



# **CS475M**

# **Computer Graphics Minor**

## **Introduction**

# Introductions

- **Instructor**

Parag Chaudhuri

SIA-304, Kanwal Rekhi Building

Office hours: after class, or fix by email

- **TA**

Jash Dave, M.Tech.2 CSE

# Introductions

- **Course Details**

Slot 5, Wed, Fri, 9:30am-11:00am

[www.cse.iitb.ac.in/~paragc/teaching/2016/cs475m](http://www.cse.iitb.ac.in/~paragc/teaching/2016/cs475m)

Mailing list: Moodle

Classroom: SIC-301

- **Eligibility**

Non-CSE, B.Tech. & Dual who have cleared CS213m

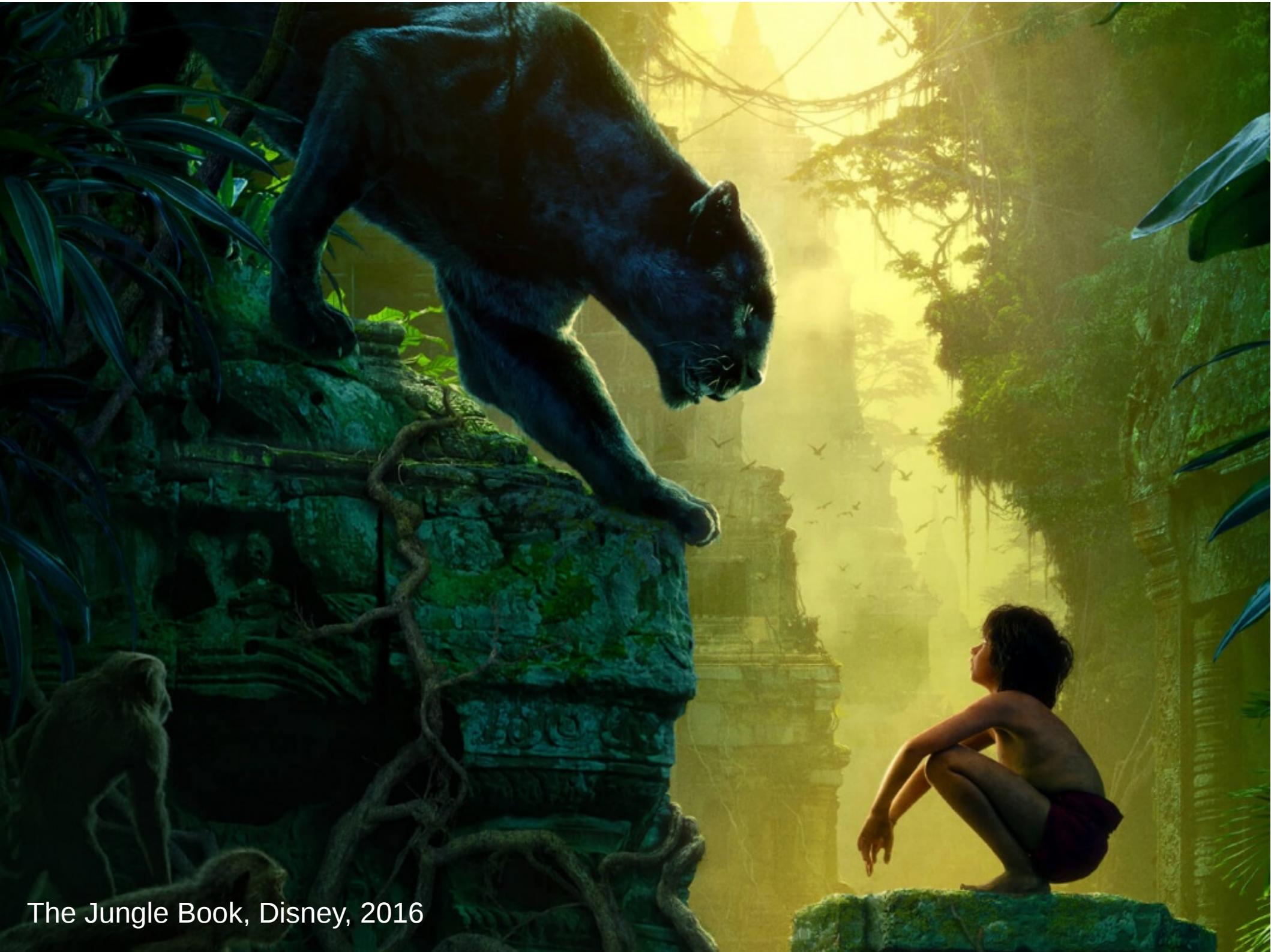
No Audits

# What is Computer Graphics?

?



Ernest and Celestine, Les Armateurs, 2013



The Jungle Book, Disney, 2016



The interface of Age of Empires III is shown at the bottom of the screen. On the left is a circular mini-map of the world, showing various regions and resources. Next to it is a portrait of a character. Below these are resource counts: Gold (32 / 40), Wood (2211), Stone (898), and Coal (699). The main central area is a command center for a Galleon unit, displaying its name and a small icon. To the right are sections for "Train" (listing units like Archers, Musketeers, and Sailors) and "Commands" (listing various military orders). The bottom right corner features the Ensemble Studios logo.

II: Colonial Age

Objectives

Navigation Charts Found: 2/3

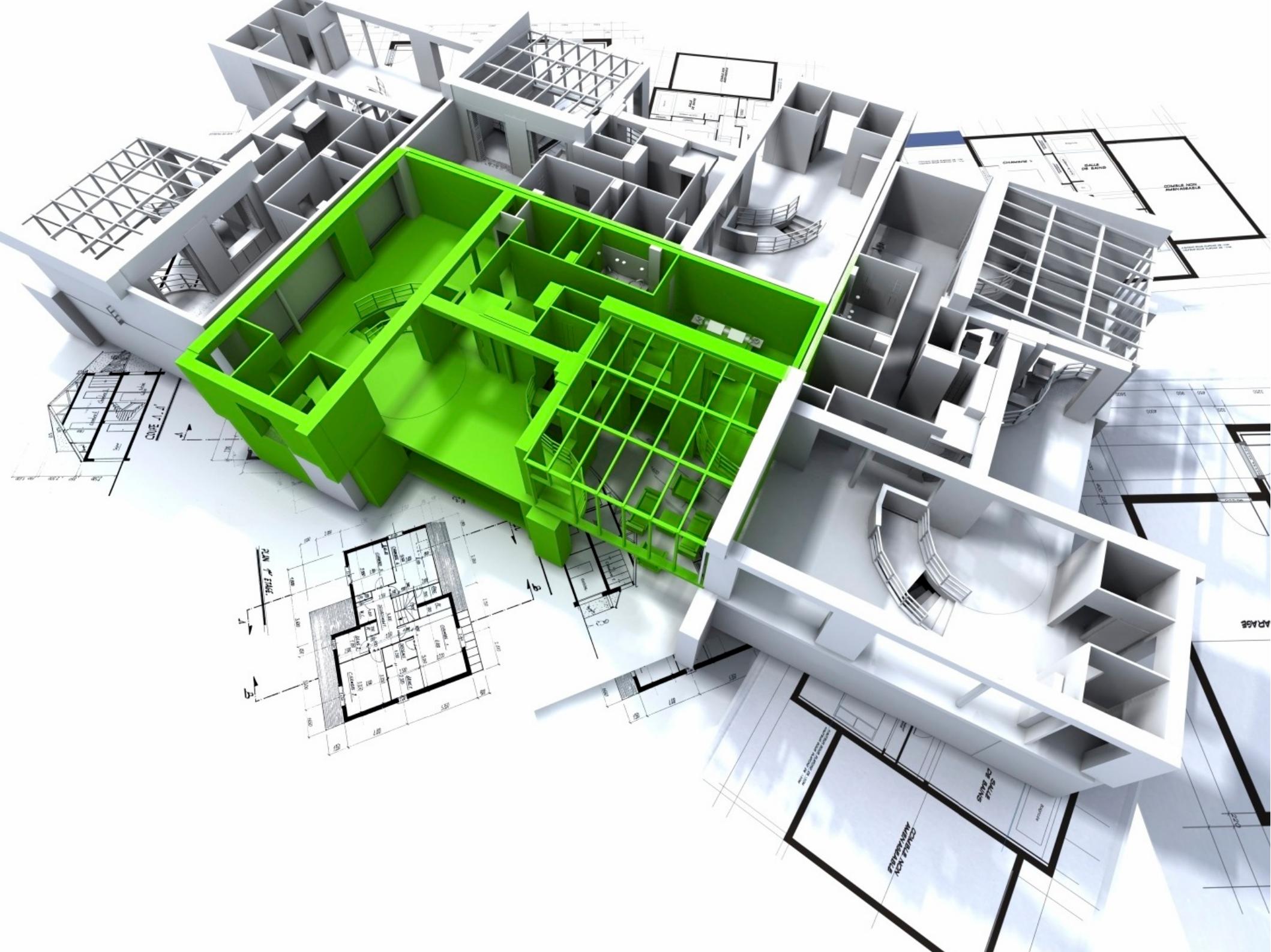
Train

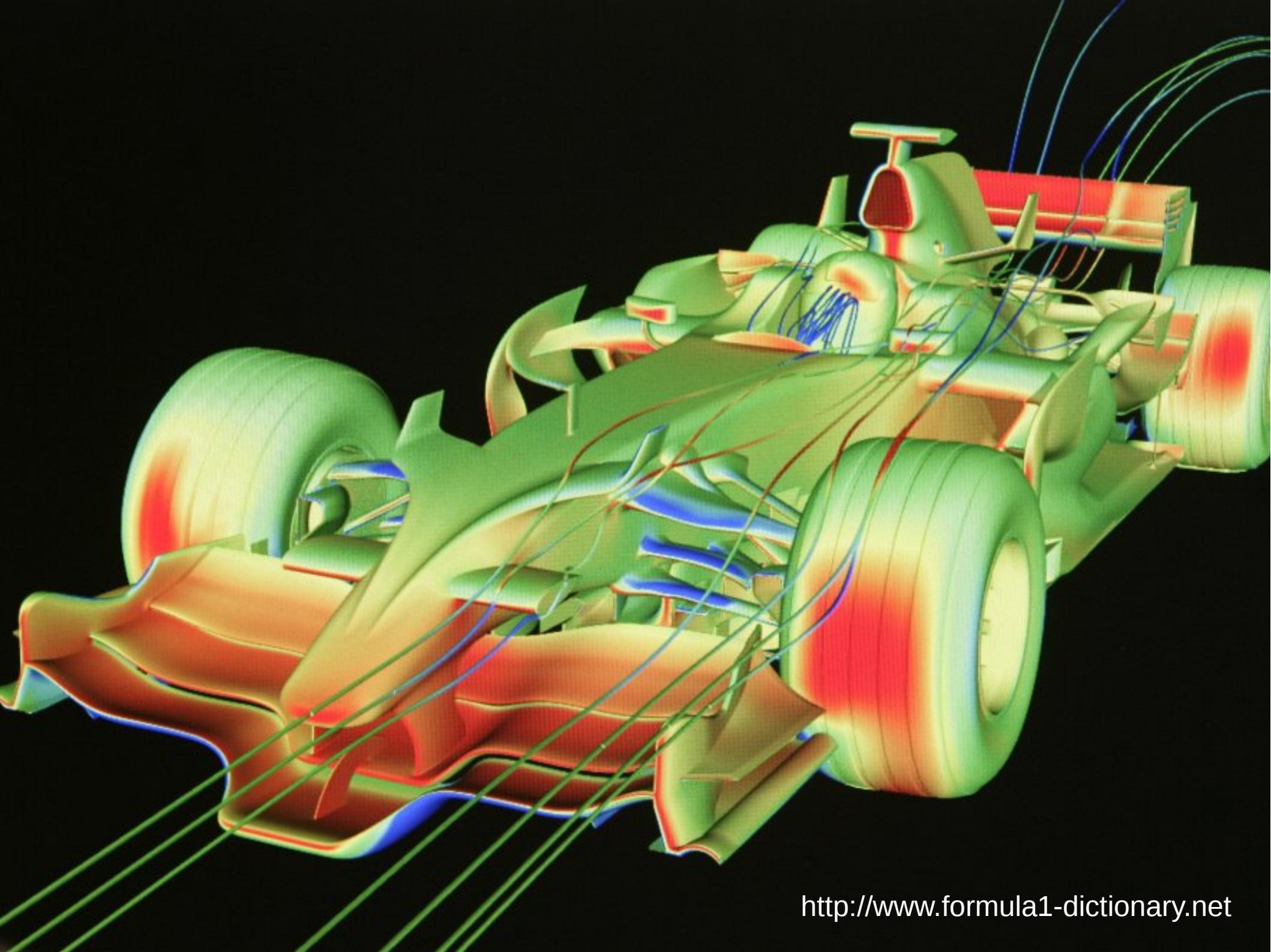
Galleon

Commands

Age of Empires 3, Ensemble Studios, 2005

Ensemble STUDIOS



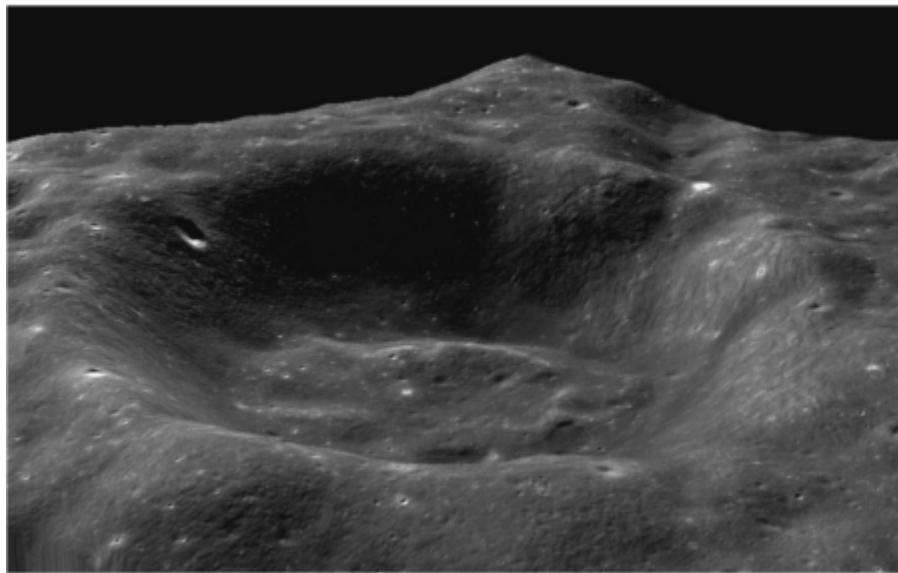


<http://www.formula1-dictionary.net>

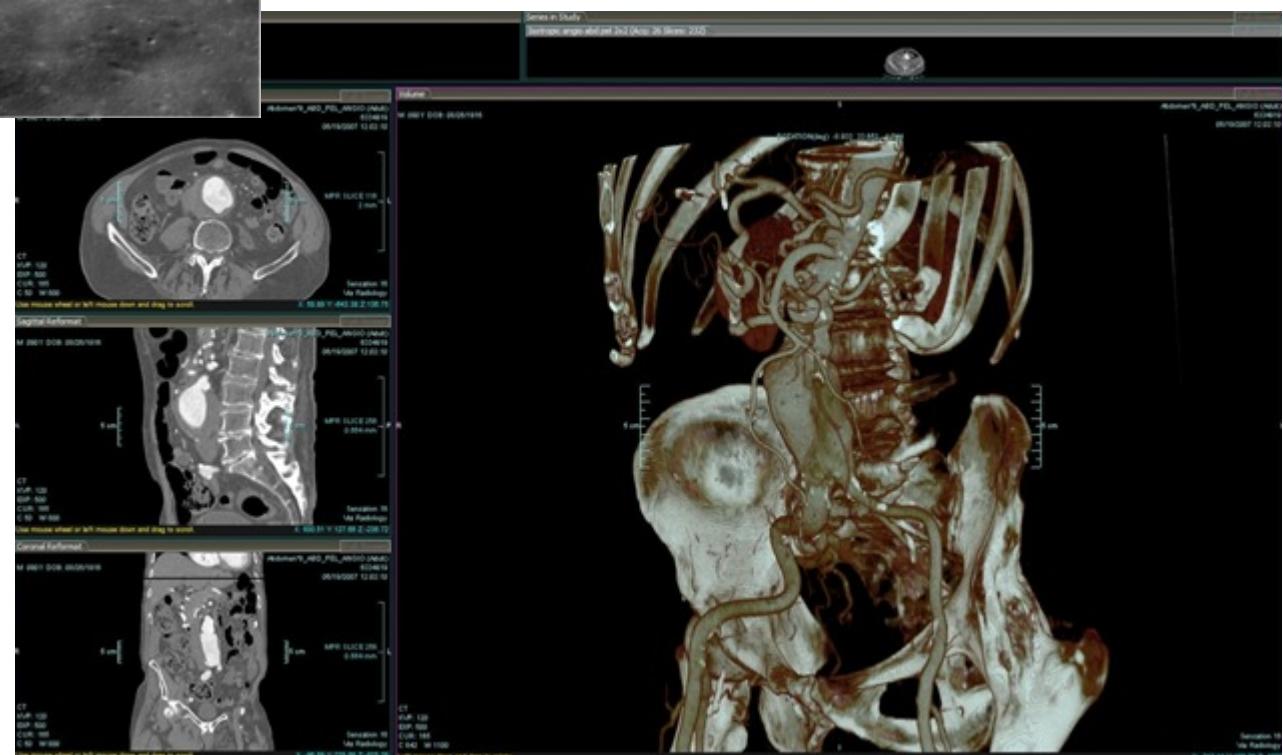


Microsoft Hololens

# Scientific Visualization



Chanadrayaan, ISRO



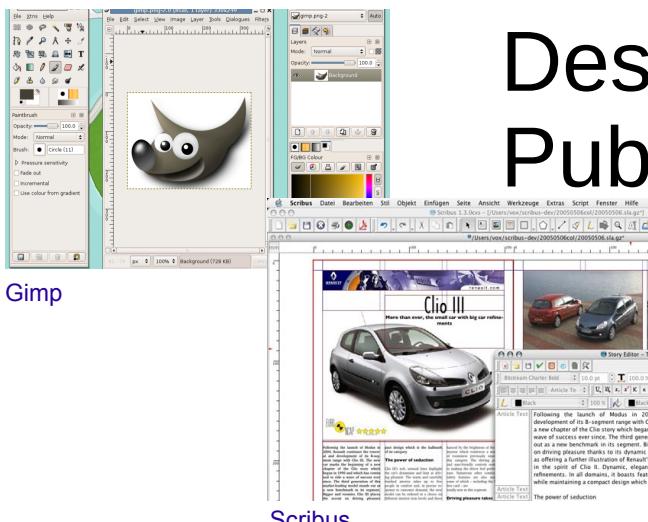
Fiatlux Imaging

# Digital and Print Media

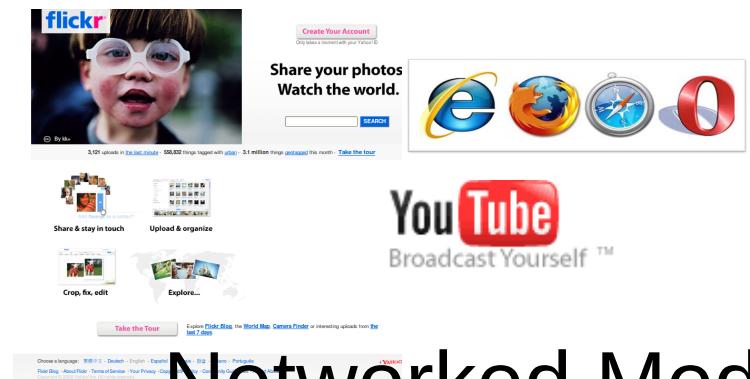


## Computational Photography

A Agarwala, M Dontcheva, M Agrawala, S Drucker, A Colburn, B Curless, D Salesin, M Cohen:  
Interactive Digital Photomontage. ACM Transactions on Graphics (Proceedings of SIGGRAPH 2004)



## Desktop Publishing



## Networked Media

Flash, Silverlight  
IE, Firefox, Safari, Opera  
YouTube, Flickr, Facebook

# Graphical User Interfaces

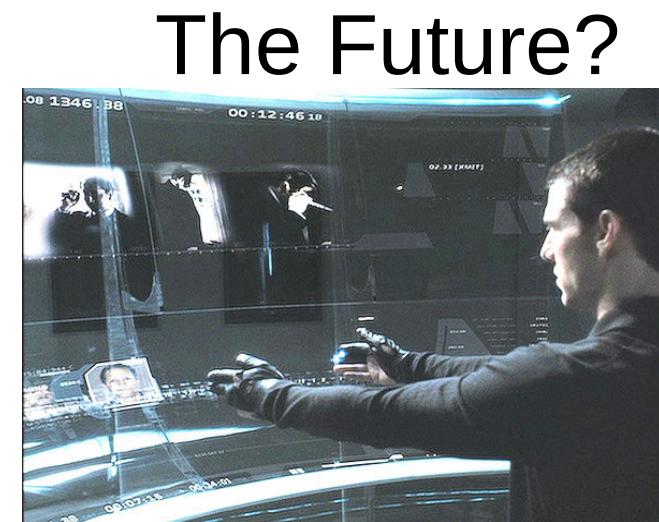


Unity/Ubuntu

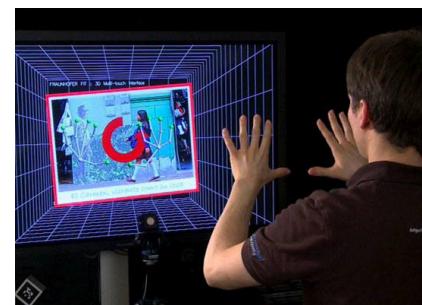


Metro/Windows 10

Aqua/Mac OS X 10.10



© Twentieth Century Fox



Microsoft Surface Hub



Wacom Cintiq

Now



Apple iPhone



Ivan Sutherland's Sketchpad

1962

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
- ...
- ..

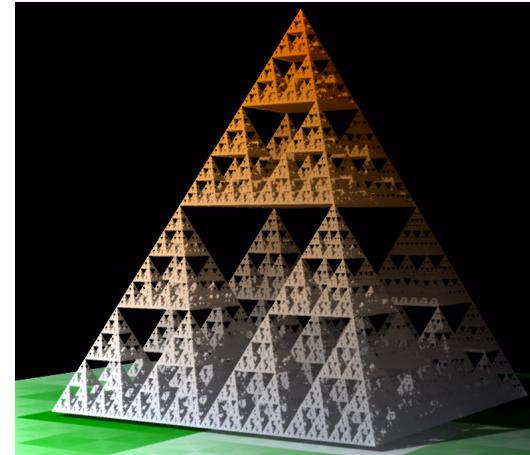
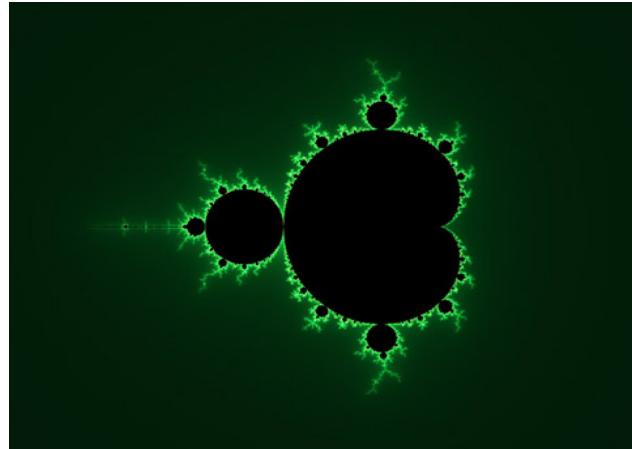
# What is Computer Graphics?

- 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 pictoral data on the computer.

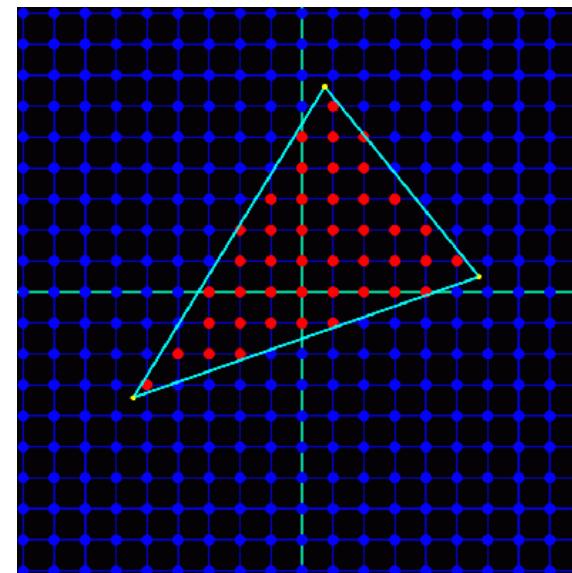


What will we learn in the course?  
Tentative course content

# Drawing in 2D and 3D

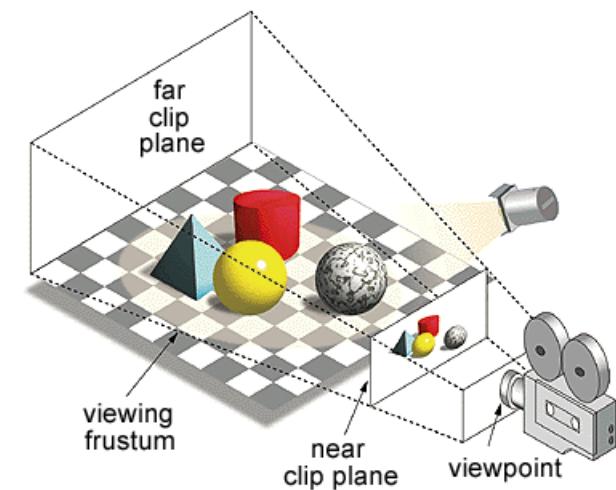
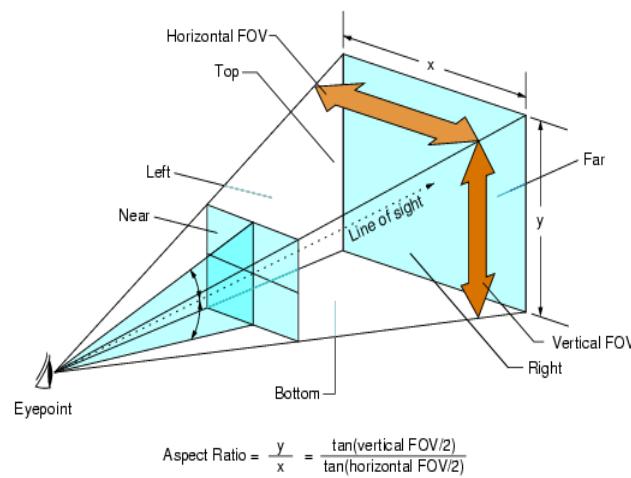
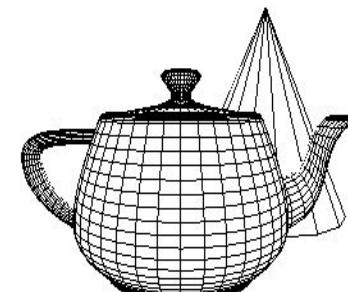
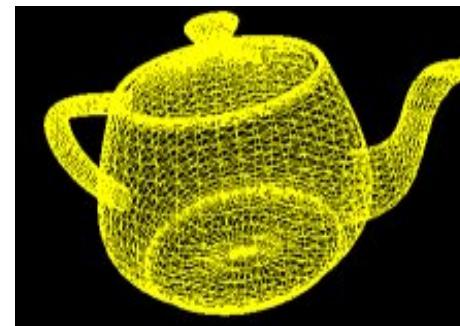


Colouring Pixels



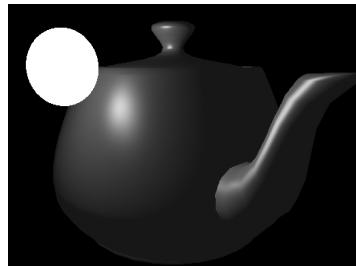
# Modeling

- Lines, Polygons
- Curves, Surfaces
- Modeling transformations
- Hidden Surfaces
- Viewing transformations



# Rendering

- Shading
- Lighting models
- Texture mapping
- Raytracing
- Non-photorealistic

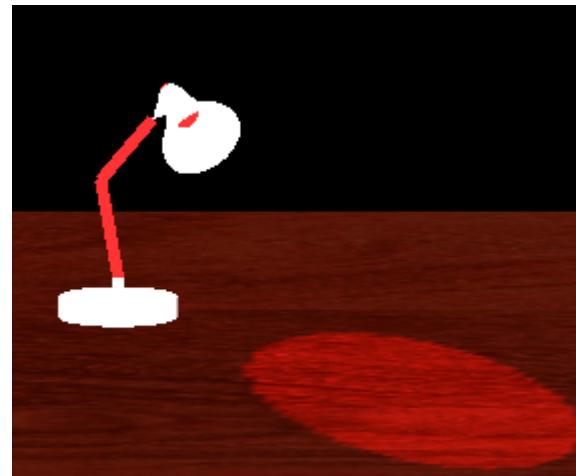


# Animation

- Transformations
- Interpolation
- Keyframing



Luxo Jr., PIXAR, 1986



Chirag Sethi and Achin Bansal, CS 475, 2009



Neha and Monica, CS675, 2010



Atul Rokade, CS675, 2012



Darshan Kapashi and Shivam Agarwal, CS475, 2011

# Course Structure

- Lectures, notes, textbook – see course webpage
- Make sure you are subscribed to the course on Moodle.
- Programming Assignments
- Announced Quizes (Aug , Oct), Unannounced Quiz
- MidSem(), EndSem()



Despicable Me,  
Illumination Entertainment 2010

# Evaluation

- Demos and viva
- **No** open book exams
- Assignments, Exam+quizzes, Class participation
- 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.

- Attendance: DX grade

# 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.

# Yay!



Let's begin!

Up! © Disney/PIXAR 2009