CS475/CS675 - Computer Graphics

Introduction
Introductions

• **Instructor**
  Parag Chaudhuri
  SIA-304, Kanwal Rekhi Building
  Office hours: Fix by email, Mention [CS475]/[CS675] in the subject line

• **TA**
  - Pratik Kalshetti, Ph.D., CSE
  - Sukanya Bhattacharjee, Ph.D., CSE
Introductions

• **Course Details**
  - Slot 12, Mon, Thu, 5:30pm-7:00pm
  - www.cse.iitb.ac.in/~paragc/teaching/2019/cs475
  - Mailing list (CS475): cs475@cse.iitb.ac.in
  - Mailing list (CS675): cs675@cse.iitb.ac.in
  - Classroom: SIC-301

• **Eligibility**
  - Data Structures, Linear Algebra
  - **No** Audits
What is Computer Graphics?
Ernest and Celestine, Les Armateures, 2013
The Jungle Book, Disney, 2016
Scientific Visualization

Chanadrayaan, ISRO

Fiatlux Imaging
Digital and Print Media

Computational Photography

A Agarwala, M Dontcheva, M Agrawala, S Drucker, A Colburn, B Curless, D Salesin, M Cohen:

Desktop Publishing

Networked Media

Flash, Silverlight
IE, Firefox, Safari, Opera
YouTube, Flickr, Facebook
Graphical User Interfaces

Unity/Ubuntu  
Metro/Windows 10  
Aqua/Mac OSX 10.10

Now  
Wacom Cintiq  
Apple iPhone  
Fraunhofer FIT

The Future?

Microsoft Surface Hub  
Ivan Sutherland’s Sketchpad  
© Twentieth Century Fox

1962  
CS475/CS675 - Lecture 0
And the list goes on...

- Virtual Worlds – Google Earth, Second Life, Minecraft
- Algorithm Animation
- Typesetting and font design – LaTeX, Freetype
- Digital Video and HDTV
- Drug Design
- Image and Video Search
  ...

CS475/CS675 - Lecture 0
What is Computer Graphics?

• CG is the *art* and *science* of using the computer to make images.

• Study of methods (artistic, mathematical, algorithmic, software) and systems (mechanical, electronic, hardware) to create, control and manipulate pictorial data on the computer.
What is Computer Graphics?

• Forget the definitions!

• Remember why you are here.
What will we learn in the course?

Tentative course content
Drawing in 2D and 3D

Colouring Pixels
Modelling

- Lines, Polygons
- Curves, Surfaces
- Modelling transformations
- Hidden Surfaces
- Viewing transformations
Rendering

- Shading
- Lighting models
- Texture mapping
- Ray Tracing
Animation

• Transformations
• Interpolation

Luxo Jr., PIXAR, 1986

Neha and Monica, CS675, 2010

Chirag Sethi and Achin Bansal, CS 475, 2009

Darshan Kapashi and Shivam Agarwal, CS475, 2011

Atul Rokade, CS675, 2012
Course Structure

- Lectures, notes, textbook – see course webpage
- Make sure you are subscribed to the mailing lists.
- Programming Assignments – big ones.
- Announced Quizzes (Sep 4, Oct 23), Unannounced Quiz
- MidSem Exam (Sep 16 – 20)
- EndSem Exam (Nov 11 - 22)
Evaluation

Everything is checked for plagiarism

- Cite sources if you borrow (even if from your classmates/seniors).
- Both parties get the same penalty.
- At best, you will fail the course.
Grading

• Active Class Participation – 10%.
• Assignments, Demos, Vivas – 50-60%.
• Exams and Quizzes – 30-40%.
• Very low attendance – DX grade.
• If you plan to drop after the add/drop date – tell me.
Unsought Advice

- Attend classes – just the slides and book will not be sufficient.
- Do the assignments – plan early, don't ask for extensions.
- If you do not understand something – ASK! Ask early, ask often.
- If what I am teaching seems irrelevant – ask why it is being taught.
- If you think I am teaching something incorrect – point it out.
  - If you do it often enough – correctly – you get a bonus!
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Yay!

Let's begin!

Up! © Disney/PIXAR 2009
Look At the OpenGL Tutorials

- Go through, download, run tutorials 0 and 1

https://github.com/paragchaudhuri/cs475-tutorials