Announcements

- **Today (Tuesday)**
  - Special project advising session (4-6pm)
  - Please sign up for a slot

- **Quiz 8 due by Thursday class time**

- **Thursday class (by TA)**
  - Show cool examples from assignments
  - Hear each project group’s progress
  - Project advising
  - Your presence count!
Final Project Presentation

- Monday Dec. 13
- 10:30am room CS 142
- A PC machine will be provided
  - Intel Core i7 processor, NVIDIA GPU
  - If you want to demonstrate your project on the provided PC, please come to my office by 10:00am that morning, to make sure it runs correctly on my computer
  - You are welcome to use your own laptop/machines
Final Project

1. Every group has up to 10 minutes to present and demonstrate their project
   - Describe what you have done (~3 min)
   - Explain technical details (~ 3 min)
   - Must show a working demo (~ 2 min)
   - Demonstrate cool features/results (~2 min)
   - Lessons you’ve learned
   - Be concise.
   - Be prepared for questions.
Final Project

☐ 2. You must give me a digital copy of your code by the end of the presentation.

☐ 3. Please email a 1-2 page report by the end of Wed Dec 15th, documenting:
   - A description of your project
   - Technical details
   - Features you implemented
   - The contribution of each group member
   - Screen shots (at least 1)
   - Lessons you have learned
The grading of the final project

- We will consider the following elements:
  - Completeness of project
  - Technical strength/difficulty
  - Amount of work
  - Novelty
  - User interface
  - Project presentation
  - Thursday in-class progress report
CMPSCI 473: Introduction to Computer Graphics (Fall 2010)

Lecture 21: 3D Scanning and Printing

Rui Wang
What is Physical Computing?

- Sensing and responding the physical world with computers.
- Increasingly, computation is not all about designing algorithms, it is also about the ways we interact and communicate with computers.
What is Physical Computing?

- Examples:
  - Use camera to acquire texture
  - Use 3D scanner to acquire object geometry
    - Real → Digital
  - Use 3D printer to manufacture objects
    - Digital → Real
  - Use sensors and microcontrollers to translate analog input to a software system
  - Control electro-mechanical devices using servos, lighting, or other hardware.
3D Scanning

- 3D Scanner
Stereopsis

- Disparity

This works for objects with rich textures where it’s easy to identify feature correspondences.

What about non-texture objects?
Stereopsis

- We can use laser projector to cast feature points onto objects.
- The laser projector also serves as a virtual camera, so it can be combined with an additional camera to scan 3D object.
- One scan can only capture a part of the object
  - Use multiple scans

- Demo

- Microsoft Kinect
3D Printing

- 3D Printer!
3D Printing

- Extremely useful for prototyping.
- Print robotics parts, custom project boxes, make physical replicas.
- 3D scanning → digital modification → 3D printing
- 3D printing devices are becoming more and more economic.

- The democracy of manufacturing.