Computer Vision (CSE 455)

Staff
- Prof: Steve Seitz (seitz@cs)
- TAs: Dan Goldman (dgoldman@cs), Terri Moore (tamoore@cs)

Web Page
- http://www.cs.washington.edu/education/courses/cse455/04wi/

Handouts
- course info
- signup sheet
- questionnaire

Today

Overview of Computer Vision
Overview of Course
Image Filtering

Readings for this week (both in **reader**)
- Forsyth & Ponce, chapters 8.1-8.2
- Intelligent Scissors

Every picture tells a story

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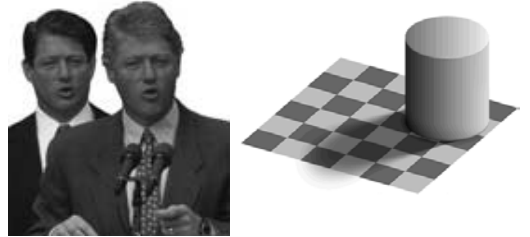
Can computers match human perception?

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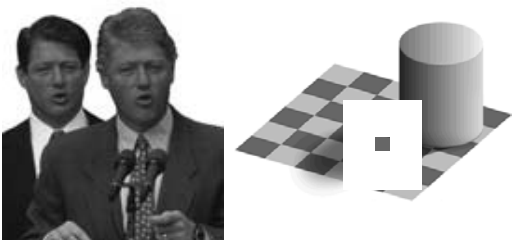- but catching up, particularly in certain areas

Perception

Perception

Perception

Low level processing

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

Mid level processing

Mid level operations
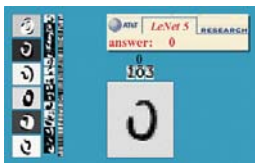- 3D shape reconstruction, motion estimation
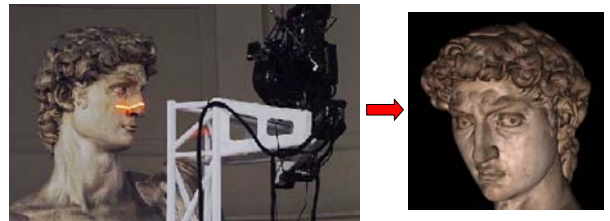
High level processing

High level operations
- Recognition of people, places, events

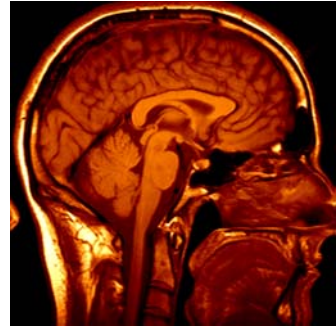## Application: Document Analysis

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/education/courses/455/03wi/projects/project2/artifacts/crosetti/index.shtml

Project 3: 3D Shape Reconstruction

Project 4: Face Recognition

Class Webpage

http://www.cs.washington.edu/education/courses/cse455/04wi/

Grading

Programming Projects (70%)
  • image scissors
  • panoramas
  • 3D shape modeling
  • face recognition

Midterm (15%)

Final (15%)

General Comments

Prerequisites—*these are essential*!
  • Data structures (CSE 326)
  • A good working knowledge of C and C++ programming
      – (or willingness/time to pick it up quickly!)
  • Linear algebra
  • Vector calculus

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

Emphasis on programming projects!