Computer Vision (CSE/EE 576)

Staff
- Prof: Steve Seitz (seitz@cs)
- TA: Aseem Agarwala (aseem@cs)

Web Page
- http://www.cs.washington.edu/education/courses/cse576/03sp/

Handouts
- intro lecture
- filter lecture
- signup sheet
- account forms

Today

Overview of Computer Vision

Overview of Course

Images & transformations

Readings for this week
- Forsyth & Ponce textbook, chapter 7
- Intelligent Scissors
  - http://www.cs.washington.edu/education/courses/576/03sp/readings/mort-sigg95.pdf

Every picture tells a story

Goal of computer vision is to write computer programs that can interpret images
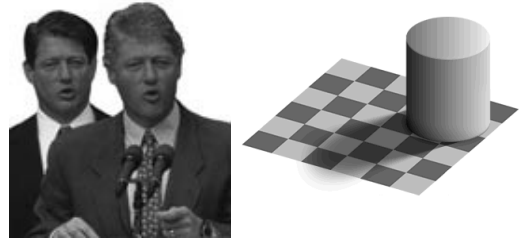
Can computers match human perception?

Not yet
- computer vision is still no match for human perception
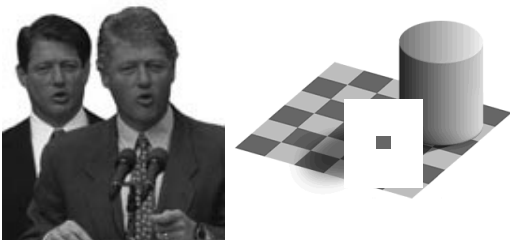- but catching up, particularly in certain areas

Perception

Perception

Perception

Low level processing

La Gare Montparnasse, 1895

Low level operations
- Image enhancement, feature detection, region segmentation

Mid level processing

Mid level operations
- 3D shape reconstruction, motion estimation

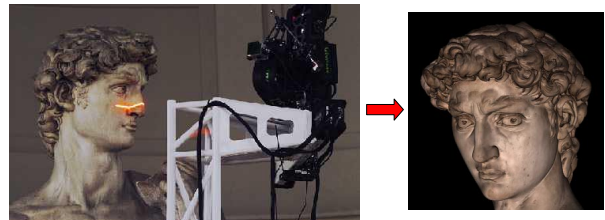## High level processing

High level operations
- Recognition of people, places, events

Application: Document Analysis

Digit recognition, AT&T labs
http://www.research.att.com/~yann/

Applications: 3D Scanning

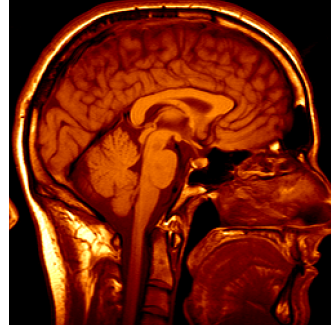Scanning Michelangelo's *"The David"*
- The Digital Michelangelo Project
  - http://graphics.stanford.edu/projects/mich/
- UW Prof. Brian Curless, collaborator
- 2 BILLION polygons, accuracy to .29mm

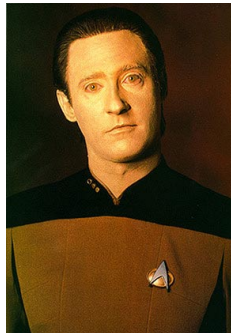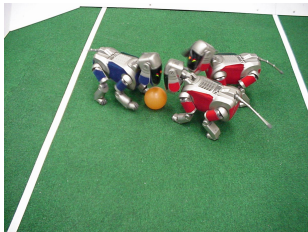## Applications: Motion Capture, Games

Application: Medical Imaging
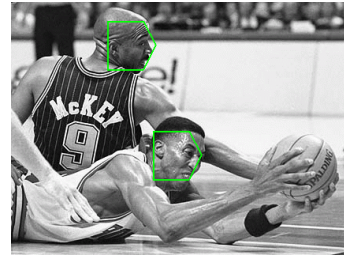

Applications: Robotics

Project 1: Intelligent Scissors

Project 2: Panorama Stitching

http://www.cs.washington.edu/homes/allen/cse590ss/fridge-big.html

Project 3: Face Recognition

Project 4

Open-ended research project

Class Webpage

http://www.cs.washington.edu/education/courses/cse455/03wi/

Grading

Programming Projects
- image scissors
- panoramas
- face recognition
- final project

one or two written homeworks

no final

General Comments

Prerequisites—*these are essential*!
- Data structures
- A good working knowledge of C and C++ programming
- Linear algebra
- Vector calculus

Course does not assume prior imaging experience
- computer vision, image processing, graphics, etc.

Emphasis on programming projects!