Video Game Graphics AD-011

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You will learn

- How real-time graphics and rendering work
- Difference from pre-rendered graphics
- What is possible/impossible and how much it costs
- To understand and collaborate with engineers
- To embrace the technical limitations
- How to use advanced graphics settings of your favorite games ;)

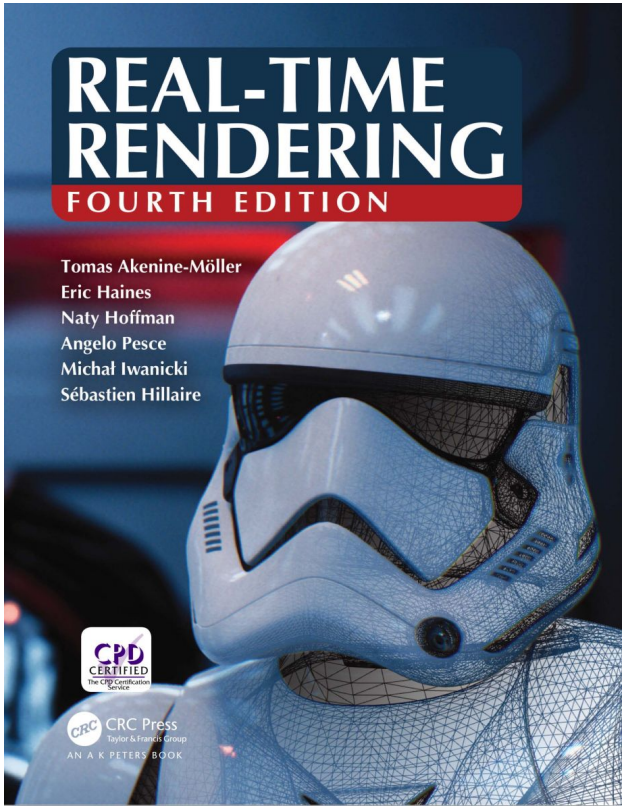
This course is not...

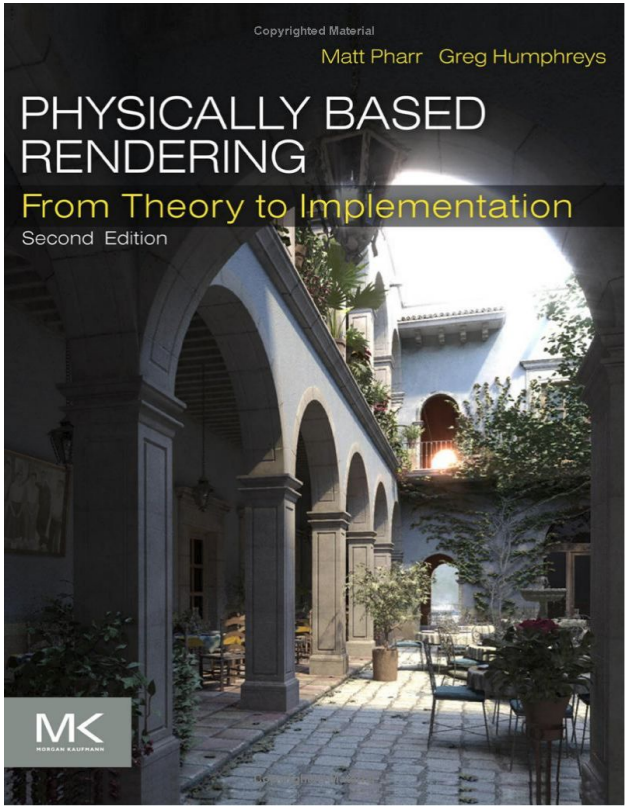
- This course is not an art course
- While artistic skills are appreciated, they will not be judged

You will do

- Some homework
- Write javascript
- Use Github
- Exam

Books


REAL-TIME RENDERING
FOURTH EDITION
Tomas Akenine-Möller
Eric Haines
Naty Hoffman
Angelo Pesce
Michał Iwanicki
Sébastien Hillaire
CPD CERTIFIED
CRC Press
Taylor & Francis Group
AN A K PETERS BOOK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Matt Pharr Greg Humphreys
PHYSICALLY BASED RENDERING
From Theory to Implementation
Second Edition
MK
MORGAN KAUFMANN

Additional online course

Interactive 3D graphics by Autodesk

https://eu.udacity.com/course/interactive-3d-graphics--cs291

Schedule

11.	September	10:00	Introduction - WTF is graphics?
18.	September	10:00	Graphics Processing Unit
25.	September	10:00	Rendering pipeline
02.	October	10:00	Texturing and Memory
09.	October	10:00	Lighting and Shading models
16.	October	10:00	Transparency and Blending
23.	October	10:00	Shadows and Reflections
30.	October	10:00	Image effects and Particles
06.	November	10:00	Rendering optimization
13.	November	10:00	Future of graphics - Ray tracing
20.	November	10:00	Exam


McLaren


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STORIES.NITRONATION.COM
MOOR


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SECRET
THE X-FILES: DEEP STATE © 2017 TWENTIETH CENTURY FOX FILM CORPORATION. ALL RIGHTS RESERVED.

What is game graphics?

Video Game Graphics AD-011

Video game graphics =
Real-time computer graphics =
Interactive graphics

Graphics as information

1. Computer memory
2. Screen
3. Eye
4. Brain

2D or 3D?

- Graphics is physically always rendered in 2D
- Image perception by human brain is always in 3D

Real-time graphics

- Image is rendered while previous image is being displayed on the screen
- Image is affected by user input
- The cycle of rendering and input happens fast enough that the user does not see the individual images
- How fast is fast enough?

FPS (Frames Per Second)

- First silent movies - 16 fps
- Movie theater - 24 fps
- European TV - 25 fps
- Game console - 30 fps
- Computer monitor - 60 fps
- VR headset - 90 fps

Game graphics as visual art

- Probably most technically complex visual art
- Requires a lot of scientific research and engineering
- Full of hacks and approximations
- Constantly tries to trick the viewer as a magician
- Introduces enormous amount of limitations for the artists

Embrace the limitations

- Real-time graphics is probably one of the most technically complex visual arts
- Adopt the mindset of loving the complexity and limitations
- Not being frustrated by them
- Important for understanding and collaborating with engineers