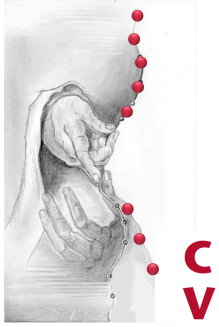
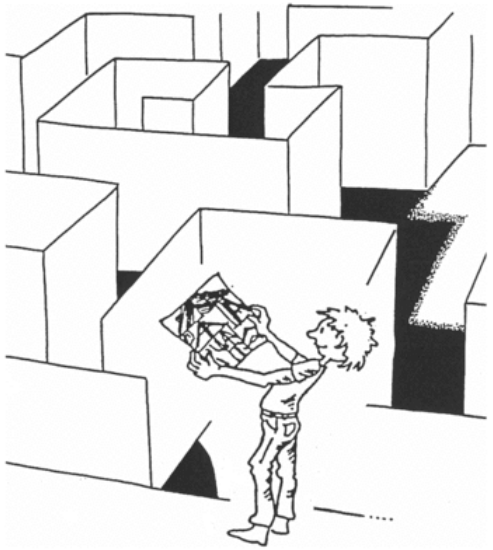
Bremen



CG VR

Advanced Computer Graphics
Organization



G. Zachmann

University of Bremen, Germany

cgvr.informatik.uni-bremen.de

Prerequisites

- 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"
- Liking for *algorithmic thinking* in general
- Programming skills:
  - A little bit of C/C++ (actually, just "C with classes")
- Mathematical knowledge:
  - Only very little

The Web Page for This Class

- All 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.

Grades & Examinations

- You have two options:
  - Either, regular oral exam, ca. ½ hour per student
  - Or, mini oral exam (so-called "Fachgespräch"), ca. 10 minutes per student

- The formula for calculation of your grade with option 2:
  - Assignments ⟶ grade A
    - 95% of all points ⟶ A = 1.0
    - 40% of all points ⟶ A = 4.0
  - Mini oral exam ⟶ grade B
  - Overall grade = 0.5 × A + 0.5 × B
  - Under the condition: A ≥ 4.0 && B ≥ 4.0 !

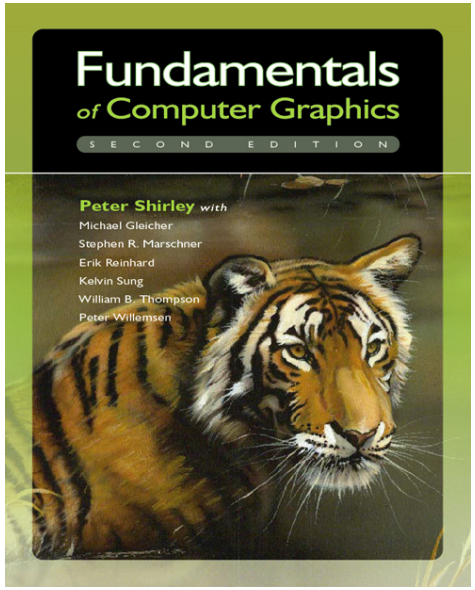
Lab Meetings & Assignments

- First lab meeting: April 30 (next Wednesday)
- First assignment (easy one): out today/tomorrow, due April 29
- Then bi-weekly *on average*
- About 6 assignments per semester, or a mini-project
  - Talk to the teaching assistant, if interested in the second option
- Mostly programming within given framework (just a few LoC)
- Try to do the exercises in groups of size 1...3

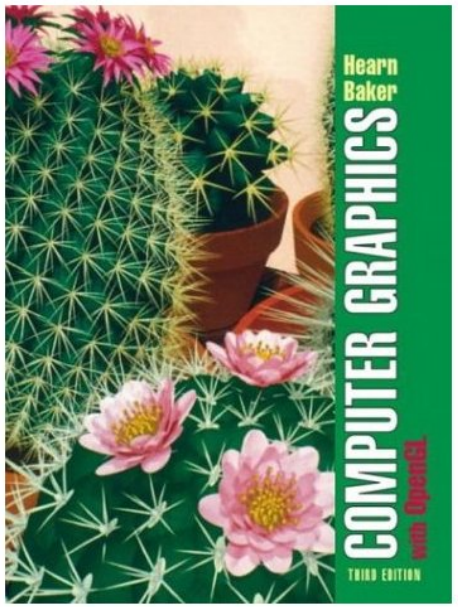
- Please register in StudIP!

Textbooks as of CG1

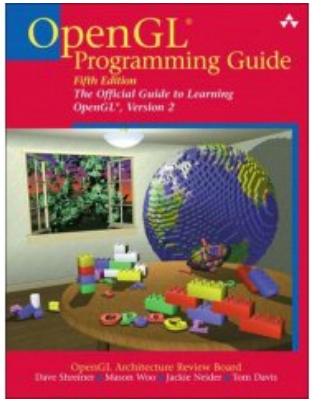
- Peter Shirley: *Fundamentals of Computer Graphics*. AK Peters LTD, Second Edition 2005



- Donald Hearn, M. Pauline Baker: *Computer Graphics with OpenGL*. 3rd Edition, Prentice Hall, 2003

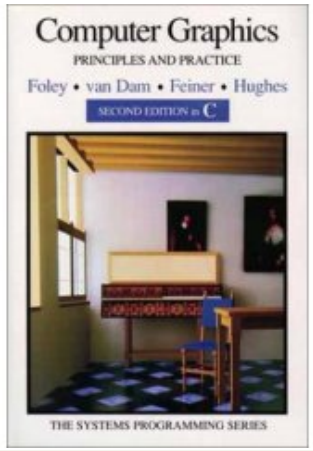


- Mason Woo, Jackie Neider, Tom Davis, Dave Shreiner: *OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 2*. 5th Edition, Addison-Wesley, 2005



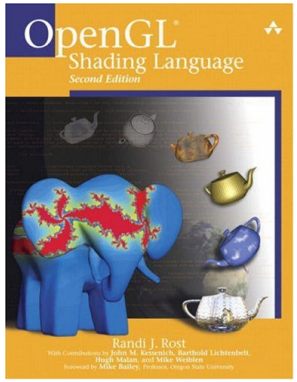
- J. L. Encarnação, W. Strasser, R. Klein: *Graphische Datenverarbeitung 1 und 2.* Oldenbourg, 1996

- J. Foley, A. van Dam, S. Feiner, J. Hughes: *Computer Graphics: Principles and Practice*. Addison-Wesley Professional; 2nd Edition, 1995



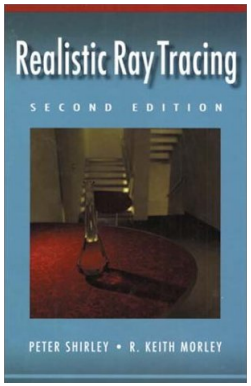
For *Some* Topics of Advanced Computer Graphics

- Randi J. Rost: *OpenGL Shading Language.*
  Addison Wesley, 2004
  S.a.: http://www.opengl.org/documentation/glsl/



- Matt Pharr, Greg Humphrey: *Physically Based Rendering : From Theory to Implementation.*
  Morgan Kaufmann, 2004.
  S.a.: http://www.pbrt.org/

- Peter Shirley: *Realistic Ray Tracing.* AK Peters

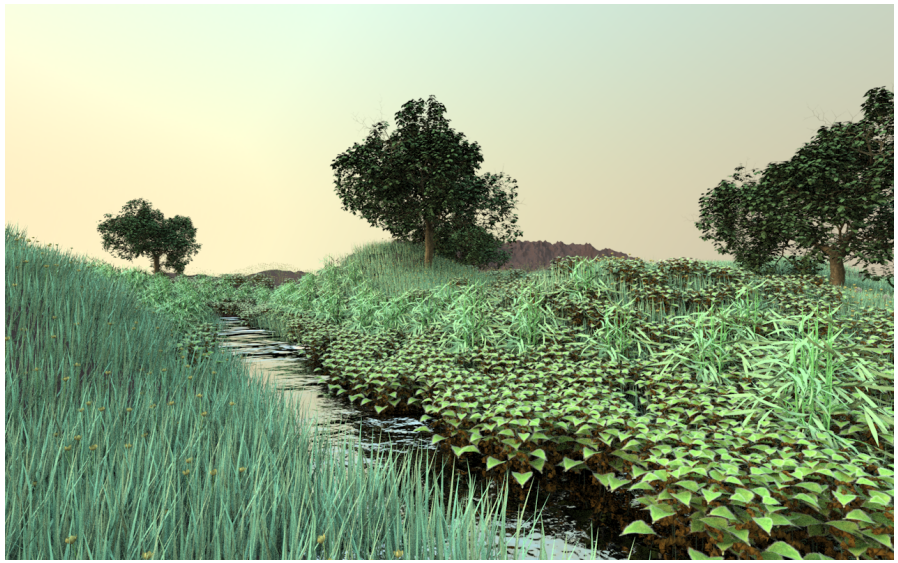


- See the links on the homepage of the course!

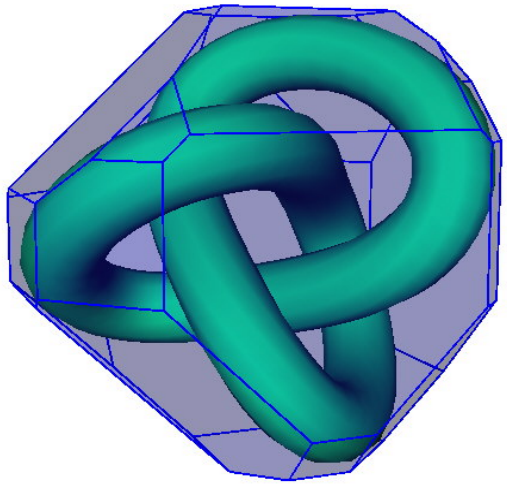
What Lies Ahead (Tentative)

Ray Tracing

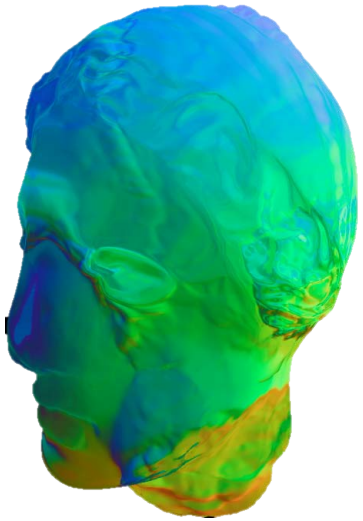
Modeling



Acceleration Data Structures



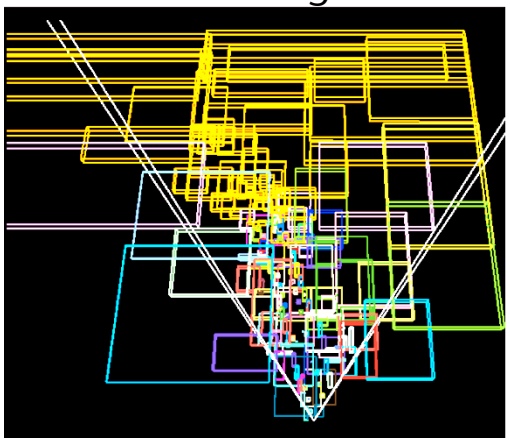
Advanced Shader Techniques



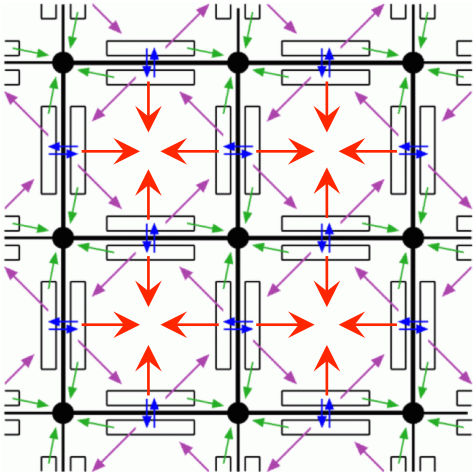
Tone Mapping

Advanced Texturing

Culling



Boundary Representations



Striping

Generalized Barycentric Coordinates