

CSC 240

Computer Graphics

Fall 2015
Smith College

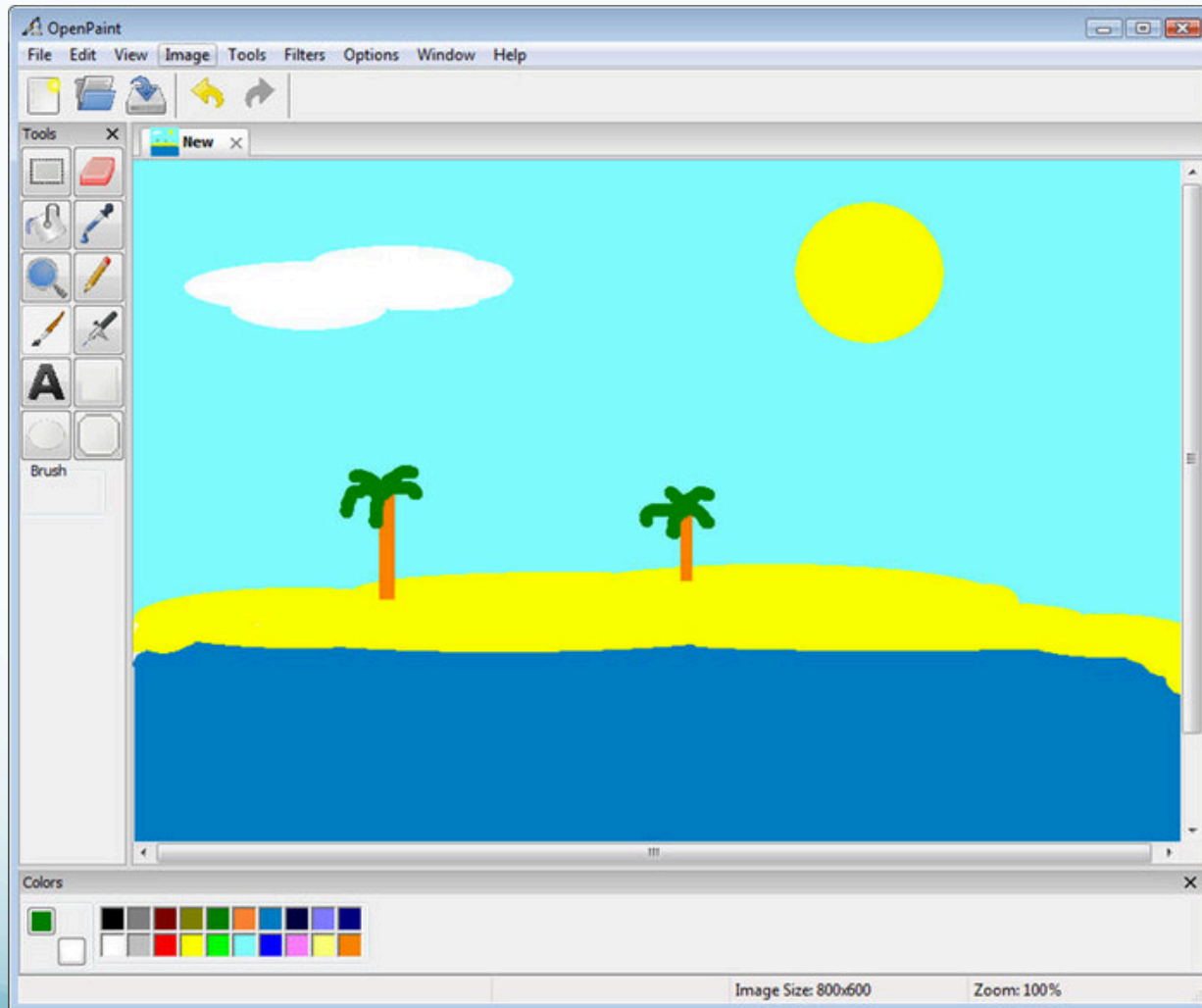
Outline: 9/9

- Introductions
- What is computer graphics?
- Syllabus
- Images and pixels
- Python lab

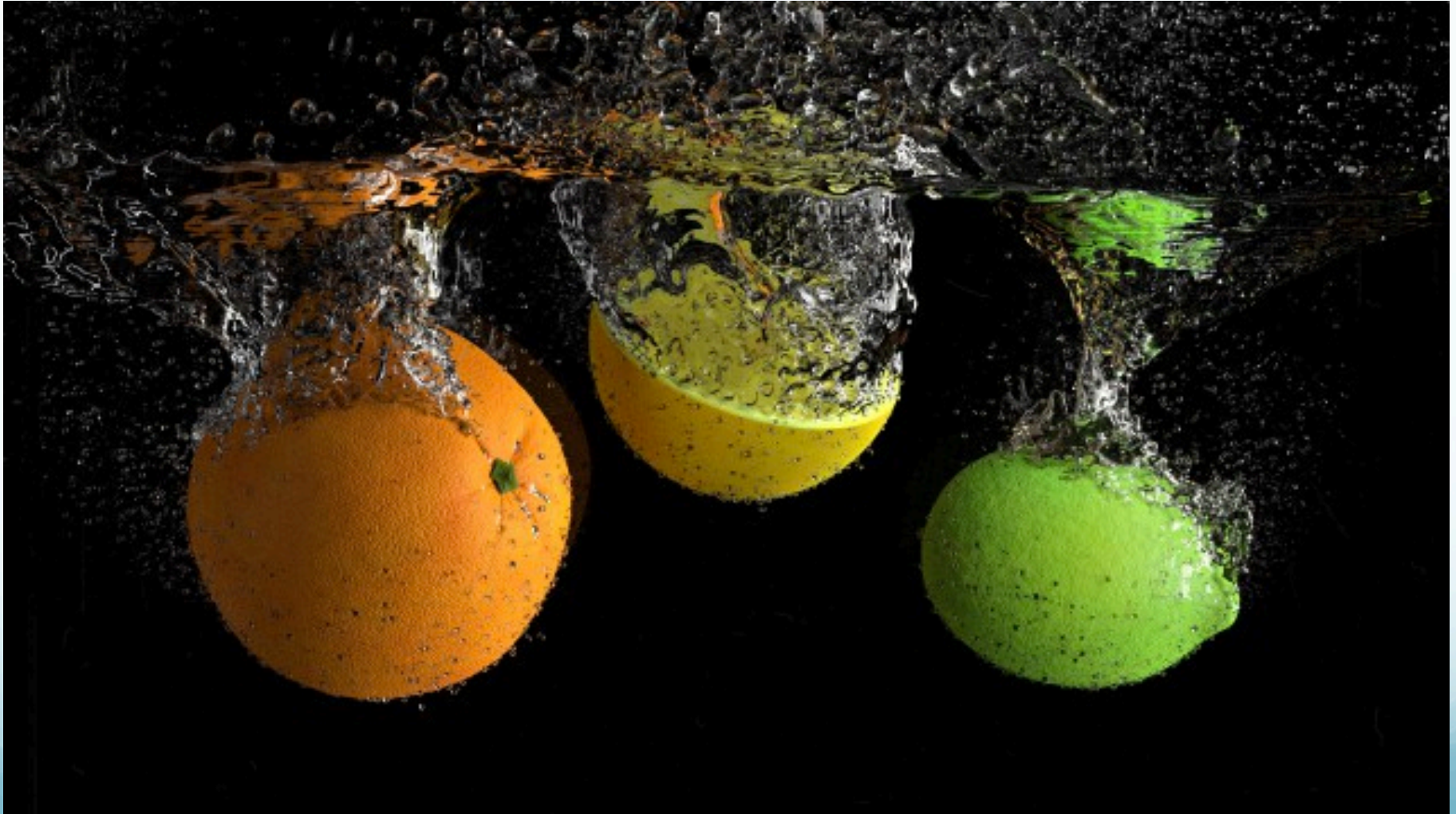
What is computer graphics?

- Creating images using a computer
- Manipulating images
- Modeling and simulation
- Animation and game design
- User-interface design

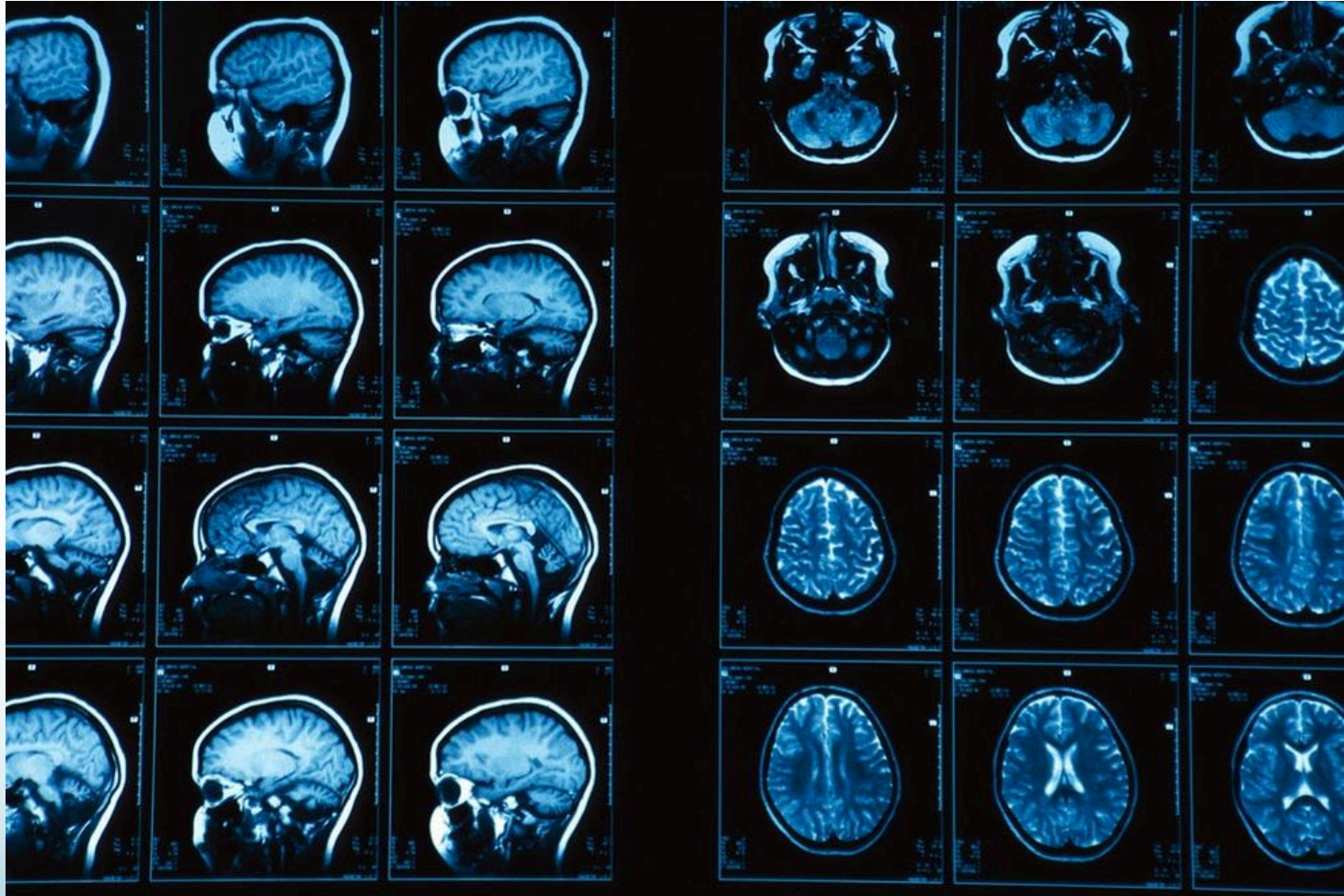
Creating images



Creating images

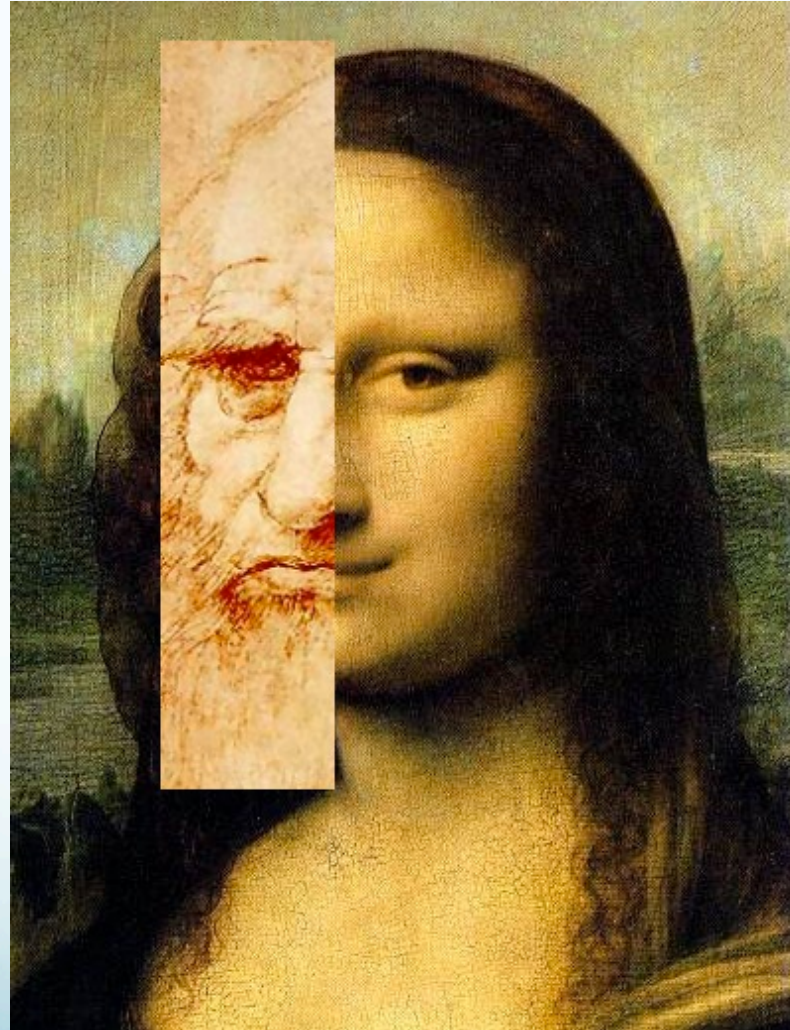


Creating images



Brain MRI scan, by Ken Glaser/Corbis, National Geographic

Manipulating images

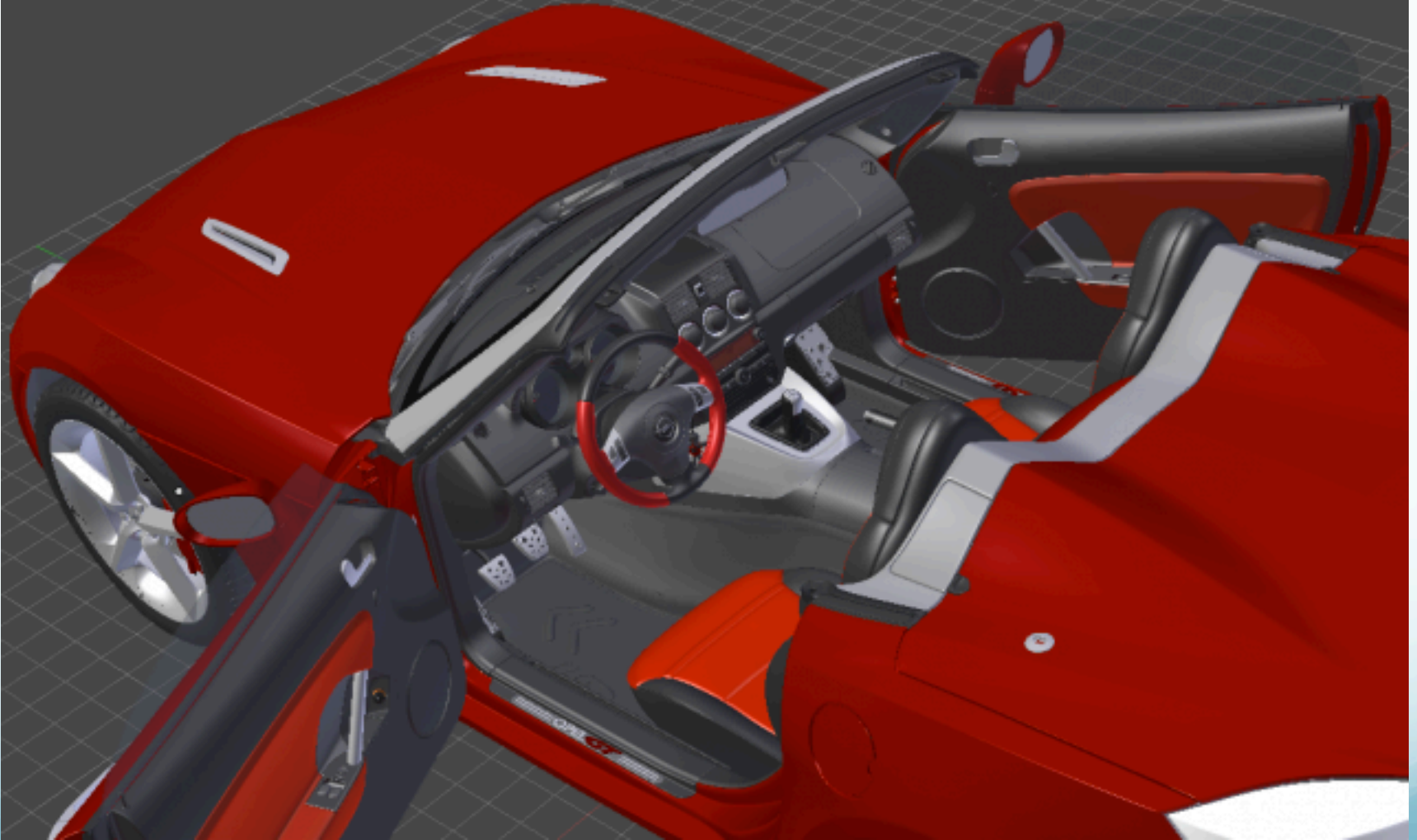


"DaVinci MonaLisa1b" by David R. Tribble

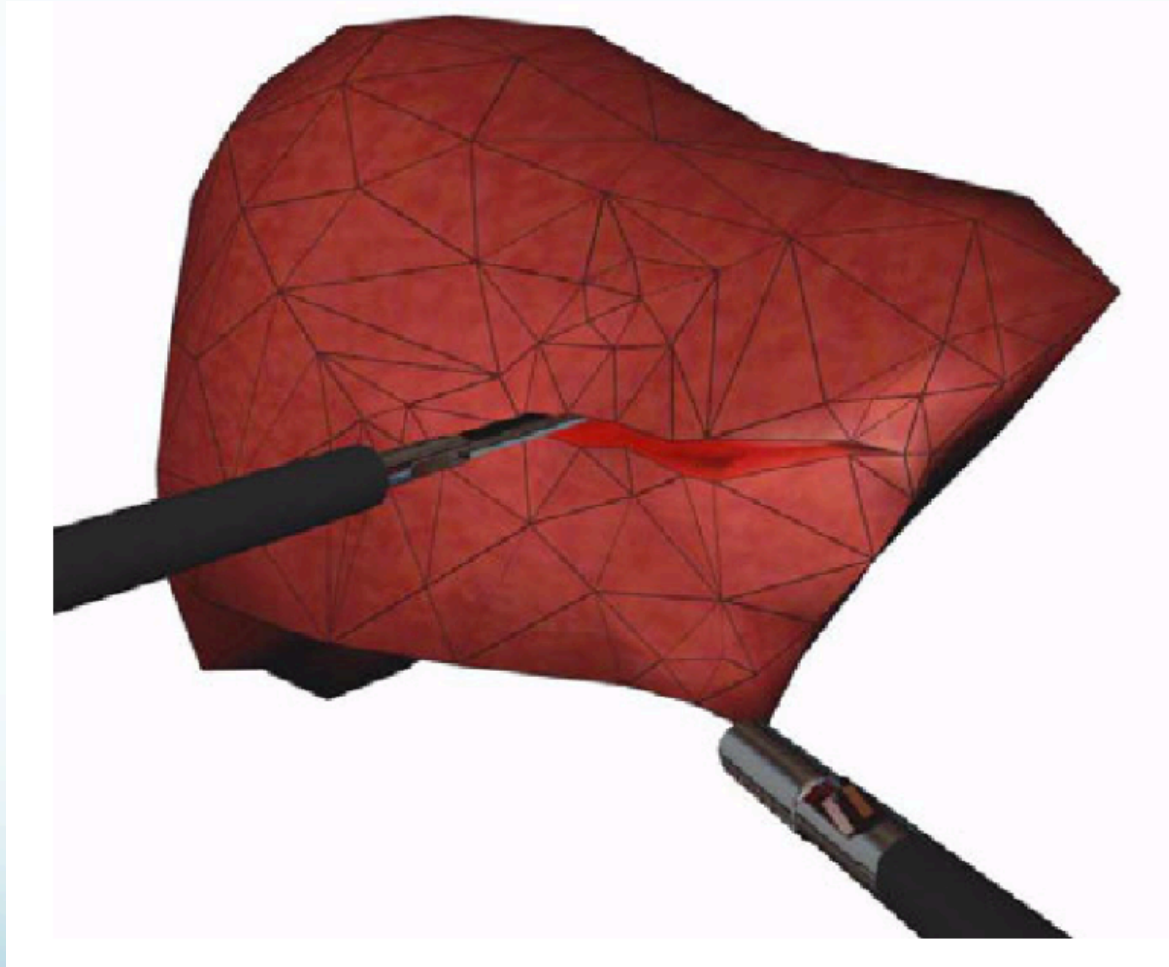
Manipulating images



Modeling and simulation

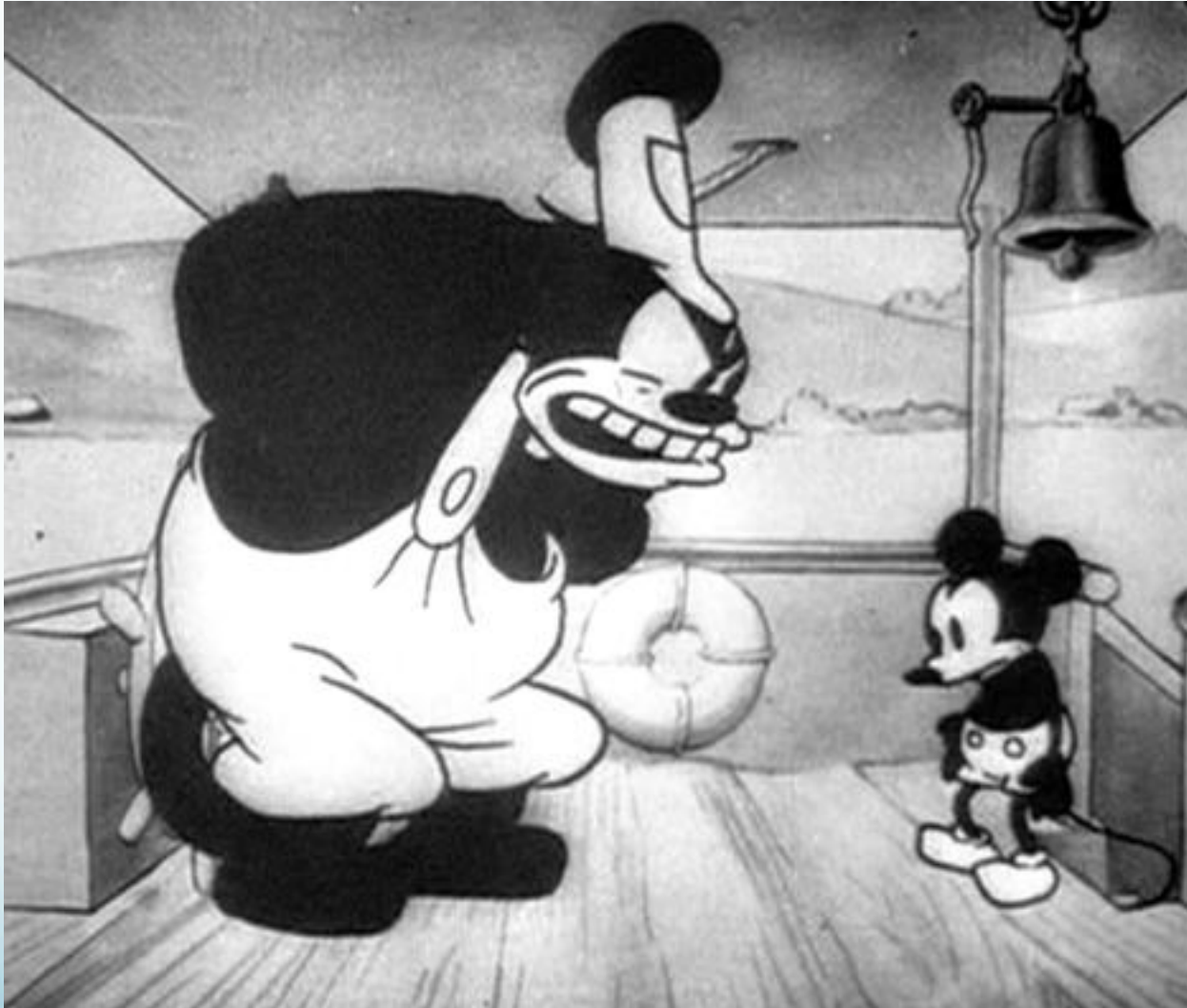


Modeling and simulation



Adaptive tissue modeling, Vidal *et al*, 2006

Animation



“Steamboat Willie”, Disney and Ub Iwerks, 1928

Animation



“Monsters Inc”, Disney/Pixar, 2001

Animation

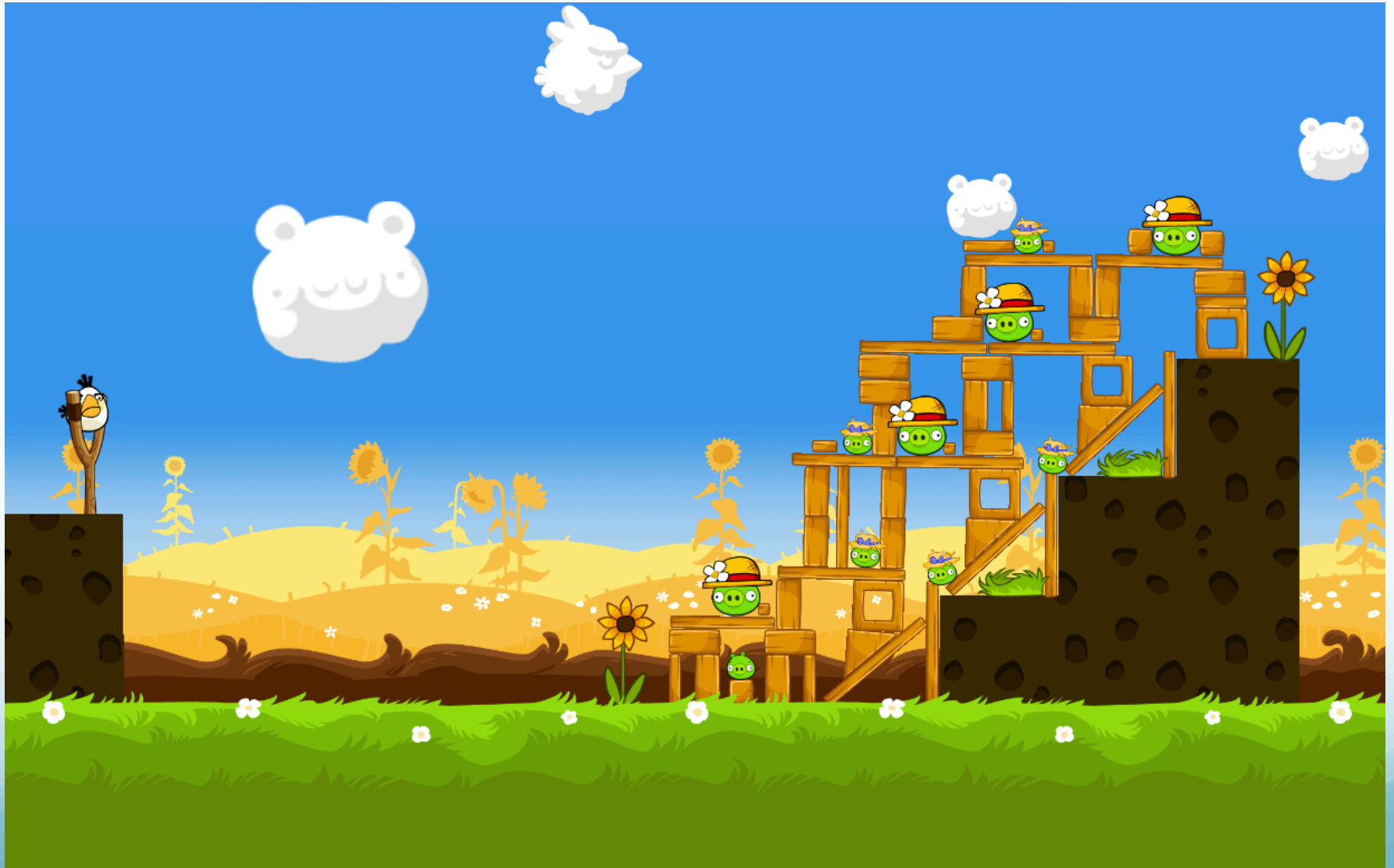


“Frozen”, Disney, 2013

Game design



Game design



User-interface design

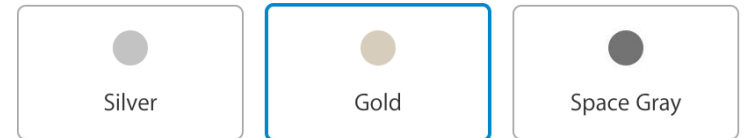


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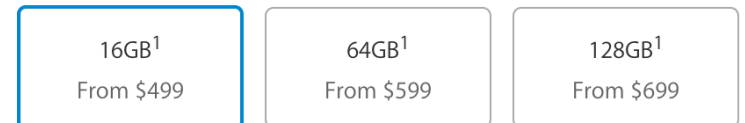
[View gallery](#)

① Choose a finish



② Choose storage

[How much storage is right for you?](#)



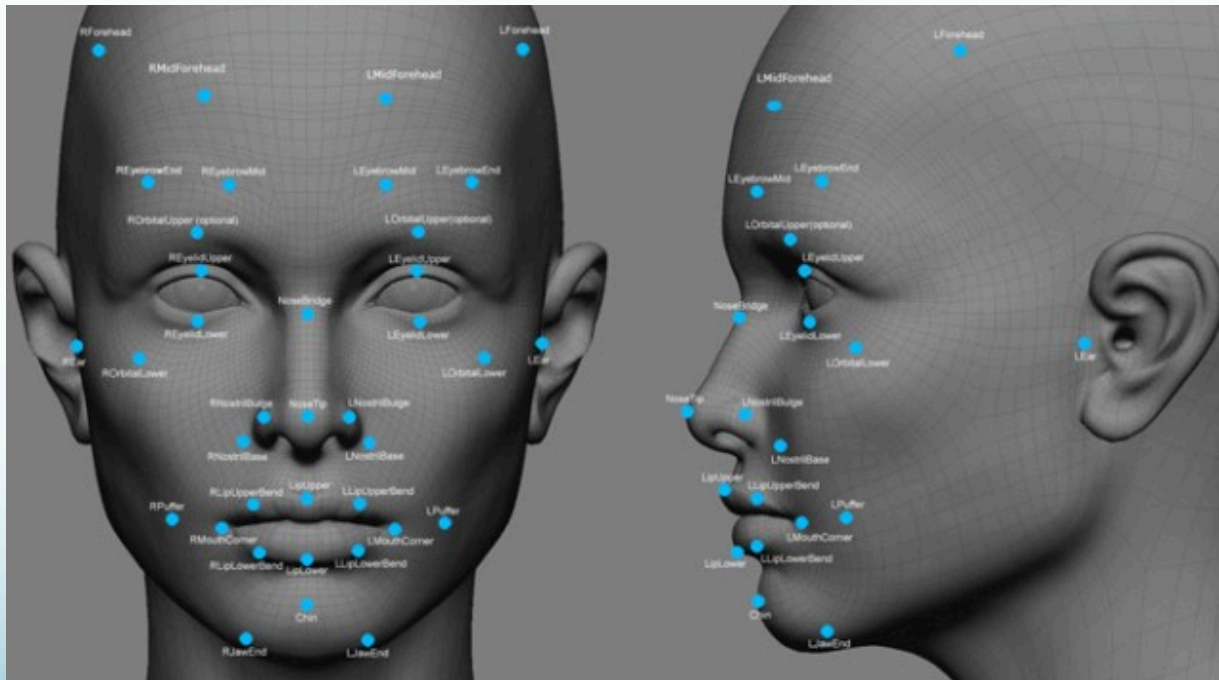
③ Choose connectivity

[What's the difference?](#)



What is computer vision? (not this class!)

- Understanding [natural] images
- Examples: google books, image tagging, self-driving cars



Computer vision



Jeremy Hsu, IEEE Spectrum

Syllabus

Course Goals

- Algorithms and math behind graphics
- Programming skills
- Artistic expression
- Resources for pursuing computer graphics further

Topics (tentative)

- Graphics pipeline and pixel coloring
- Lines, 2D shapes, and fill algorithms
- Transformations
- Splines and Bezier curves
- Perspective
- 3D modeling
- Lighting, shading, and reflectance
- Texture mapping
- Ray tracing
- 3D printing
- (maybe) animation

Prerequisites

- CSC 111: Introduction to Computer Science
- Math 111: Calculus 1

Assignments

- Weekly (due Thursdays)
- Python (OpenGL) and Blender
- Submitted through Moodle
- Lab machines or your own computer

<http://cs.smith.edu/~ssheehan/fall15/csc240/home.html>

Online discussion

- Piazza
 - Class discussion
 - Homework help
 - Clarifications
 - Announcements

<https://piazza.com/smith/fall2015/csc240/home>

Vote for office hours!

Getting help

- Piazza
- Office hours (in office and in lab)
- Fellow students
- Tutoring at the Spinelli Center for Quantitative Learning

Honor code

- Collaboration encouraged!
- Please cite:
 - student collaborators
 - online resources, especially code
 - books
- For most assignments: individual original code

Assessment

- Homeworks: 50%
- Midterm exam: 15% (Oct 21, tentative)
- Final project: 20%
- Final quiz: 10% (Dec 14, tentative)
- Participation: 5%

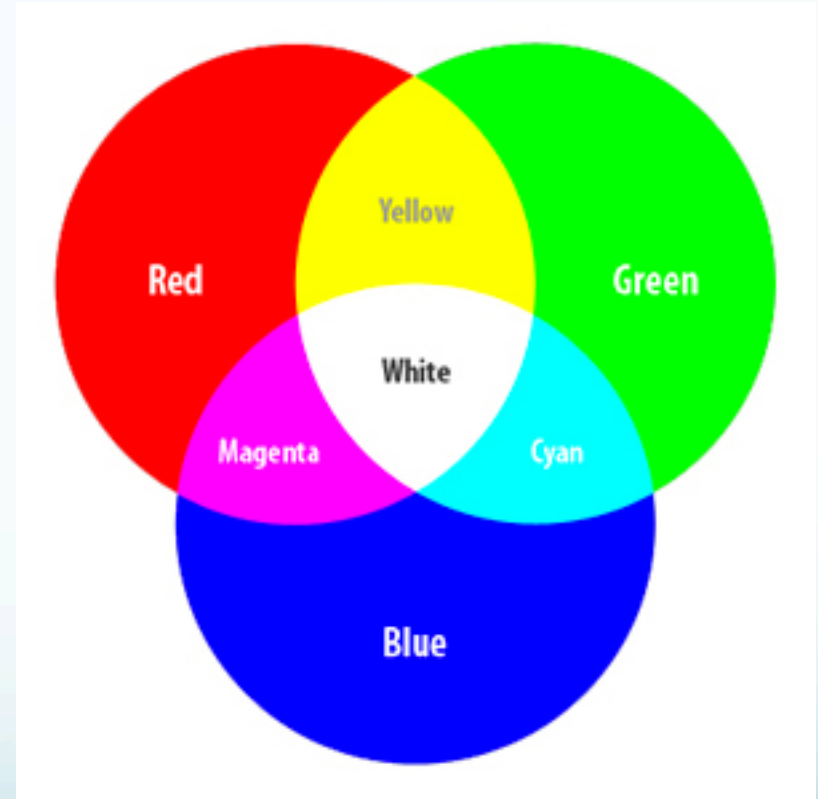
What does CSC 240 fulfill?

- Minor in Computer Science: Digital Arts
- Arts & Technology minor
- Distribution requirement for the Computer Science major (software, theory)

What is a digital image?

Pixel coloring

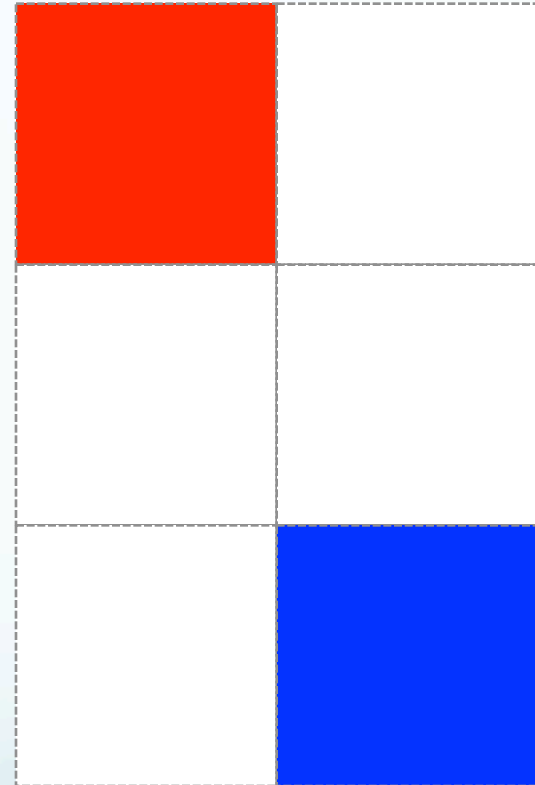
- Red
- Green
- Blue
- “RGB”, each 0-255



www.colorcodehex.com

Simple image format

PPM: Portable Pixel Map



Simple image format

