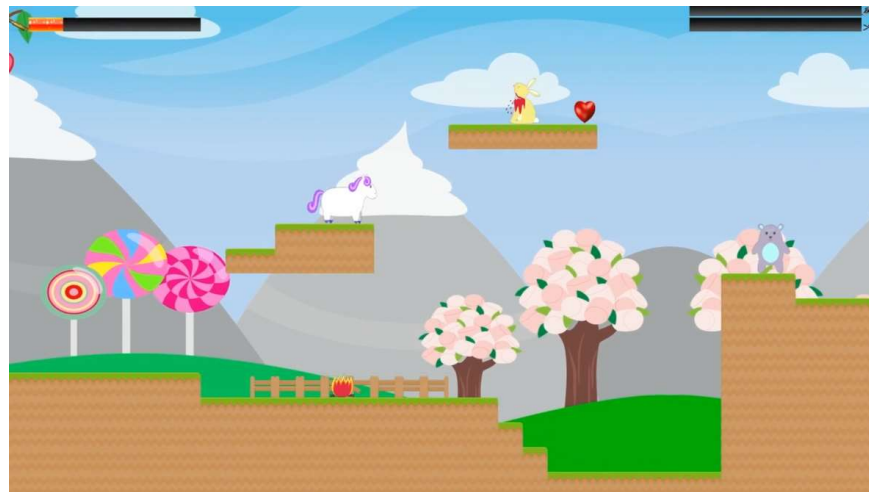


Computergrafik

Spiele 2D

Goal of the lecture

- For you to understand concepts
 - 2d computer graphics (raster graphics, vector graphics, ...)
 - Software engineering (SCRUM, OOP, ...)
- A working **game**
 - Examples



Approach – SCRUM [with SE]

- Why?
 - Adaptable to changing targets
 - Introduce some organization – but little overhead
- Recitation
 - <https://www.video2brain.com/de/videotraining/agile-softwareentwicklung-mit-scrum>
 - Complete course (3h34)
- Product backlog (prioritized todo list)
- (Very short) meetings
- Sprints (implementation cycle)

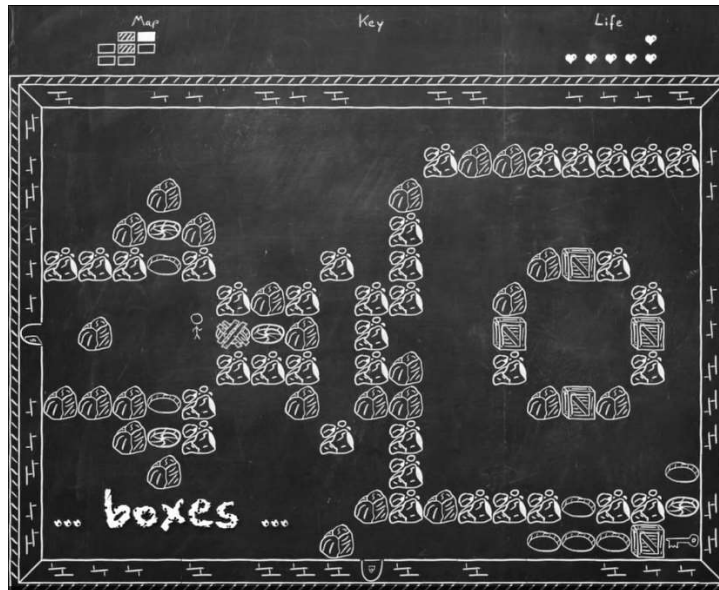
Todo

- Form teams of 3-5 person(s) [with SE]
- Design and implement a 2D game [with SE]
 - Work in SCRUM teams
 - Meetings
- 5 project progress presentations [with SE]
- 1 minute let's play video on YouTube



Project: 2D game

- If existing game → introduce a twist
 - No exact copies allowed!
- C# and OpenGL
- **Free** textures/sprites/sounds from web ok



Grading

- Outcome at presentations
- Active participation at meetings with tutors
- Time spent on project
- Team gets one grade
 - Team members distribute grade within team



Lecture Content

- Game concept and design
- Game programming
 - OOP approaches
- 2D graphics (OpenGL and hardware internals)
 - Transformation
 - Culling/clipping
 - Rasterization
 - Drawing lines, triangles, polygons, text
 - Textures
 - Anti-aliasing
- Collision detection

LVA structure

	Month 1								Month 2								Month 3								Month 4							
Lecture	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C	T	C				
Project	S				S				S				S				S				S				S							
Talks	P								P								P								P							

T... theory, programming examples

C... coaching/meetings (tutors/myself)

S... sprints (2 week sprints) ~ 7 sprints total

P... project progress presentations (graded)

Both in T₁₁₁

LVA structure (talks together with SE)

- 12.10.: Presentation game concept
- 09.11.: Presentation prototype
- 21.12.: Presentation game play implemented
- 25.01.: Presentation “final” game (+let’s play video)
- Each time feedback of tutor/me afterwards

Moodle

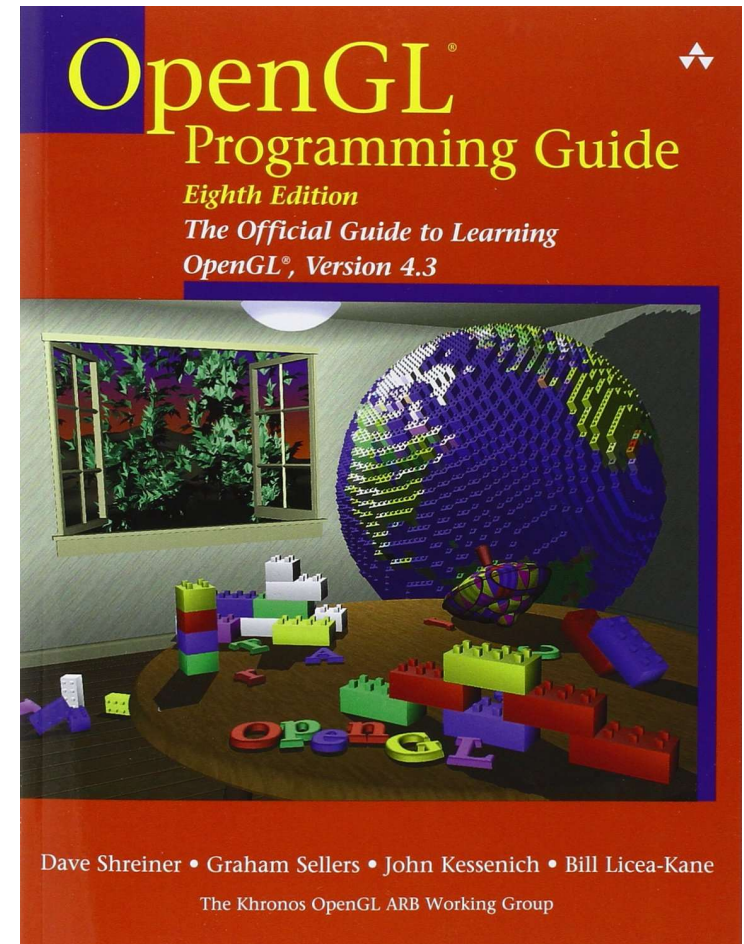
- Deliverable/project upload
- Forums for questions
- Slides
- Examples
- Framework
- ...

Programing framework

- C#
 - Mix of Java and C++
- MS Visual Studio
 - Linux/MacOS guys can use mono, but have to convert final version (a.k.a. upload version)
- Graphics: OpenGL graphics API (many details later)
 - OpenTK
 - C# wrapper for OpenGL
- Sound: Irrklang
- Additional libs check with me first

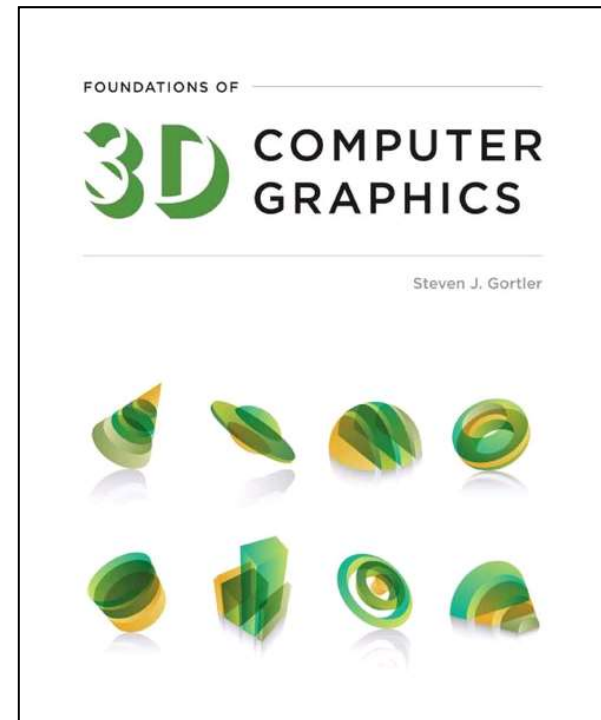
Books on OpenGL

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



Books

- 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

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