
  - prioritizes the list
  - eliminates the ones you usually don't read  
Spam stuff

### *AI: Expert/Knowledge Base Systems*

- Expert/Knowledge base Systems.
- are software programs designed to replicate human decision-making processes
- are employed in the practice of specialized areas of knowledge
- rely upon explicit knowledge bases that represents their areas of specialty

### *Expert/Knowledge Base Systems*

- The medical field was one of first to use an Expert System called MYCIN to help diagnose patients diseases.
- Blue Cross/Blue Shield of VA uses it to determine if a claim should be paid.
- DEC used one to configure complex computer systems. (did work of 300 people)