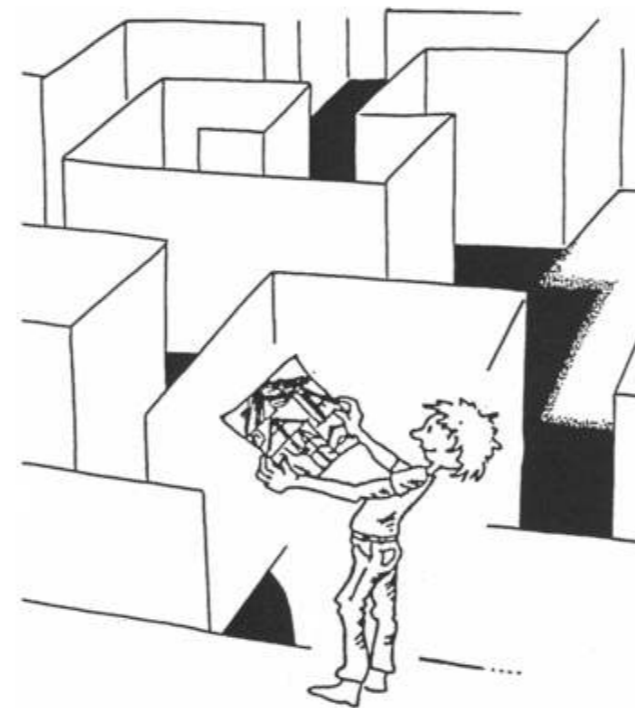


Advanced Computer Graphics (CG2)

Organization



G. Zachmann
University of Bremen, Germany
cgvr.cs.uni-bremen.de

Helpful Pre-Existing Knowledge and Expertise

- Theoretical knowledge:
 - Computer Graphics I (Bachelor)
 - Should you have missed it – you can find the slides at <http://cgvr.cs.uni-bremen.de/> → "Teaching" → "Computer Graphics"
 - Mathematical knowledge: just the very basics
 - Don't be afraid of the occasional equation :-)
 - Appreciation of *algorithmic thinking* in general
- Programming skills:
 - A little bit of C/C++ (actually, just "C with classes")
- If you have missed some of it: take the opportunity to learn it! 😊

The Web Page for This Course

- All the important information for this course will be put on the homepage of this course:

<http://cgvr.cs.uni-bremen.de/> → "Teaching" → "Advanced Computer Graphics"

- Slides
- Assignments & frameworks accompanying the programming assignments
- Literature, online documentation
- Etc.

- You have two options:
 1. Regular oral exam, ca. ½ hour per student
 2. Do the assignments, then take the short oral exam (so-called "Fachgespräch"), ca. 15 minutes per student
- The formula for calculating your grade with option 2:
 - Assignments → grade A
 - 95% of all points → $A = 1.0$, 50% of all points → $A = 4.0$
 - Short oral exam → grade B
 - Overall grade = $\min\left\{\frac{1}{2} \cdot (A + B), B\right\}$ ("min" means "better of the two")
 - Under the condition: $A \geq 4.0$ && $B \geq 4.0$!
- *Note: in both cases, all of the material could be topics for the exam!*

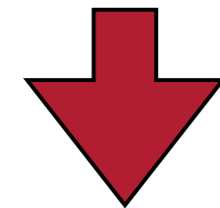
Assignments & Exercises

- First lab meeting: next Thursday
- Then every two weeks *on average*
- Approximately 6 assignments per semester
- Mostly programming within given skeleton programs (just a few LoC from you)
- Try to do the exercises in groups of size 2-3 (exceptions on demand)
- Please register in StudIP!
- Ask on discord! : <https://discord.gg/YGUZFxf> (**CGVRUniBremen**)

High-Level Goals of This Course

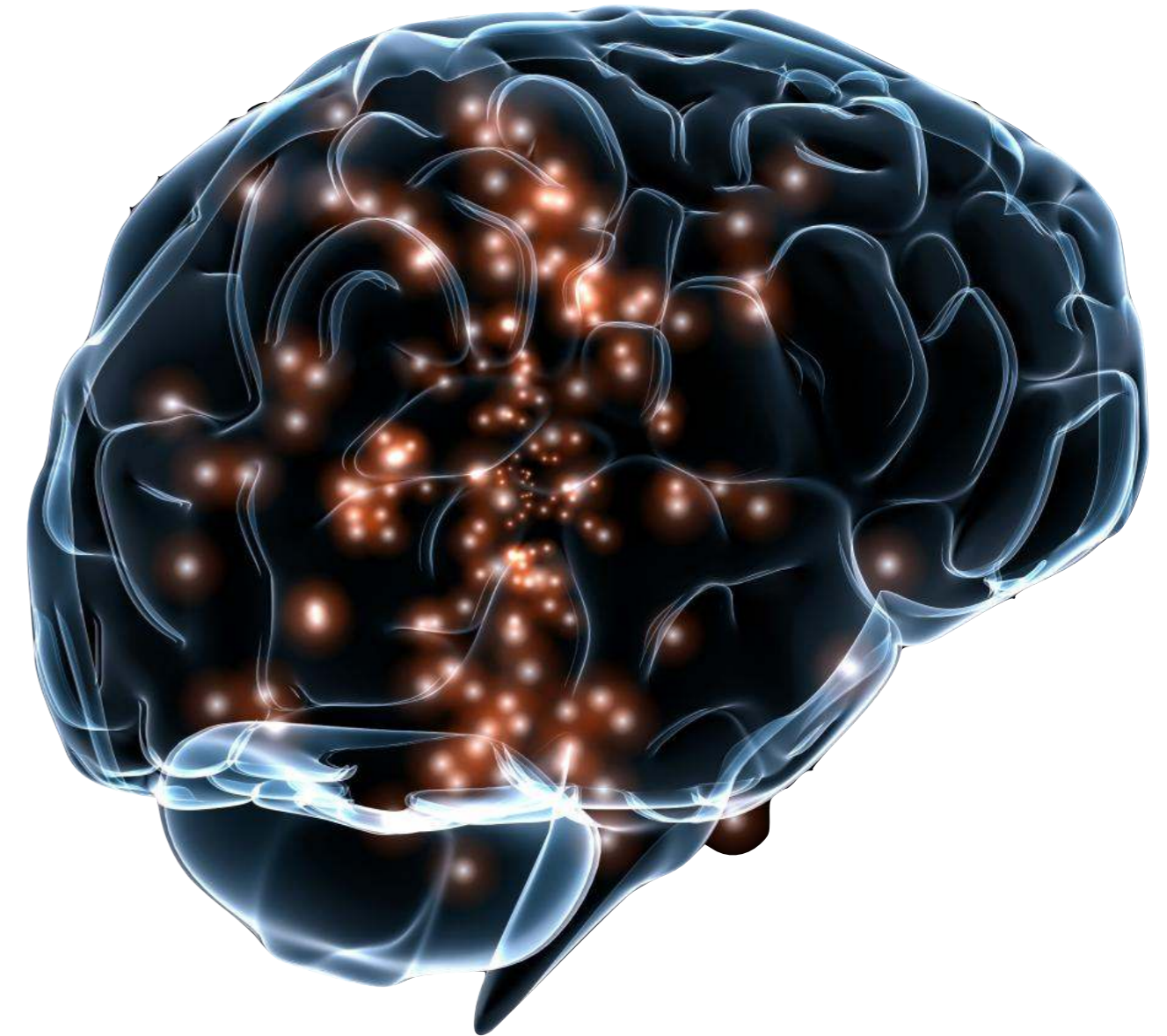
Cognitive Processes

"Enablement"

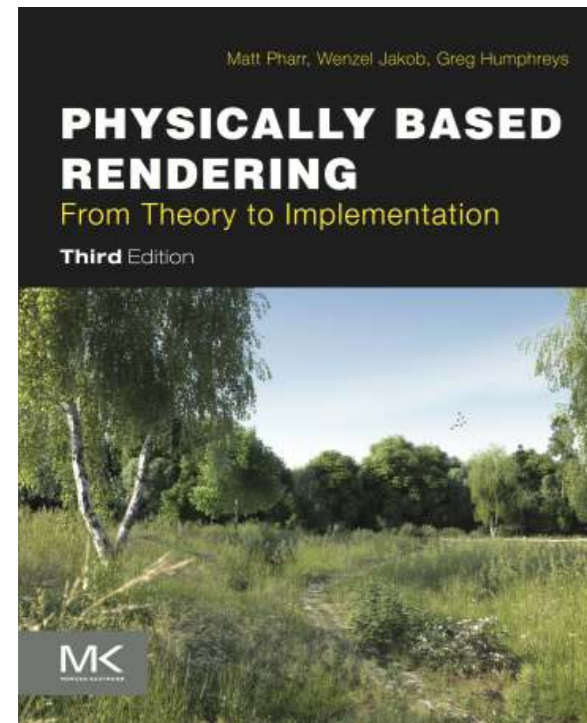


"Empowerment"

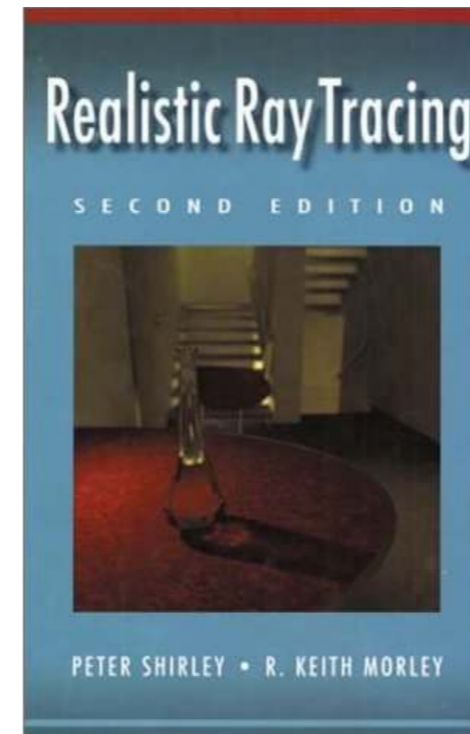
Remember
 Understand
 Apply
 Analyze
 Evaluate
 Create



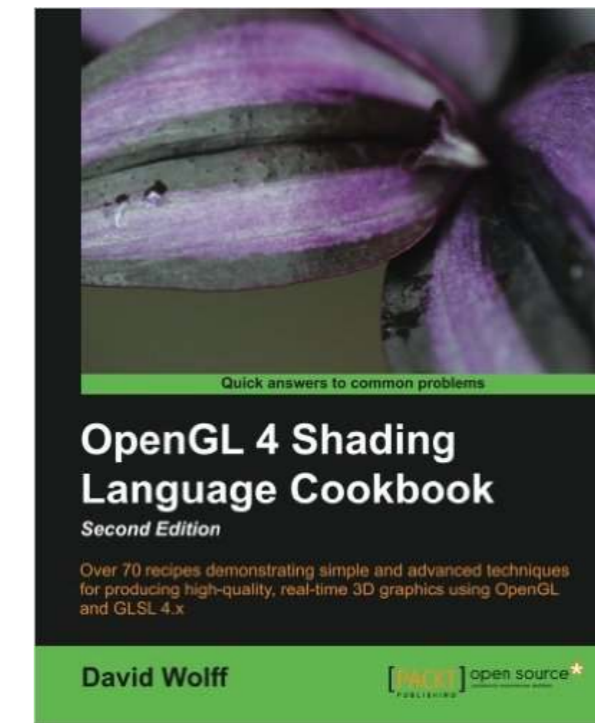
Textbooks For *Some* Topics of Advanced Computer Graphics



Matt Pharr,
Greg Humphrey:
Physically Based
Rendering.
Morgan
Kaufmann.



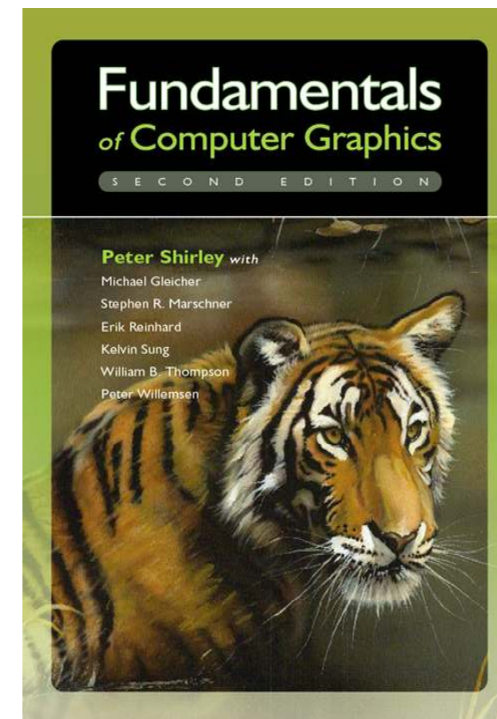
Peter Shirley:
Realistic Ray
Tracing.
AK Peters



David Wolff:
OpenGL 4
Shading
Language
Cookbook.
Packt
Publishing.



Tomas Akenine-
Möller, Eric
Haines: Real-Time
Rendering.
AK Peters



Peter Shirley:
Fundamentals
of Computer
Graphics.
AK Peters

**See also the
documents on
the homepage
of this course!**

What Lies Ahead (Tentative)

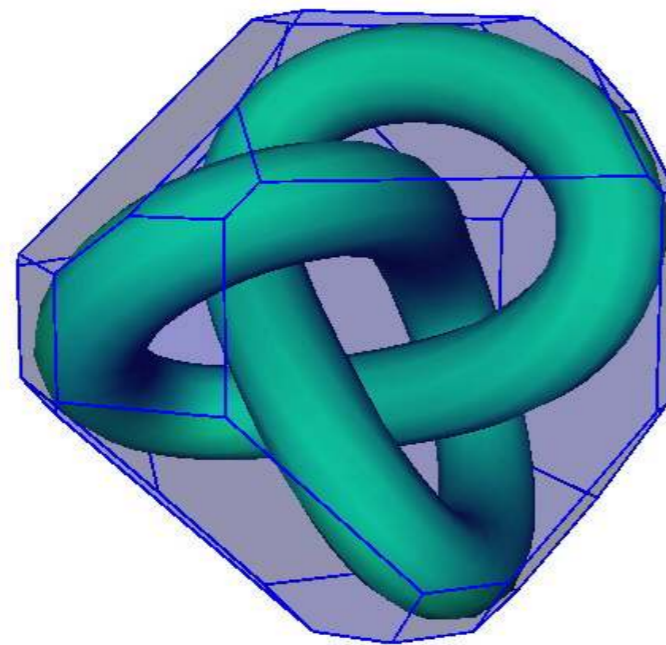
Ray Tracing



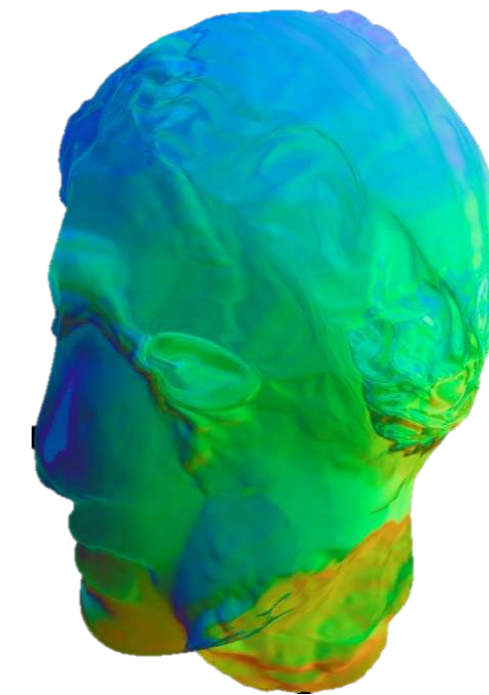
Modeling



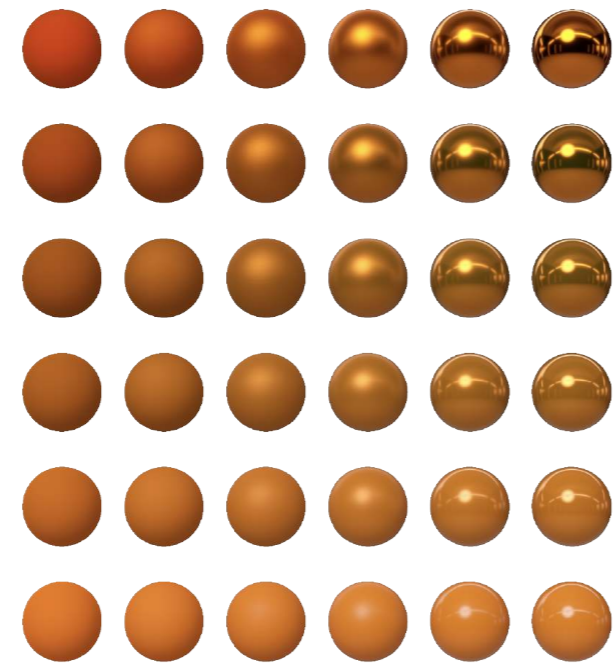
Acceleration
Data Structures



Advanced Shader
Techniques



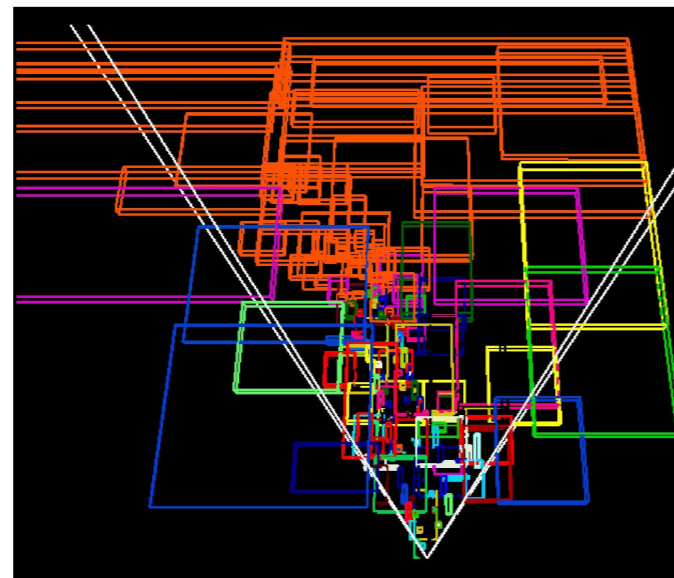
Physically-based rendering



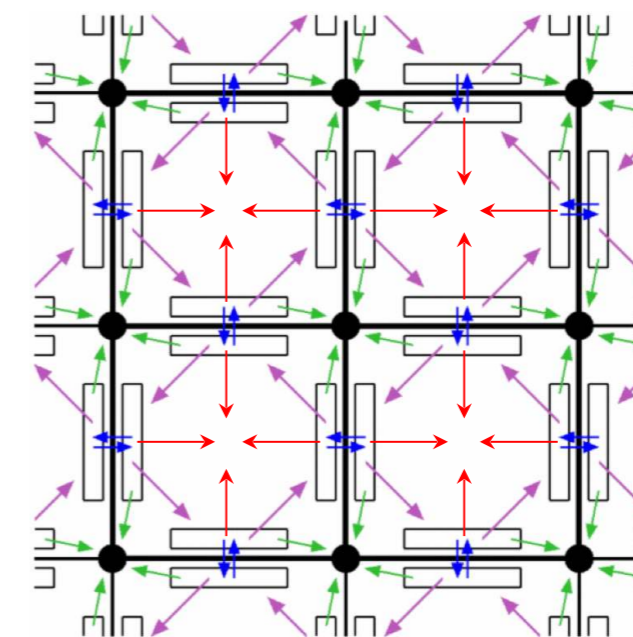
Advanced Texturing



Real-Time Rendering



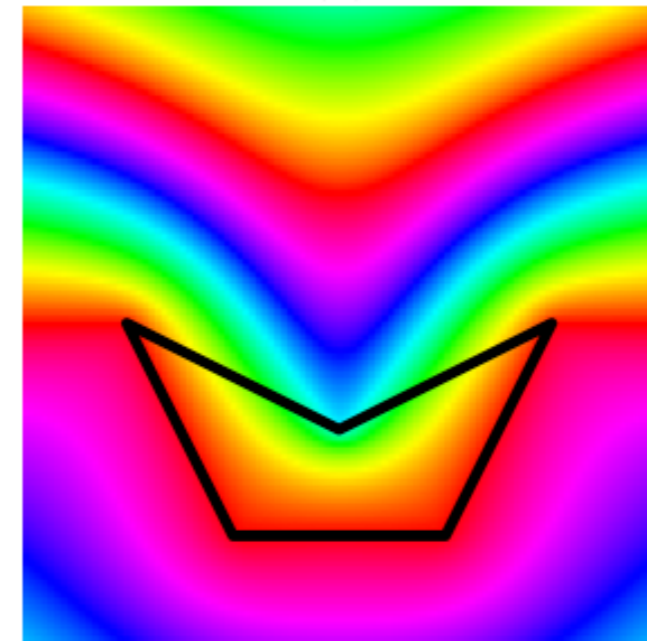
Boundary Representations



Mesh Processing



Generalized Barycentric Coordinates



[More ...]