CPSC 314
Computer Graphics

Dinesh K. Pai

Lecture 1: Introduction

Course website:

http://www.ugrad.cs.ubc.ca/~cs314/Vjan2014/

People

- Instructor: Dinesh K. Pai, pai@cs.ubc.ca Office X853. Office hours TBD.

- TAs: Russell Gillette, Jan-Hendrik Louw, Craig Peters. Plus Edwin Chen (CSSEI TA).

- For fastest response to general course-related questions, use the discussion board.
  - You can also meet with TAs during scheduled lab times.
  - The instructor is also available by appointment for questions not suitable for the discussion board
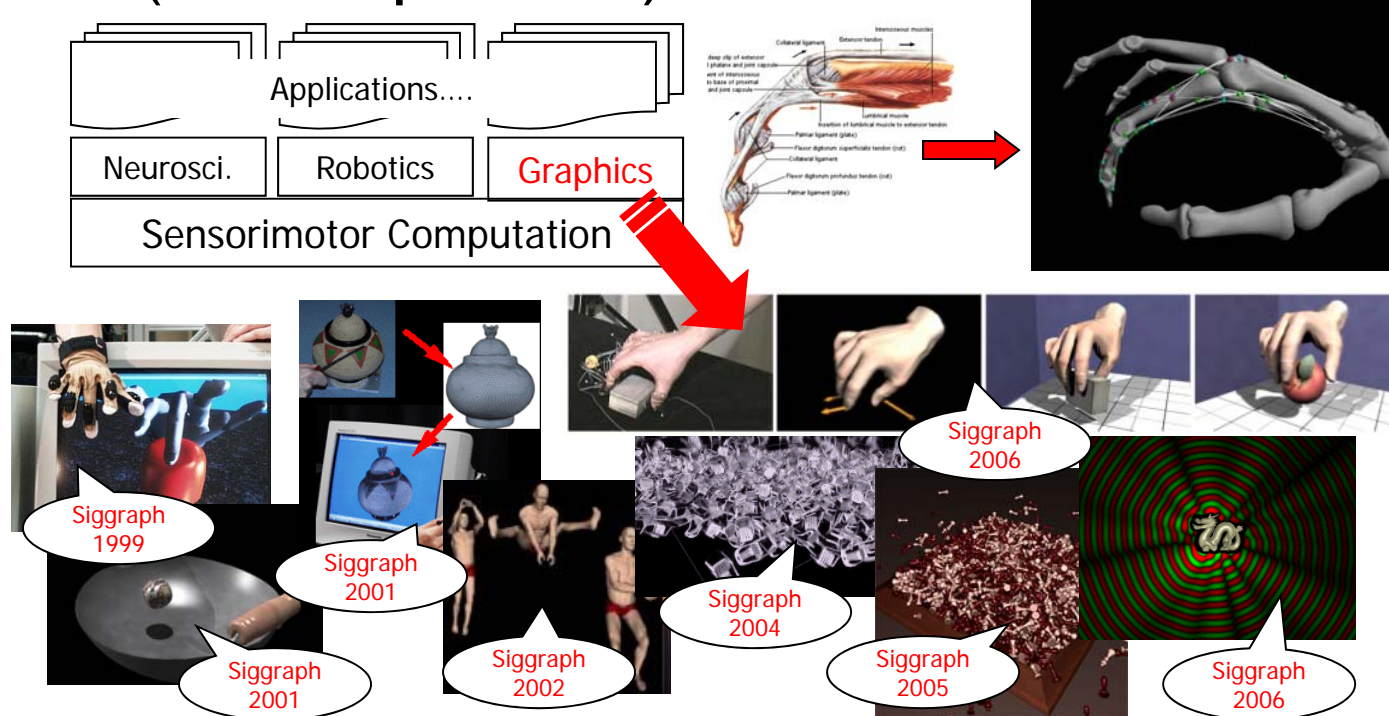
About me…

- **Professor and Canada Research Chair**
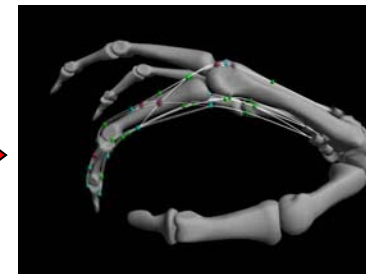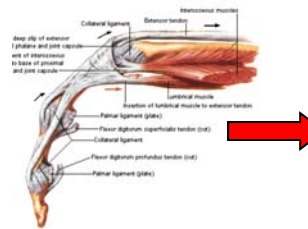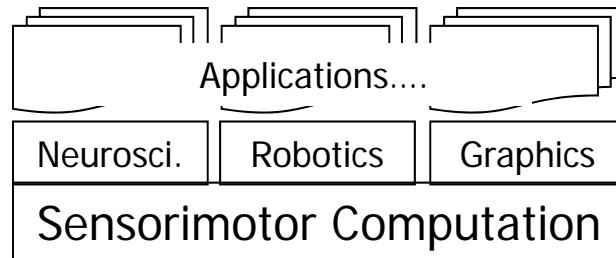
# Sensorimotor Computation in Graphics

- (2000s-present)

Course Communication

- Lectures: MWF 1-2pm Dempster 301

- Labs: In ICICS 005. Labs start next week. Attendance is not mandatory but highly recommended.

- Course website: Assignments and materials will be posted here http://www.ugrad.cs.ubc.ca/~cs314/Vjan2014

- Discussions: We will use Piazza. Please join the course discussion group: https://piazza.com/ubc.ca/spring2014/cpsc314.

Required Textbook

- Textbook: Steven J. Gortler (2012) Foundations of 3D Computer Graphics, MIT Press

- Available online from UBC library, free to UBC students.
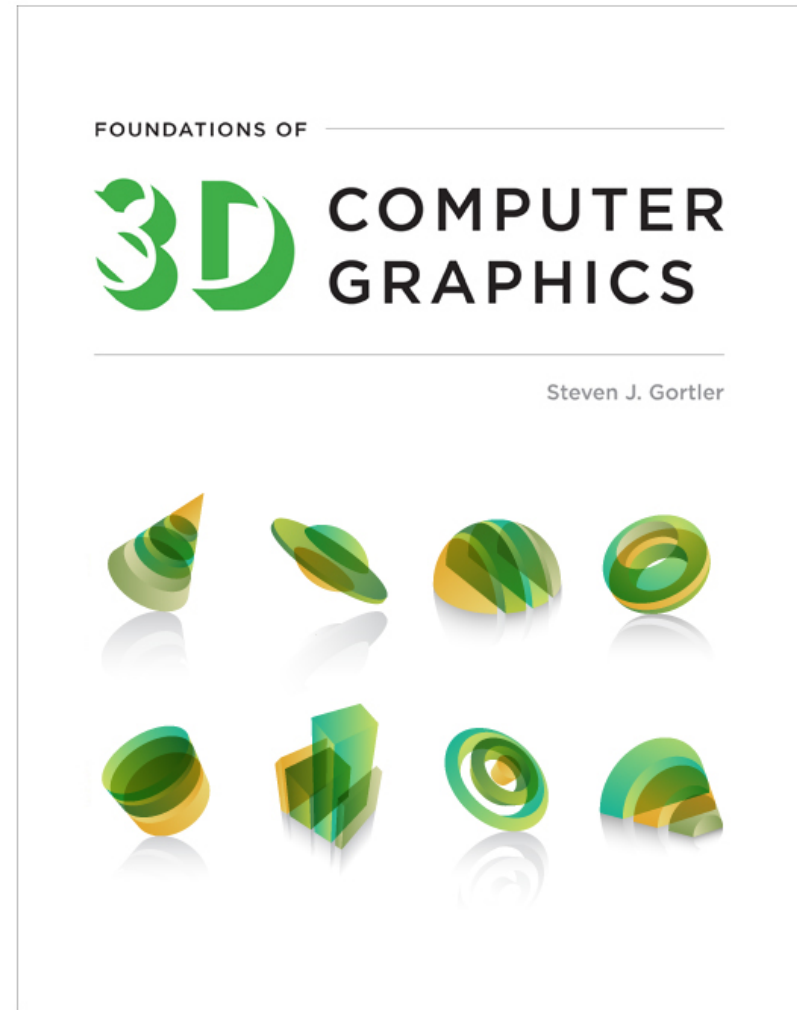
Prerequisites

- All of MATH 200, MATH 221 and either
  (a) CPSC 221 or
  (b) all of CPSC 260, EECE 320. .

- The following are essential for success

  - good grasp of linear algebra

  - exposure to calculus; "mathematical maturity"

  - programming experience in C++

- This is not an easy course!

Grading

marks %	work
40	programming assignments (4)
26	final exam
24	midterms (2)
10	concept consolidation w clickers

First assignment will be available next week

C³
(Concept Consolidation with Clickers)

- Clickers are required. Please obtain one, register with Connect, and bring to next class.

- Each gets one participation mark + 0-3 marks for right answer

- Four types of questions:
  - Survey (1) : A simple poll, no "correct" answer.
  - Review (2) : material covered in class or reading.
  - Exercise (3) : In-class exercises, taking 5-10mins.
  - Homework (4) : A homework problem, with most of the work done outside class.
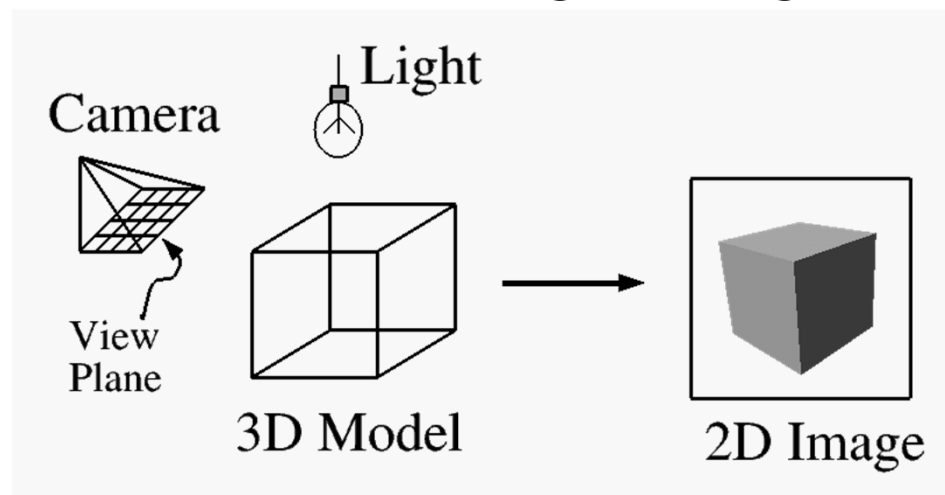
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Computer Graphics

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What is Computer Graphics?

Many slides courtesy of Min Hyuk Kim, KAIST

What is Computer Graphics?

- **Imaging** = representing 2D images
- **Modeling** = representing 3D objects
- **Rendering** = constructing 2D images from 3D models
- **Animation** = simulating changes over time

Examples of Computer Graphics

See slides 3-6 of
http://vclab.kaist.ac.kr/cs492b/day01-hello.pdf

Thin Skin Elastodynamics

Duo Li, Shinjiro Sueda[*], Debanga R. Neog, and Dinesh K. Pai
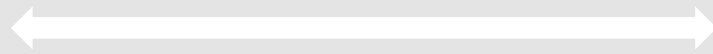
University of British Columbia
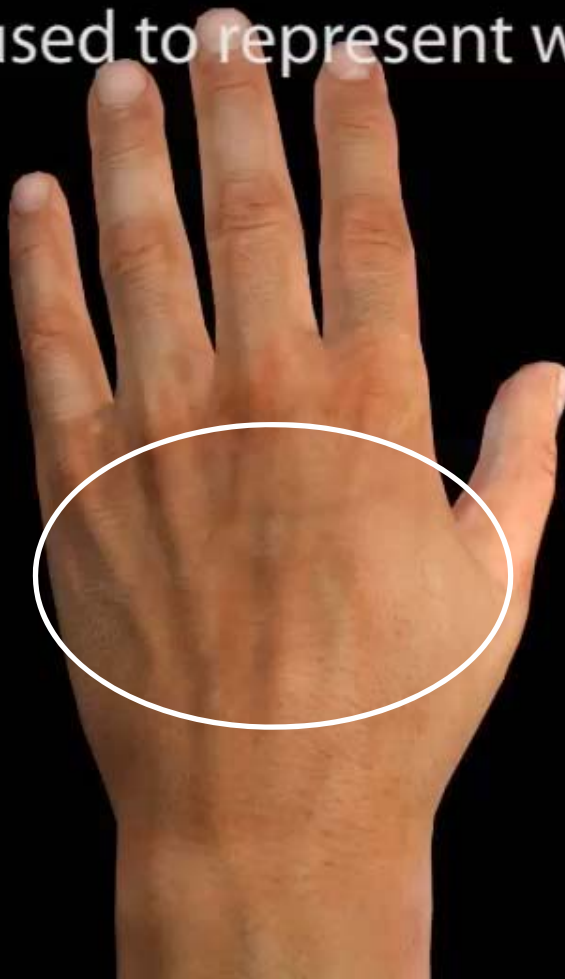
[*]Now at Disney Research Boston / MIT

Human Head Movements

Normal map is used to represent wrinkles and veins
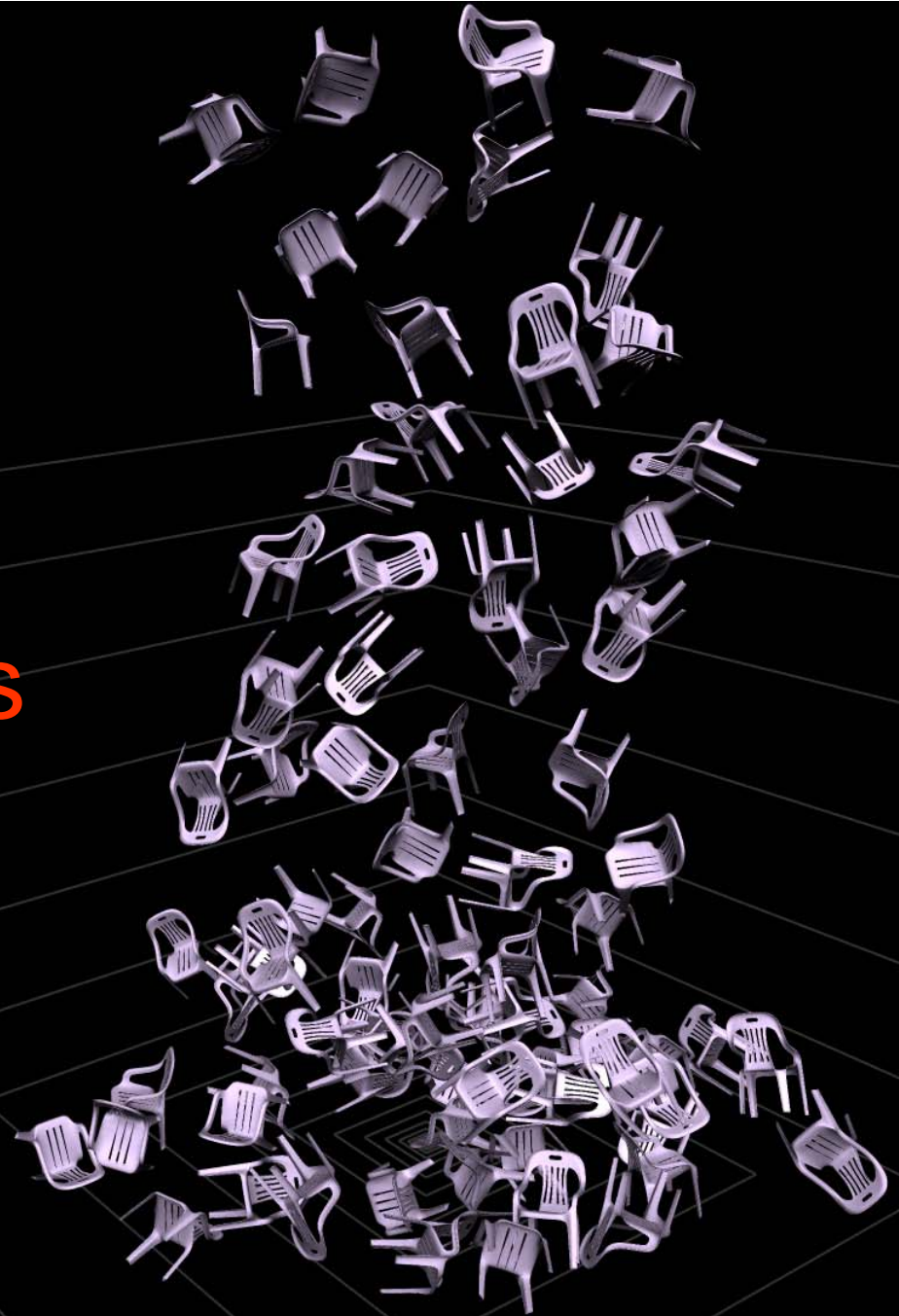
Note: mesh vertices do not move

BD-Tree

Output-Sensitive
Collision Detection
for Reduced
Deformable Models

Doug L. James

Dinesh K. Pai

SIGGRAPH 2004

Output-Sensitive Collision Processing for Reduced-Coordinate Deformable Models

In this course you will learn how to

- Represent 3D shapes

- Transform 3D shapes

- Synthesize 2D images from 3D shapes

- Model shading and lighting

- Model details of appearance using textures

- Program all of the above using the OpenGL API and OpenGL Shading Language

For next class

- Bring your clicker

- Review Chapter 1 of textbook

- Review Math 200 and Math 221.. We'll start off by reviewing some essential mathematics for 3D graphics