Multimediaprogrammierung

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Goal of the lecture

- Understand concepts of shader programing

- Creation of demos
    - What is a demo?
    - Self-contained computer programs that produce audio-visual presentations
    - **Examples**

Demo scene

- International computer art subculture

- Creates demos
  - To show off programming, artistic, and musical skills

- Demo groups
  - Small, tightly-knit groups, centered around a coder (programmer), a musician and a graphician (graphics designer)
  - Fairlight, Future Crew, Still, …

- Demo parties
  - Competitions, drinking, share content…
  - Revision (Saarbrücken), Evoke (Köln), …

Demo scene - history

- Started with cracktros
  - Crack a game
  - Add loader
  - Distribute

To Do

- Build teams of 1-4 person(s)

- Create your own demo

  - Showcase cg (shader) effects in demo parts

- Present your demo at (internal) demo event

  - Who want's to go to a demo party and show her/his stuff?

- Video of your demo for YouTube, HS homepage

- Upload your demo on Moodle

Grading

- Outcome at demo event presentation
    - How many effects?
    - How cool looks demo?

- Team gets one grade
    - Team members distribute grade within team

LVA structure

- T… theory
  - Frontal lectures + discussions
- W… working
  - Working on shaders and your project
- P… presentation of your demos (28.1.)
- Room T009

	Month 1				Month 2				Month 3				Month 4			
Lecture	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T W	T W T P

Lecture Content

- Shader programing
  - Pixel shader
  - Vertex shader
  - [Geometry shader]
  - [Tesselation shader]
- CG Effects
  - Ray tracing (distance fields)
  - Illumination models
  - Ambient occlusion,
  - Environment/normal mapping, displacement mapping
 - HDR rendering, bloom, motion blur, depth of field

Programing framework

- OpenGL shading language
    - www.shadertoy.com
    - glslsandbox.com
    - C#/C++
    - WebGL (JavaScript)

Moodle

- Project upload
- Forums for questions
- Slides
- Examples
- Framework
- ...

Books on OpenGL

- Basic knowledge about OpenGL
  - "Red Book"
  - Free: Google: "redbook pdf"
  - Newer version also contain **shader programming**
  - Latest: 8th Edition
  - Tutorials
   - nehe.gamedev.net
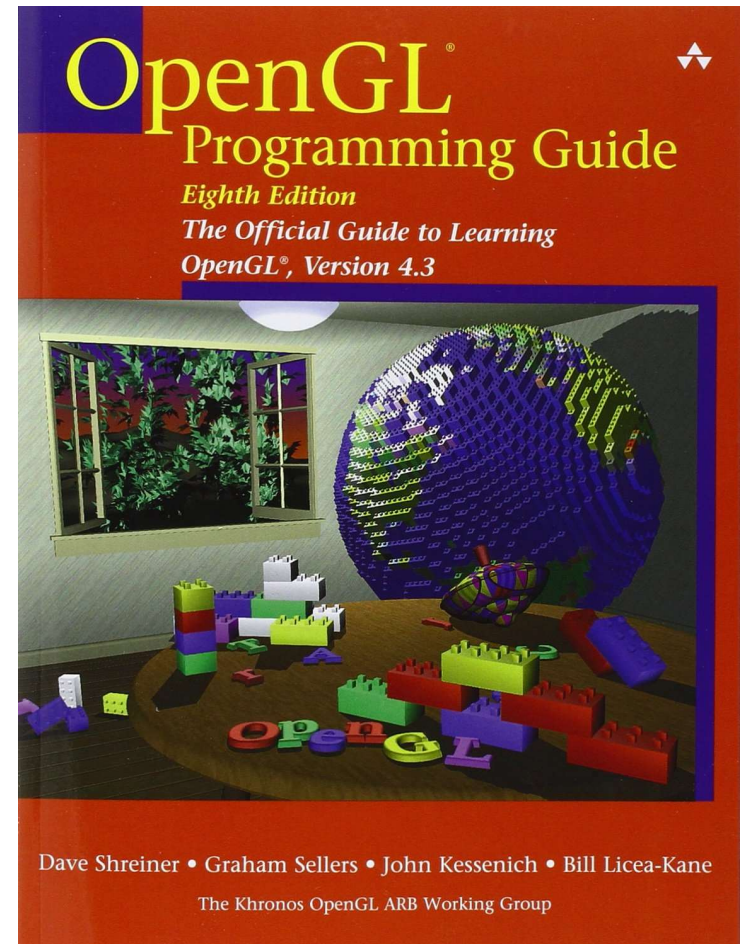
Books

- **Real-Time Rendering, Third Edition**
  - Tomas Akenine Möller, Eric Haines
  - AK Peters, 2008 (3rd edition)
  - Covers all standard methods
  - www.realtimerendering.com
  - Real-Time Rendering Resources
    - Huge collection of on/off-line resources
    - Online books (#books)
    - Software
    - API information
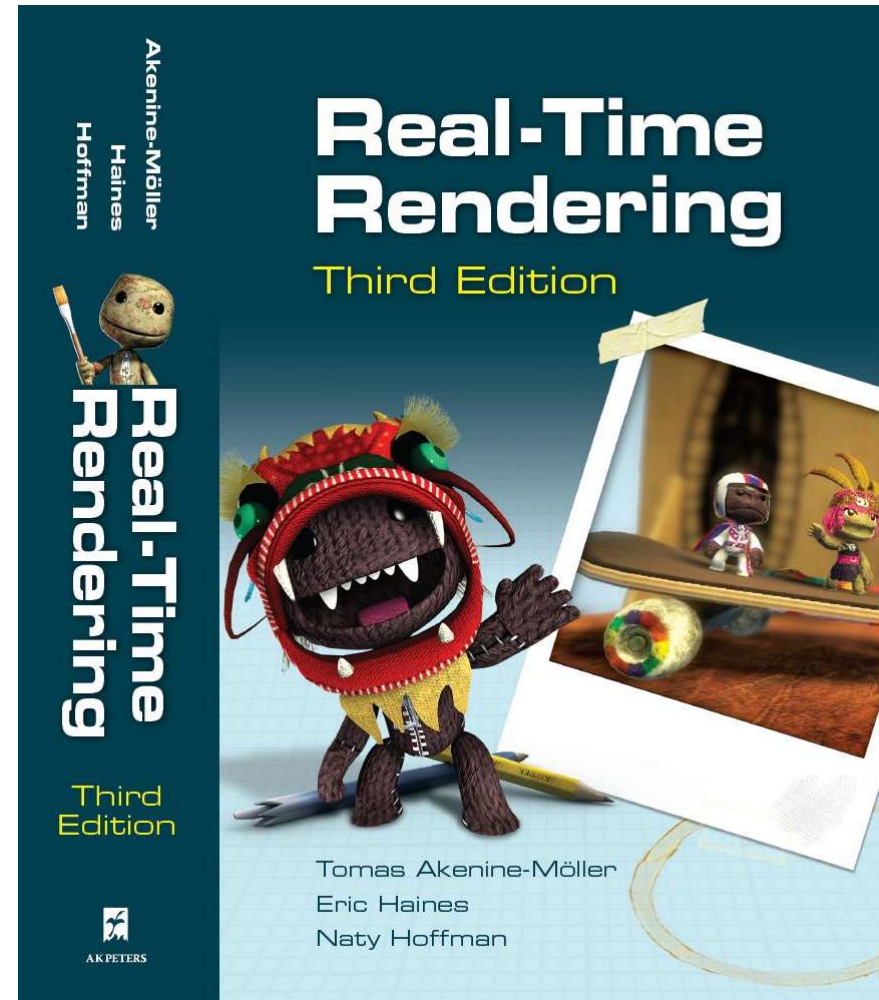
Books

- Foundations of 3D Computer Graphics
  - ST 320 G675 D771
- Mathematics for 3D game programming and computer graphics
  - ST 320 L566 M426(3)
- Interactive computer graphics
  - 346594154
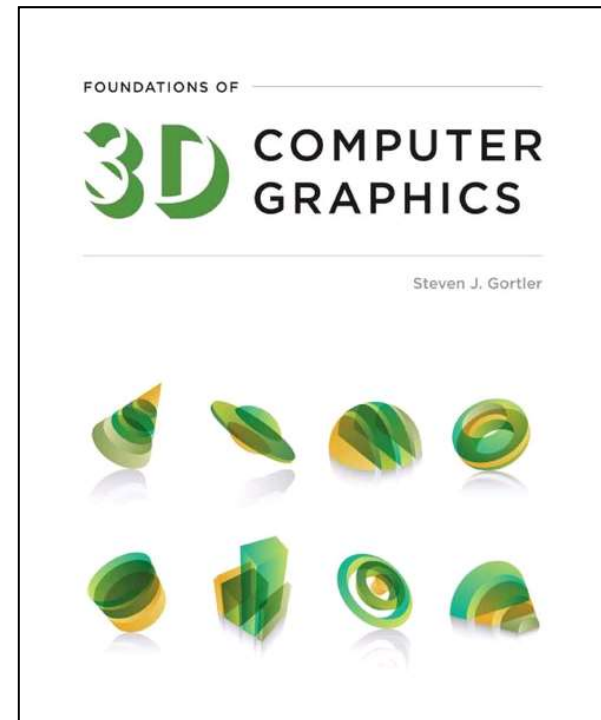
Resources

- www.scratchapixel.com
  - Theory and math
  - Tutorials
  - Example code

- portal.hs-weingarten.de/web/scherzer/links
  - Some links on games and computer graphics

- www.scene.org
- www.demoparty.net