



CS475/CS675 Computer Graphics

Introduction

Introductions

- **Instructor**

Parag Chaudhuri

SIA-304, Kanwal Rekhi Building

Office hours: Fix by email

- **TA**

- Pratik Kalshetti, M.Tech. 2, CSE
- Naman Rastogi, M.Tech. 2, CSE

Introductions

- **Course Details**
 - Slot 8, Mon, Thu, 2:00pm-3:30pm
 - www.cse.iitb.ac.in/~paragc/teaching/2017/cs475
 - Mailing list (CS475): cs475@cse.iitb.ac.in
 - Mailing list (CS675): cs675@cse.iitb.ac.in
 -
 - Classroom: SIG-301
- **Eligibility**
 - Data Structures, Linear Algebra
 - **No Audits**

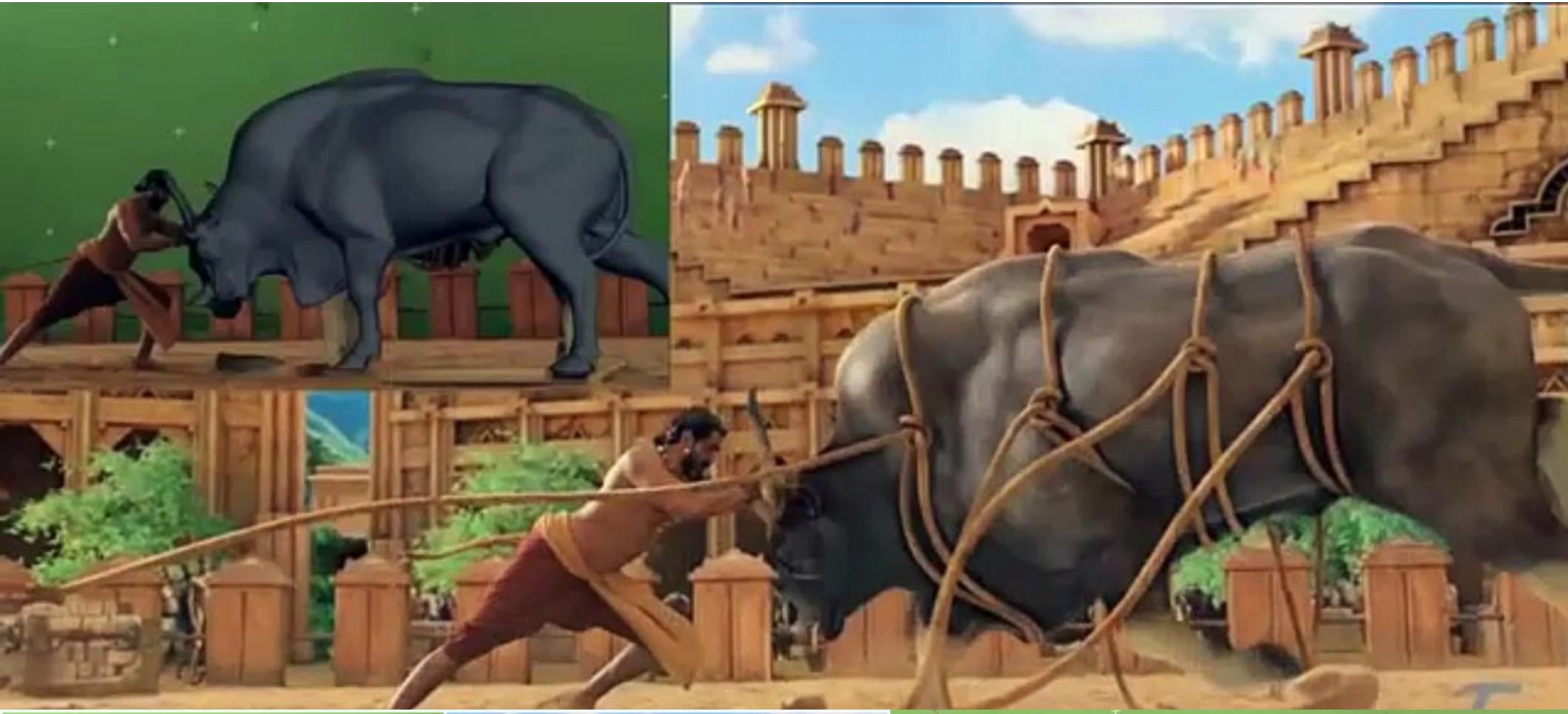


What is Computer Graphics?

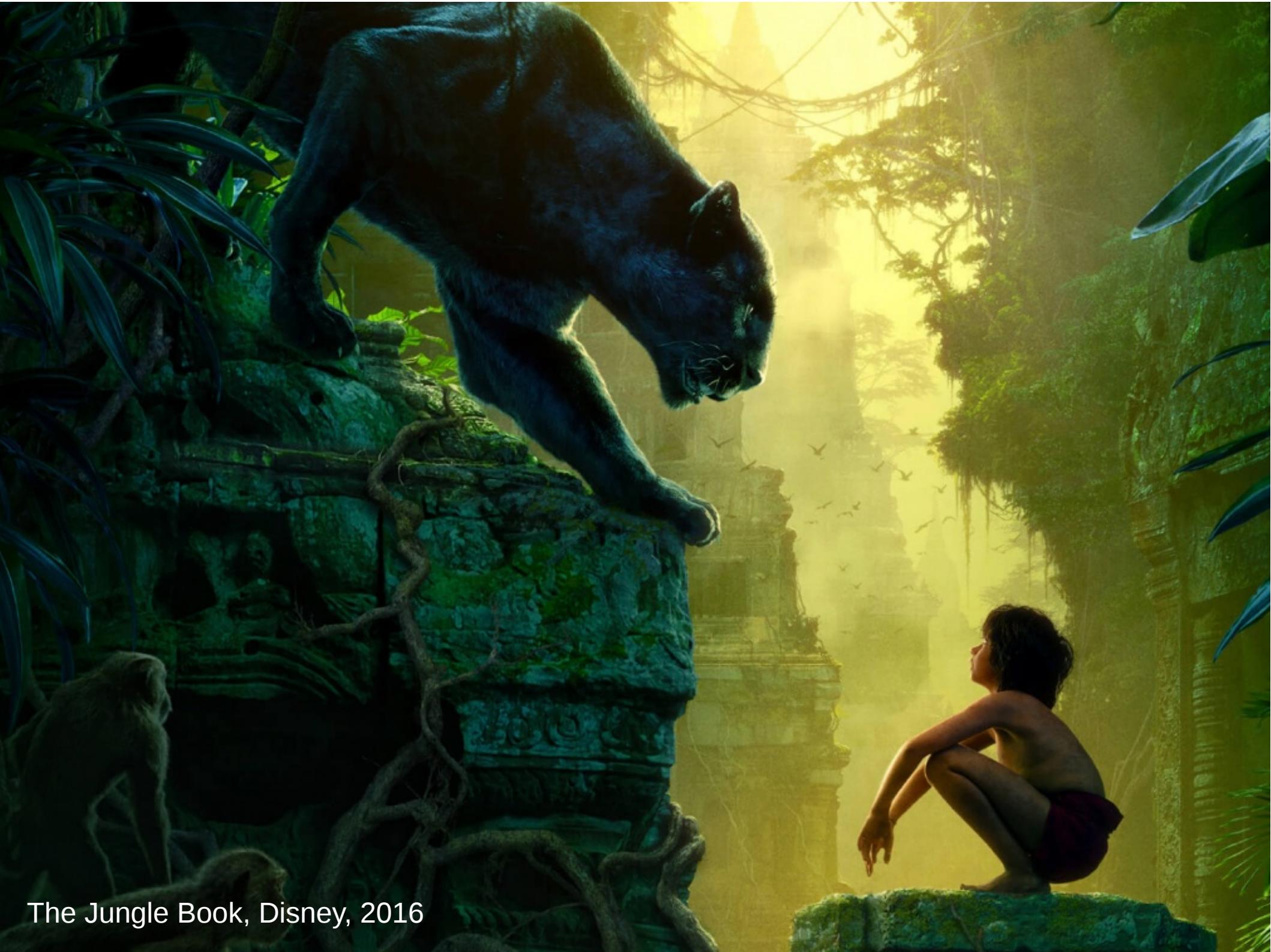
?



Ernest and Celestine, Les Armateurs, 2013



Bahubali 2, Arka Mediaworks and Tau Films, 2015



The Jungle Book, Disney, 2016



Age of Empires 3, Ensemble Studios, 2005

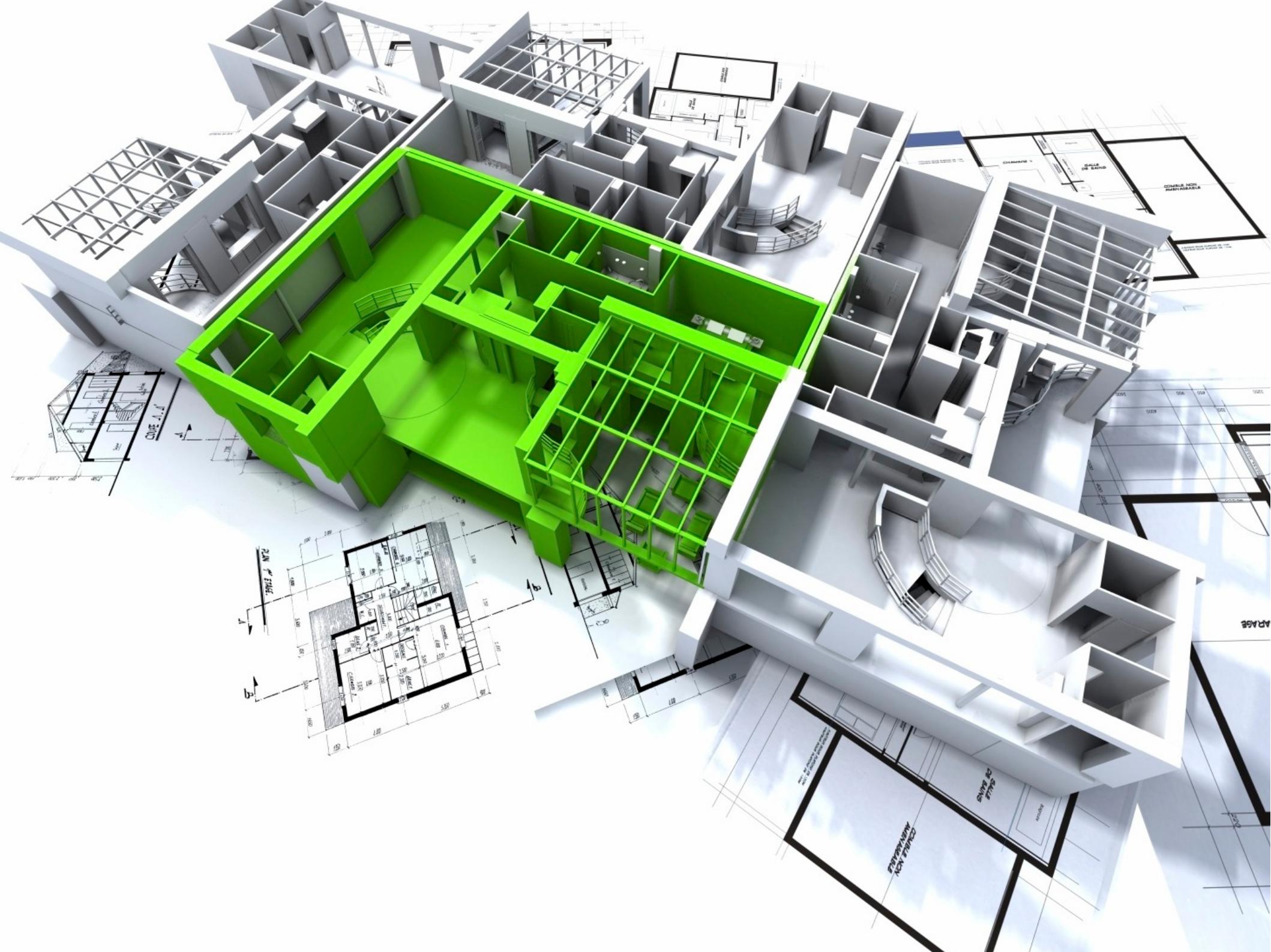
Train

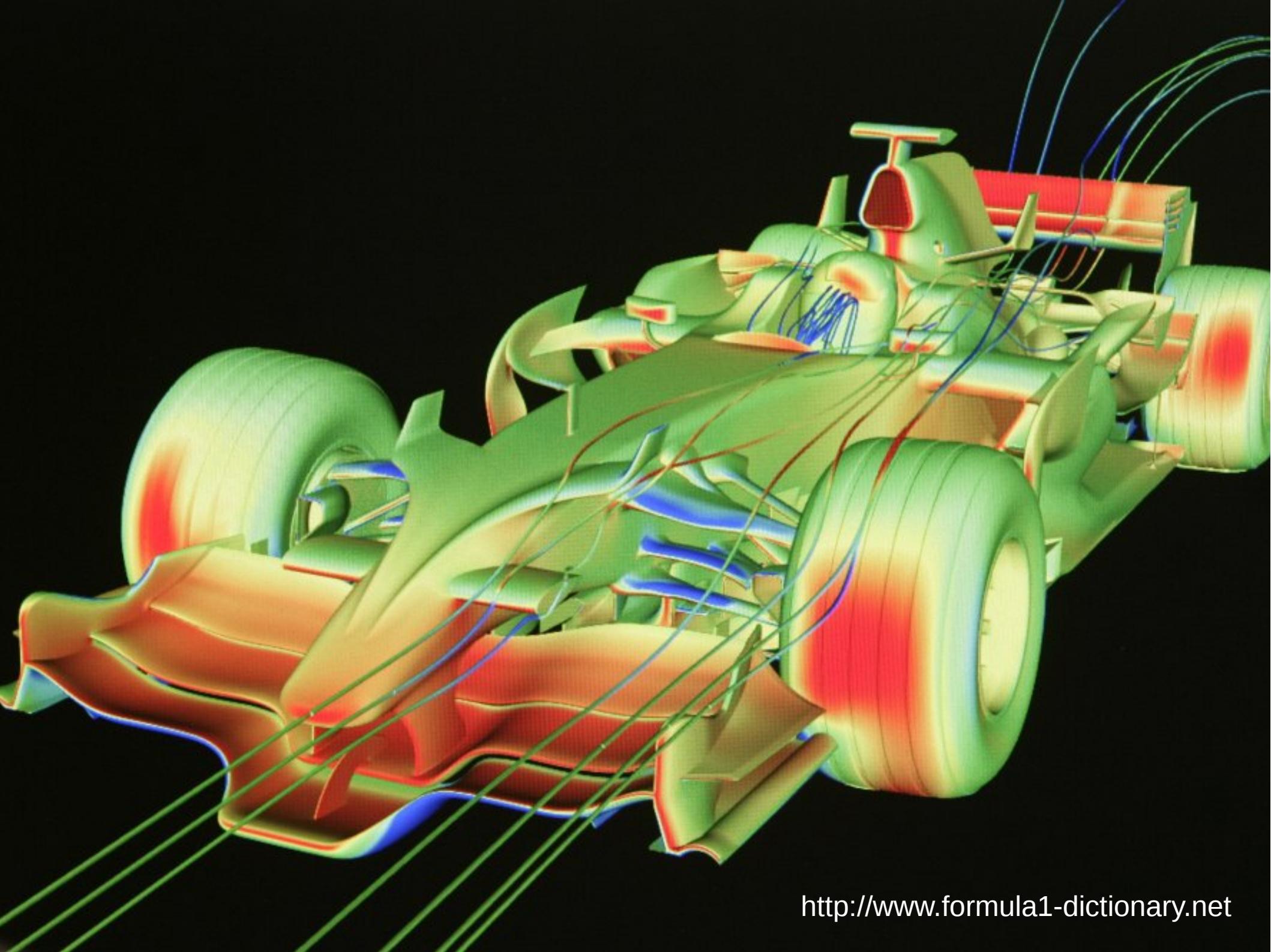
Commands

AGE OF EMPIRES III
ENSEMBLE STUDIOS

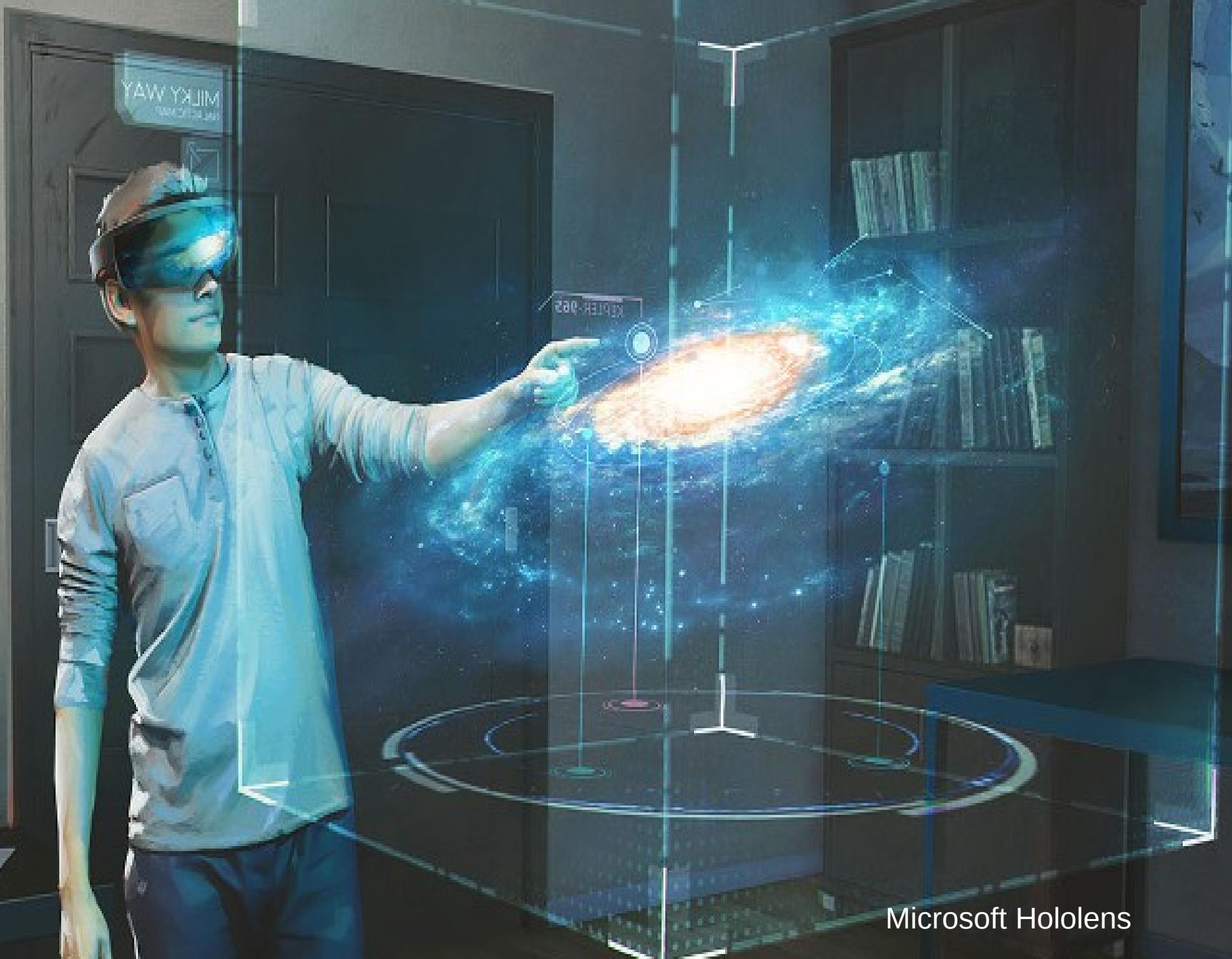
Fri Oct 14 01:34:25 2005

Food	32 / 40
Gold	2211
Wood	898
Stone	699



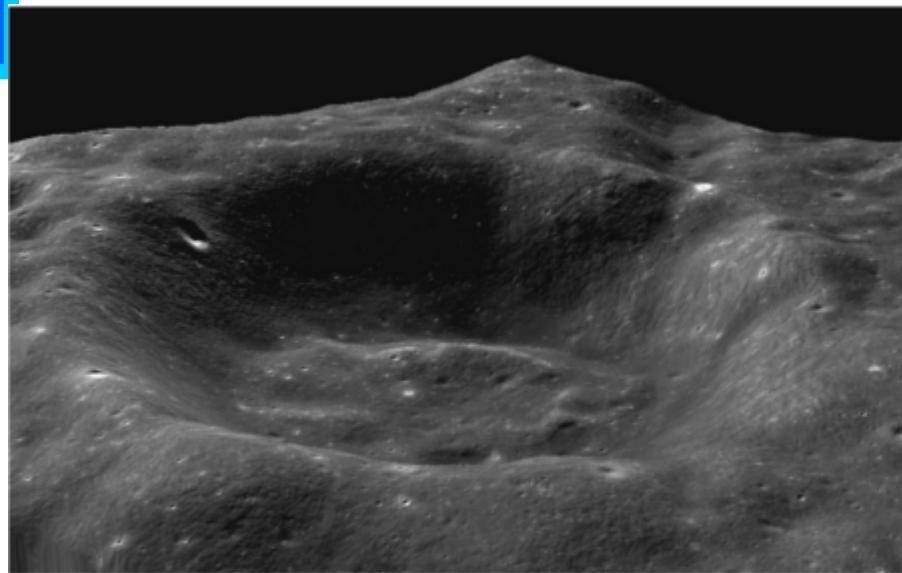


<http://www.formula1-dictionary.net>

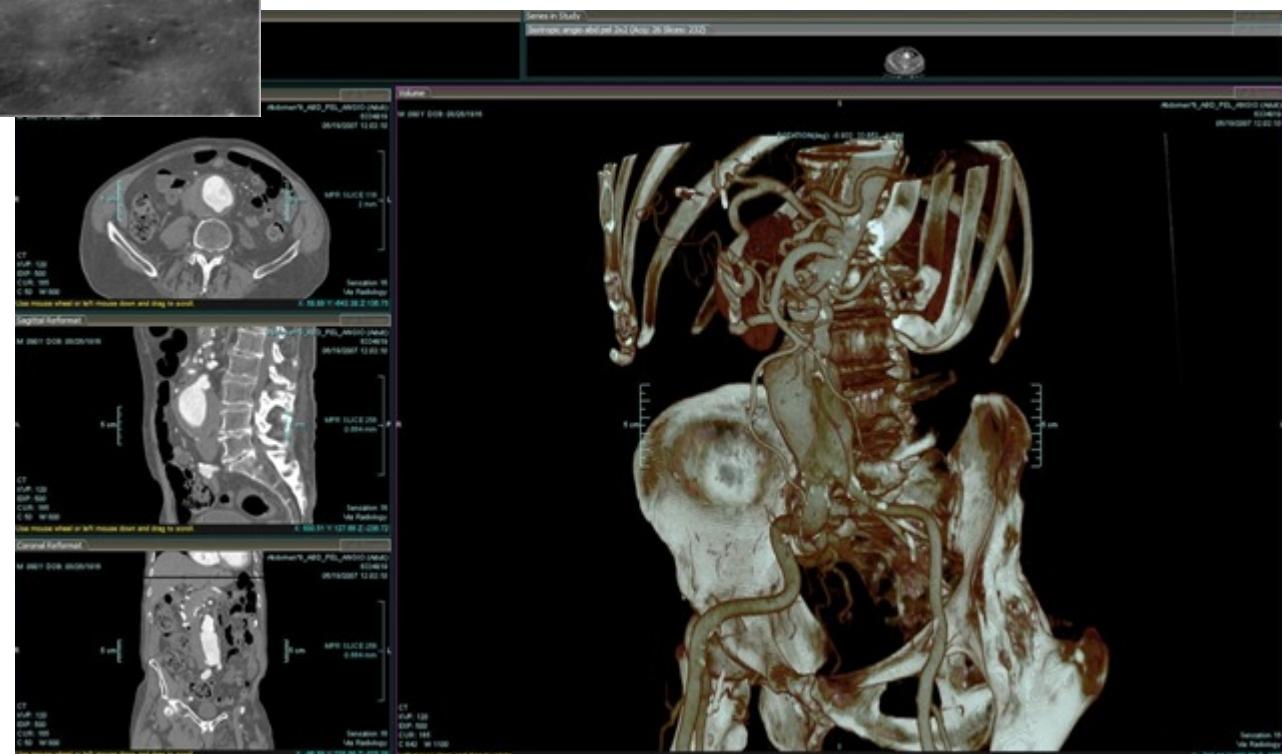


Microsoft Hololens

Scientific Visualization



Chanadrayaan, ISRO



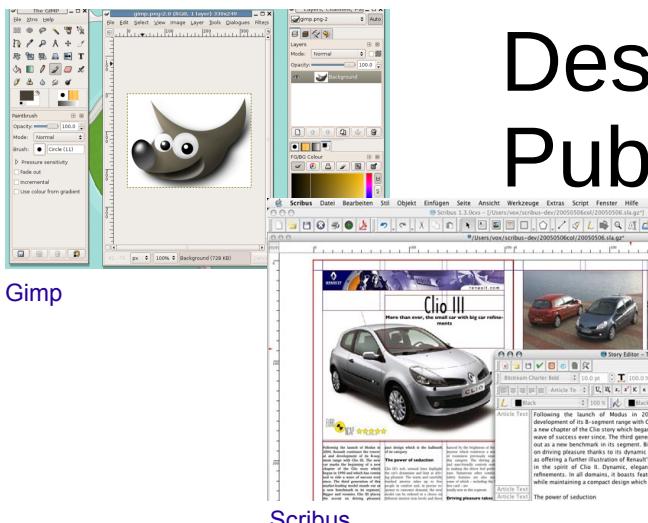
Fiatlux Imaging

Digital and Print Media



Computational Photography

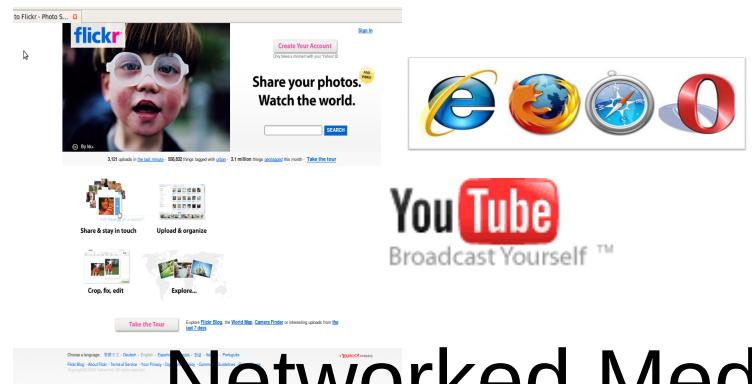
A Agarwala, M Dontcheva, M Agrawala, S Drucker, A Colburn, B Curless, D Salesin, M Cohen:
Interactive Digital Photomontage. ACM Transactions on Graphics (Proceedings of SIGGRAPH 2004)



Gimp

Scribus

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



Microsoft Surface Hub



Wacom Cintiq

Now



Ivan Sutherland's Sketchpad

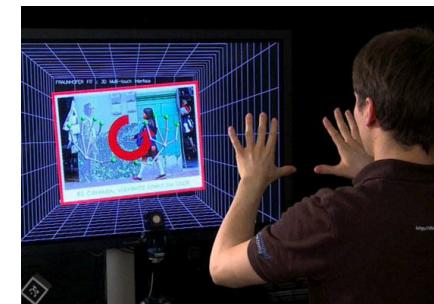


Apple iPhone



© Twentieth Century Fox

Fraunhofer FIT



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.



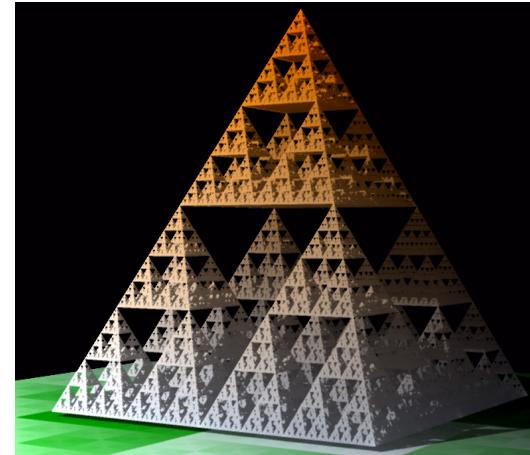
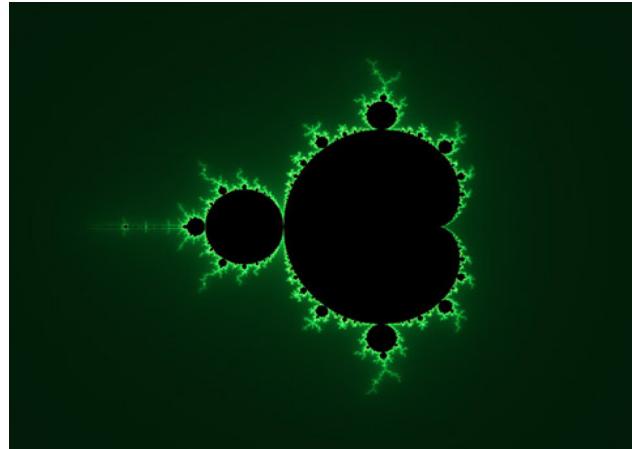
What is Computer Graphics?

- Forget the definitions!
- Remember why you are here.

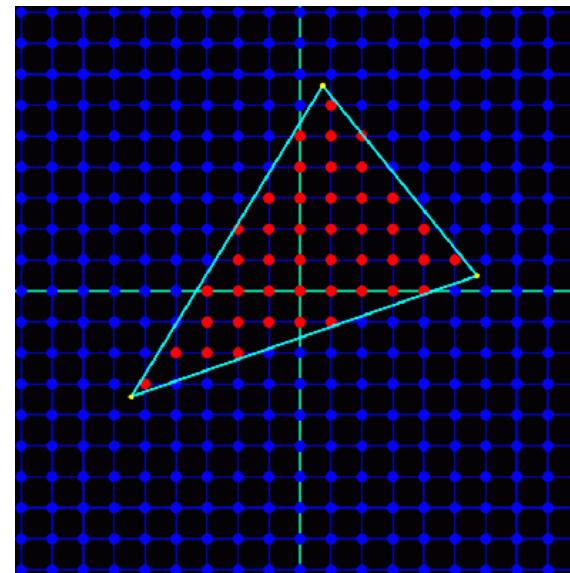


What will we learn in the course? Tentative course content

Drawing in 2D and 3D

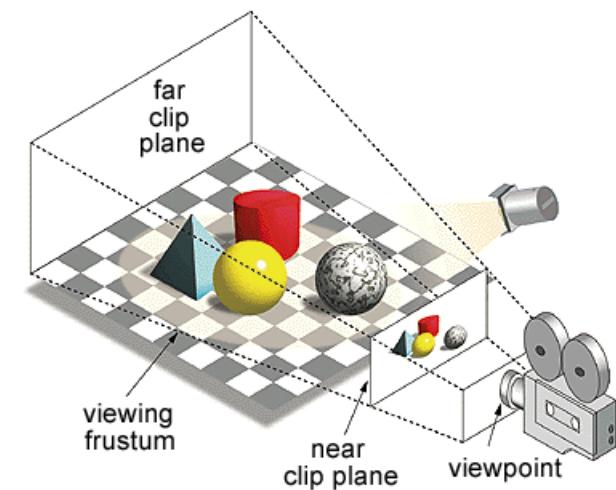
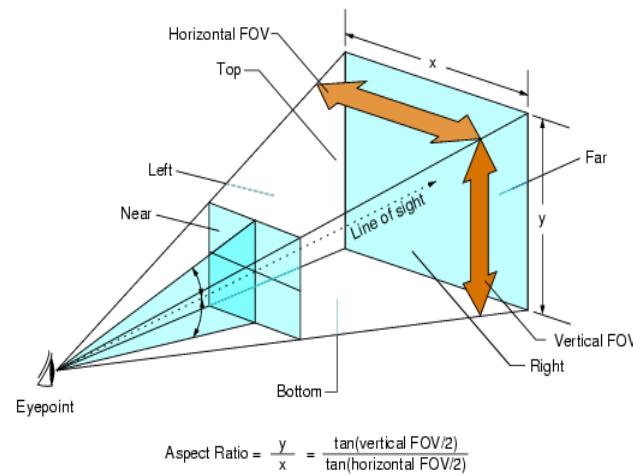
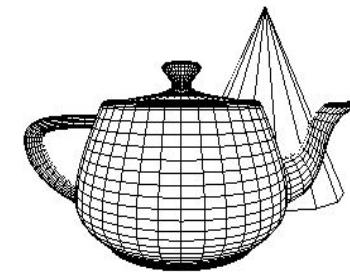
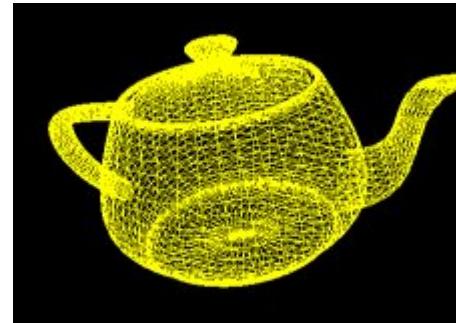


Colouring Pixels



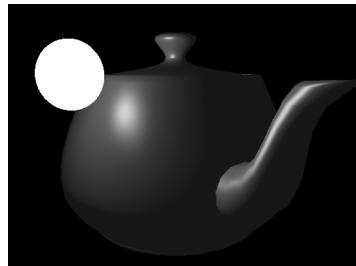
Modeling

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



Rendering

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

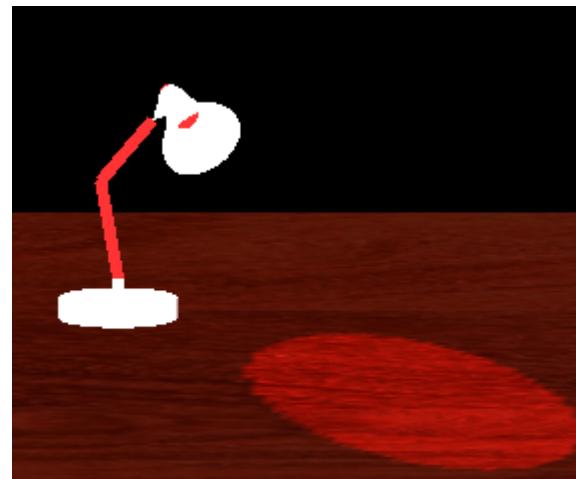


Animation

- 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 mailing lists.
- Programming Assignments – big ones.
- Announced Quizes (Aug 16, Oct 17), Unannounced Quiz
- MidSem (Sep 11 - 16), EndSem (Nov 11 - 22)



Evaluation

- Demos and viva
- 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
 -
 -
 -

Grading

- Class Participation – 5%
- Assignments, Demos, Vivas – 50-60%
- Exams and Quizzes – 35-45%

Unsought Advice

- Attend classes – just the slides and book will **not** be sufficient.
- Do the assignments – plan early, **do not** 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.

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- If you think I am teaching something incorrect – point it out.
 - *If you do it often enough – correctly – you get a bonus!*

Yay!



Let's begin !

Up! © Disney/PIXAR 2009