Advanced Computer Graphics

1 - Course Intro

Yoonsang Lee
Fall 2018

Course Information

- Instructor: Yoonsang Lee (이윤상)
  - yoonsanglee@hanyang.ac.kr

- Course Hompage
  - The lecture home at portal.hanyang.ac.kr
  - Lecture slides will be uploaded to PDS(학습자료) – Course Data(강의자료)

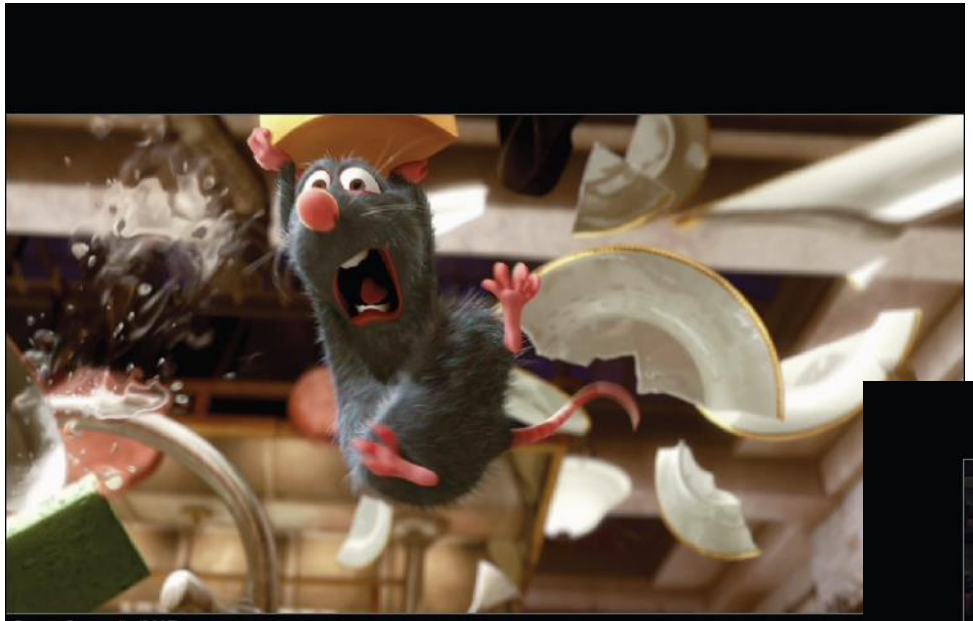
What is Computer Graphics?

- The study of creating, manipulating, and using visual images in the computer.

Actually not only a single image, but also a series of images (animation)

Computer vision inverts the process
Image processing deals with images

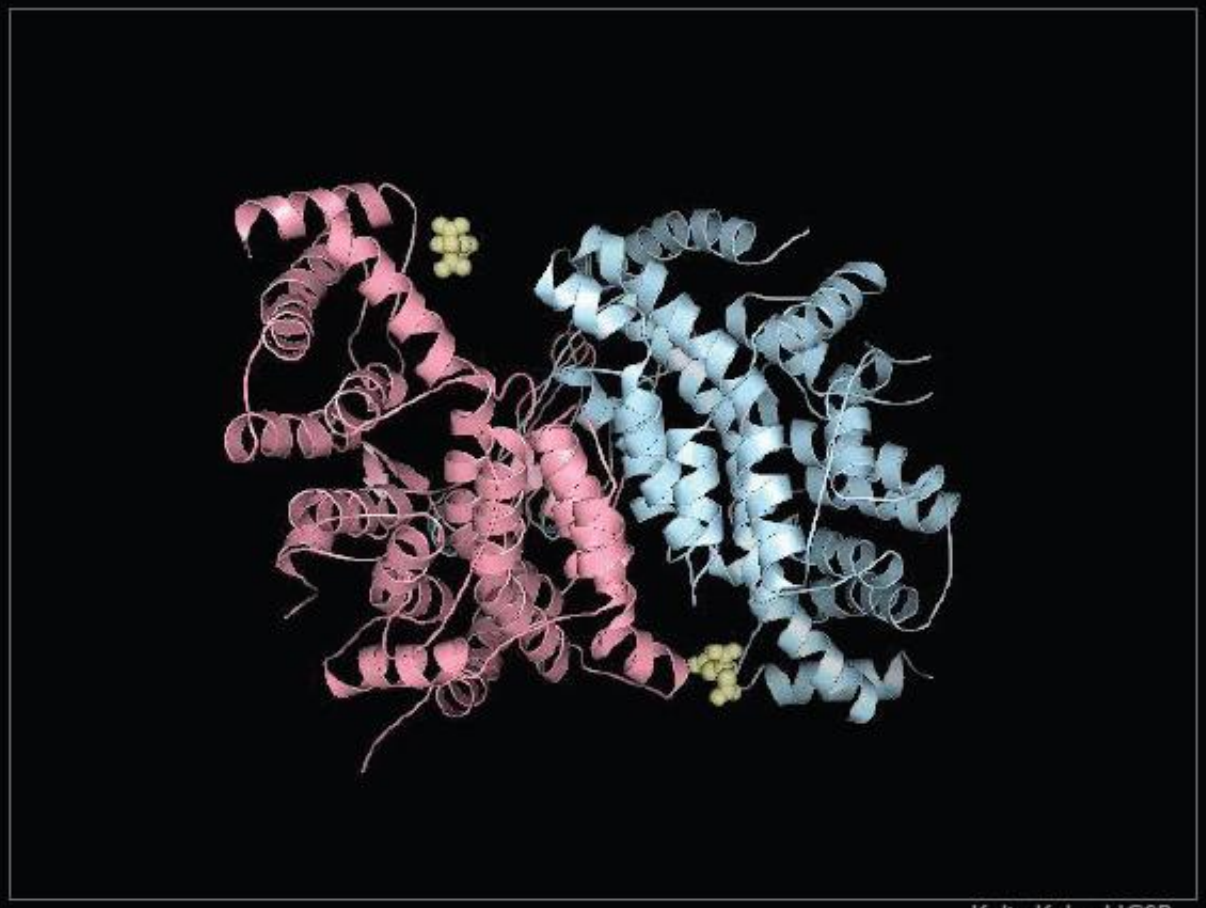
Movies & Games



Pixar—*Ratatouille* (2007)

Electronic Arts—*NBA Live 07* (screenshot: gamespy.com)

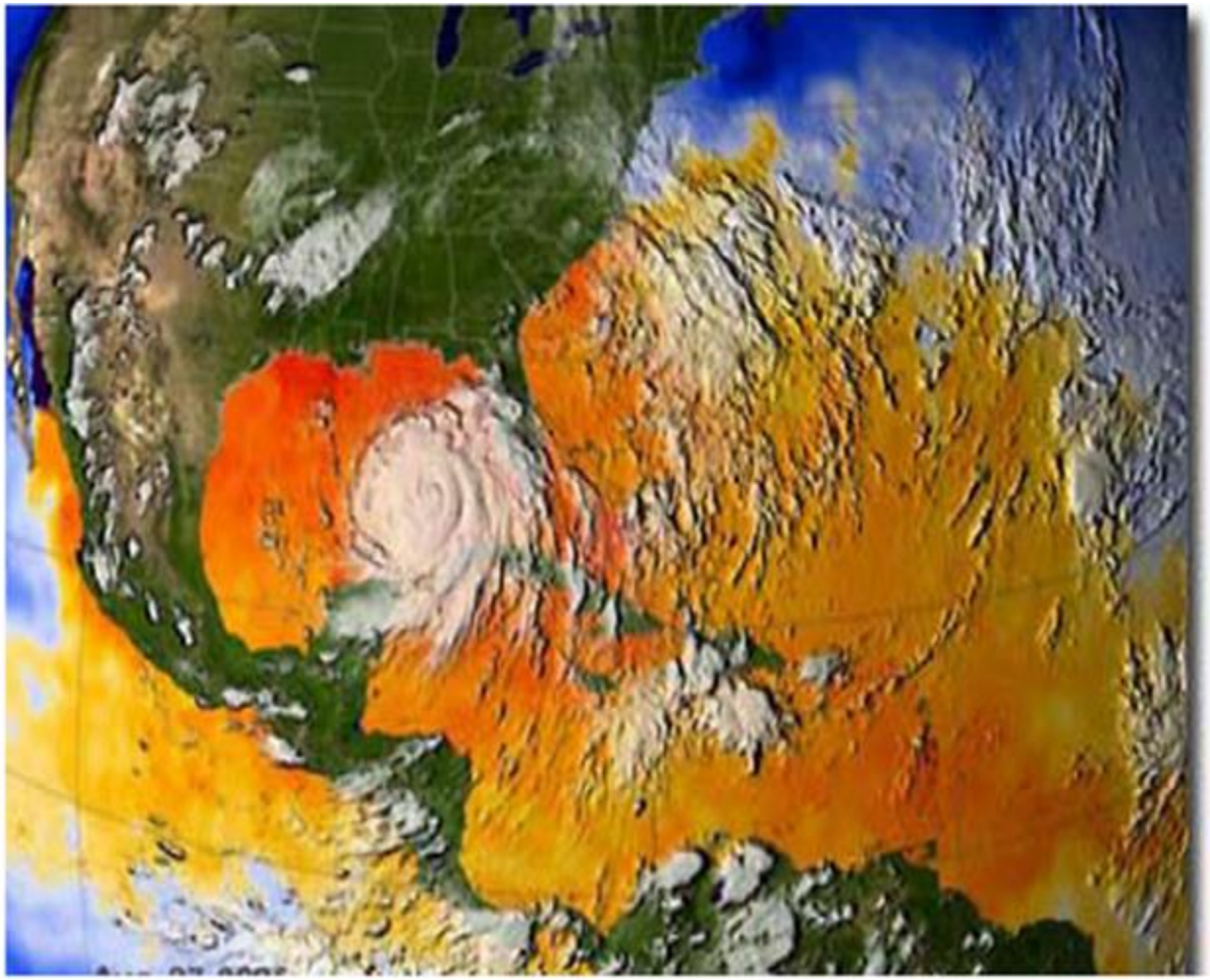
Science and Engineering



Simulated deformation of citrate synthase during substrate binding

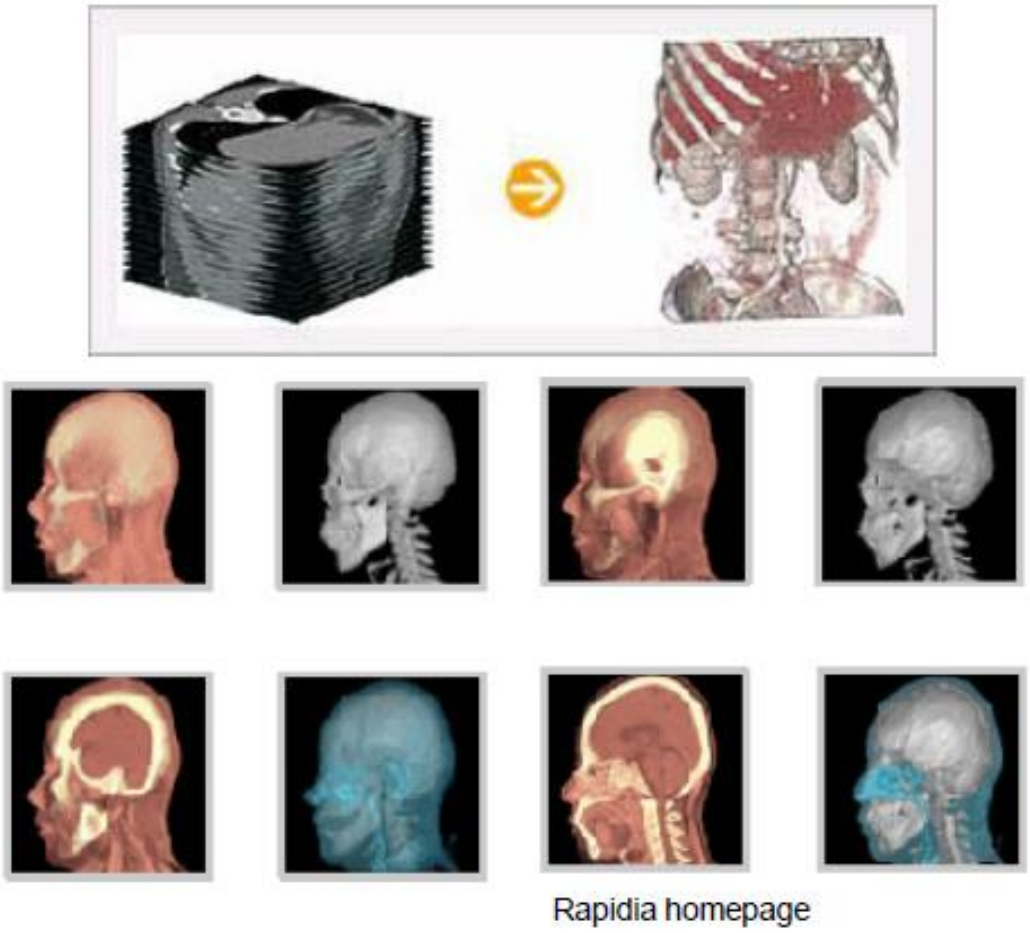
Kalju Kahn, UCSB

Weather Visualization



LLNL

Medical Applications



Rapidia homepage

Computer-Aided Design

Fine Arts

Course Overview

- Computer Graphics: Mathematics made visible

- In this course, you will
  - Explore fundamental computer graphics concepts
  - Write several simple programs (using Python and OpenGL)

- You will not
  - Learn sophisticated computer graphics techniques
  - Learn about modern OpenGL APIs
  - Write big programs

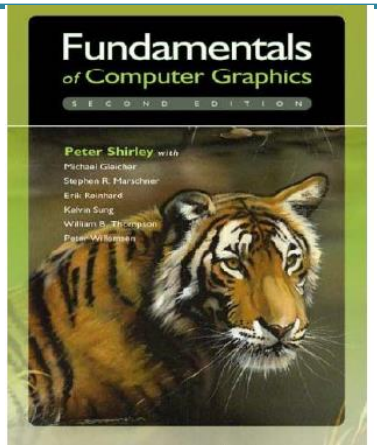
Prerequisites

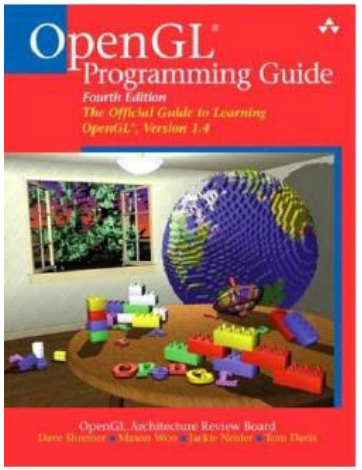
- Basic knowledge of mathematics
  - E.g., vector geometry, linear algebra
- Basic knowledge of programming skill
  - We'll use Python in this class.
- You don't need artistic sense!

Textbook & References

- Textbook : Lecture slides

- References
  - Fundamentals of Computer Graphics
    - 1,2 or 3rd edition
    - Peter Shirley et al.
    - AK Peters
  - OpenGL Programming Guide
    - Version 1.1 is available at internet
    - http://www.glprogramming.com/red/
    - Reference book is also available
    - http://www.glprogramming.com/blue
  - (I don't think you need to buy these books)





Grading

Assignments	30%
Final exam	50%
Attendance	10%
Class attitude	10%

- Late three times -> count as one absence

Schedule

1	주제	Course Intro Introduction to OpenGL	9월 5일
2	주제	2D Affine Transformations, Frame Buffer Homogeneous Coordinates, 3D Affine Transformations	9월 12일
3	주제	Reference Frame, OpenGL Transformation Functions Affine Matrix, Hierarchical Modeling	9월 19일
4	주제	No Class	9월 26일
5	주제	No Class	10월 3일
6	주제	Rendering Pipeline, Viewing Transformation Projection Transformation, Viewport Transformation	10월 10일
7	주제	Vertex Processing Review, Triangle Mesh Triangle Mesh	10월 17일
8	주제	No Class	10월 24일
9	주제	Light, Phong Illumination Model Shading, Lighting & Shading in OpenGL	10월 31일
10	주제	Orientation & Rotation Rotation Matrix	11월 7일
11	주제	Animation: Intro Animation: Interpolation, Kinematics, BVH	11월 14일
12	주제	Curve: Basic Bezier Curve & Splines	11월 21일
13	주제	Texture	11월 28일

Assignments

- About 10 simple programming assignments
- Check the assignment menu of our lecture home
- Submit your assignment **only through the assignment menu of the lecture home**
- **NO SCORE** for late submissions
  - Submit before the deadline!