Lecture 1
Introduction

Dr. Lin ZHANG
School of Software Engineering,
Tongji University
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Self Introduction

• B.Sc., Computer Science and Engineering, Shanghai JiaoTong University, 2003
• M.Sc., Computer Science and Engineering, Shanghai JiaoTong University, 2006
• PhD., Computing, The Hong Kong Polytechnic University, 2011
• Software Engineer, Autodesk Inc., 2005~2007
• Research Assistant, The Hong Kong Polytechnic University, Mar. 2011~Aug. 2011
• Assistant Professor, SSE, Tongji University, Aug. 2011~present
Self Introduction

Contact Information

RM 412, Jishi Building
Email: cslinzhang@tongji.edu.cn
Tel: 69589456

TA: Hao WENG, RM 316, Jishi Building
Email: qingmuxiang_123@126.com
QQ: 448025392

Course information can be found at
http://sse.tongji.edu.cn/linzhang
Materials

• My slides
• Some papers

D. Hearn and M.P. Baker,
Computer Graphics with OpenGL
(3rd edition),
Prentice Hall, 2003

This book only provides some basic knowledge. *No single textbook can cover my topics!*
Examination

• Homework 45%: 3 times, and each time 15%.
• Project 50%: 2 or 3 people for one group
• Attendance 5% (being absent >=5 times, you will fail this course)
• Bonus 5%: being active in class and answering my questions correctly
Today

- What is computer graphics?
- Course overview
- Course requirement
What is Computer Graphics?

- Study of: digital synthesis and manipulation of visual content, and interaction with it
What is Computer Graphics?

• Graphics is: **Modeling**

Character modeled in Mudbox (Dave Cardwell)

Mold modeling and validation in Inventor
What is Computer Graphics?

- Graphics is: Rendering
What is Computer Graphics?

• Graphics is: Rendering
What is Computer Graphics?

• Graphics is: **Rendering**
What is Computer Graphics?

- Graphics is: **Animation**

Construction and optimal search of interpolated motion graph (Siggraph 2007)
What is Computer Graphics?

• Graphics is: **Physical Simulation**

A Mass Spring Model for Hair Simulation (Andrew Selle, Siggraph 2008)
What is Computer Graphics?

- Graphics is: **Digital Capture**
What is Computer Graphics?

- Graphics is: **Image Processing**

Image Analogies (Hertzmann et al., 2001)
What is Computer Graphics?

- Graphics is: **User Interface**

Windows 7 (Microsoft, 2009)

iPad (Apple, 2010)

Multi-touch wall (Perceptive Pixel, 2007)

Wii (Nintendo, 2006)
What is Computer Graphics?

- Graphics is: Visualization
What is Computer Graphics?

• Graphics is: Visualization
What is Computer Graphics?

- Graphics is: **Entertainment**

World of Warcraft (Blizzard, 2004)

Crysis (Crytek/EA, 2007)

Transformers (DreamWorks LLC and Paramount Pictures, 2007)

Toy Story, the first full length film produced entirely on computers (Pixar/Disney, 1995)
Course Outline

- 3D Modeling
- Mesh Manipulation
- Surface Shading Models
- Ray-tracing
- Texture Mapping
- Global Illumination
- Skinning and Morphing
- Image Based Techniques
- Non-Photorealistic Rendering
- Other Topics if Possible
What is not covered in this course?

- Computer game development
- Computer movie development
- Animation development

We only focus on technical aspects in this course!
General Comments

Prerequisites

- Linear Algebra
- Matlab Programming
- C++ Programming

Something you may need to learn off-class

- OpenGL?
- D3D?

For all the questions about programming, please refer to TA!
What capabilities can be improved in this course?
What capabilities can be improved in this course?

- Working attitude
- Theoretical analysis
- Team working
- Communication
- Expression
- Presentation
Let’s start this amazing journey!