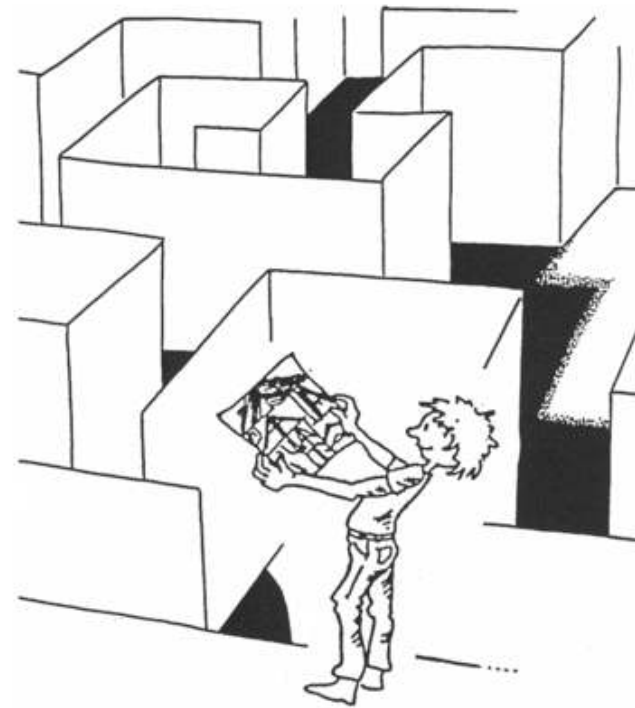




Advanced Computer Graphics (CG2)

Organization



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

Helpful Pre-Existing Knowledge and Expertise

- Theoretical knowledge:
 - Introduction to Computer Graphics (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 of your first semester
 - 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.

Grades & Examinations

- In an era of ChatGPT (LLMs), there is only one option: no more grading of programming assignments
- Consequently: the oral exam will be the only grade
- Oral exam = 20-30 min per student
- Programming assignments are optional, but still highly recommended!

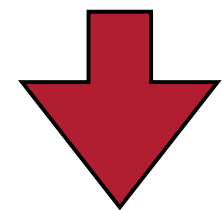
Assignments

- 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 (or just by yourself)
- Please register in StudIP!
- Ask on discord! : <https://discord.gg/YGUZFxf> (**CGVRUniBremen**)

High-Level Goals of This Course

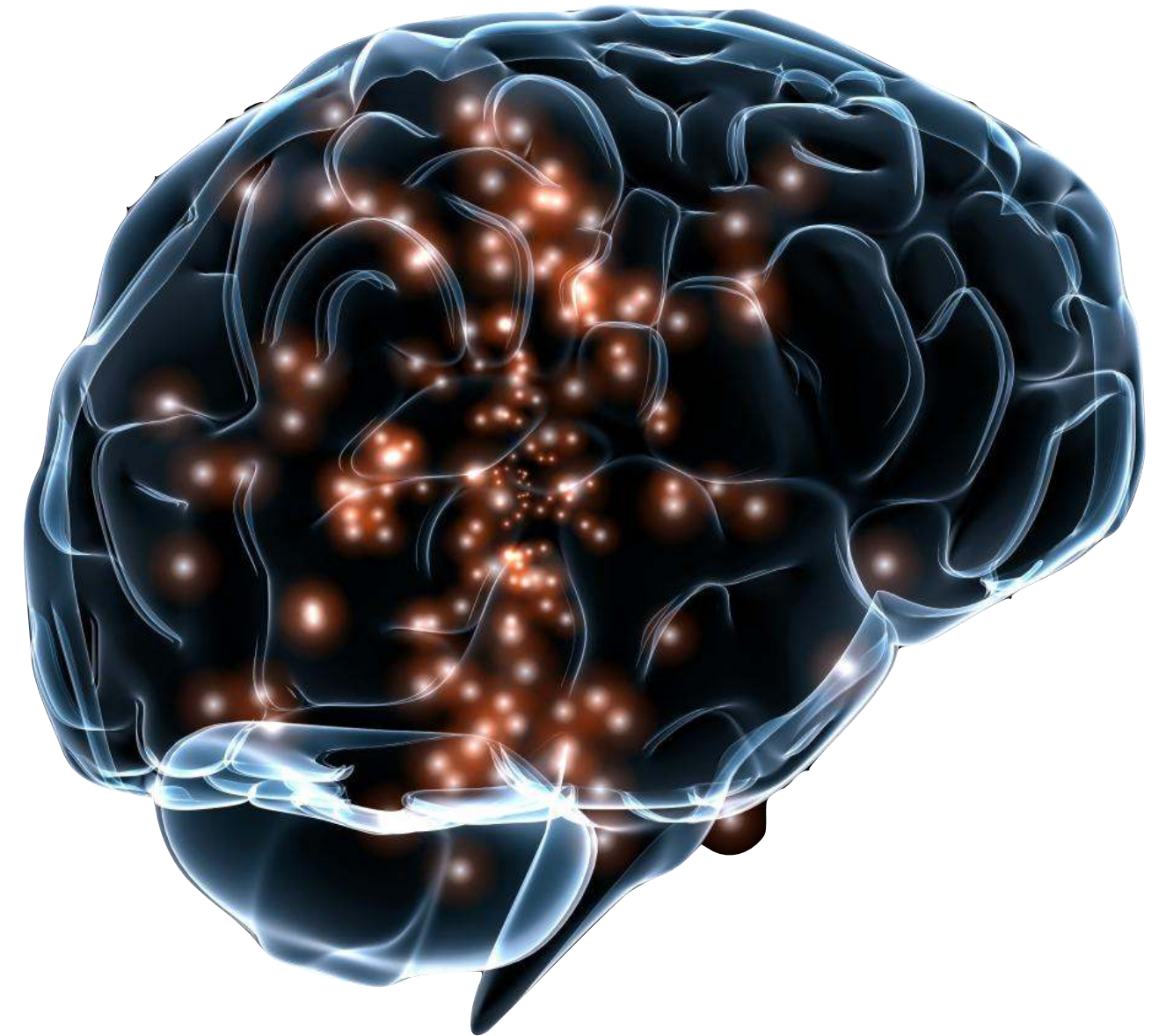
Cognitive Processes (Bloom)

"Enablement"

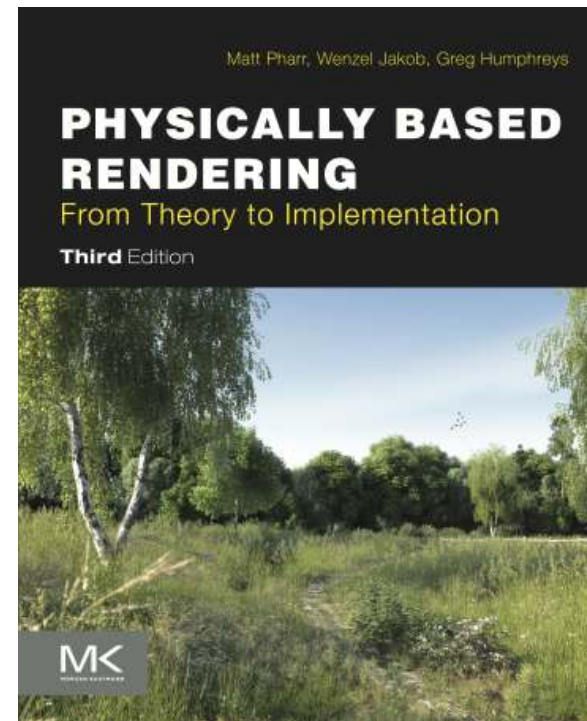


"Empowerment"

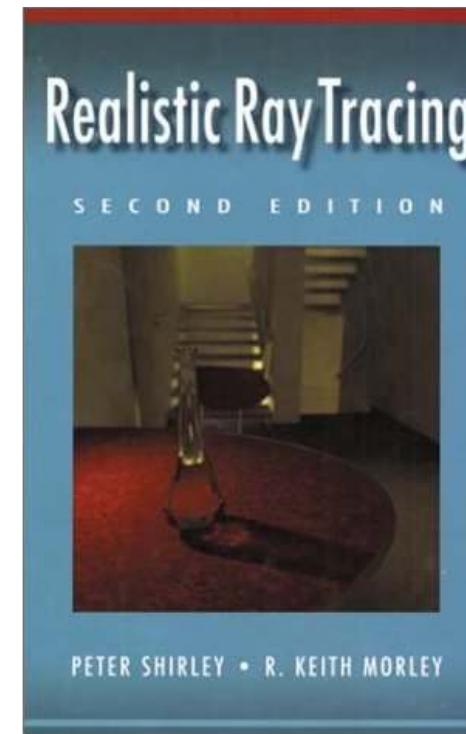
Remember
Understand
Apply
Analyze
Evaluate
Create



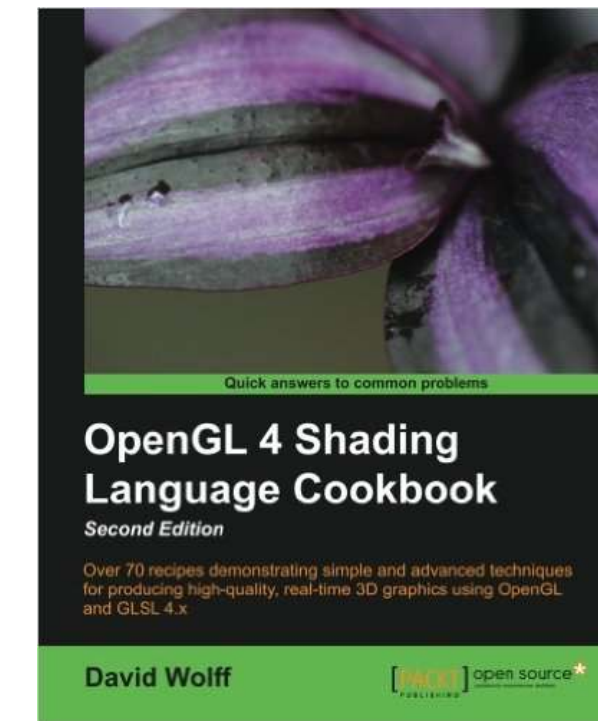
Textbooks For *Some* Topics of Advanced Computer Graphics



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



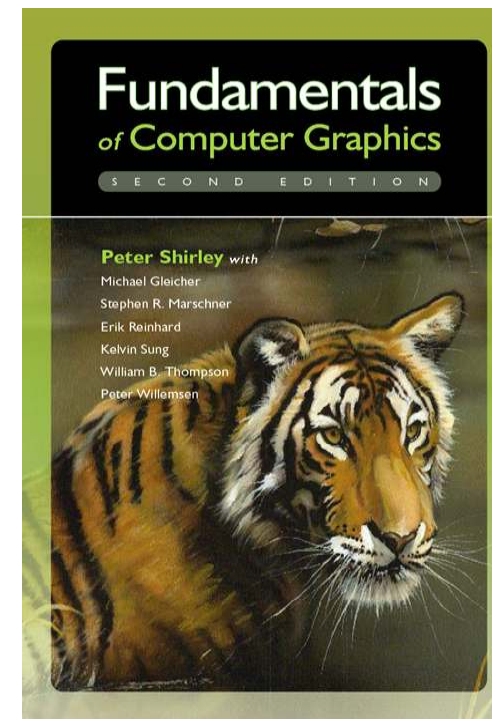
Peter Shirley:
Realistic Ray
Tracing.
AK Peters



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



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

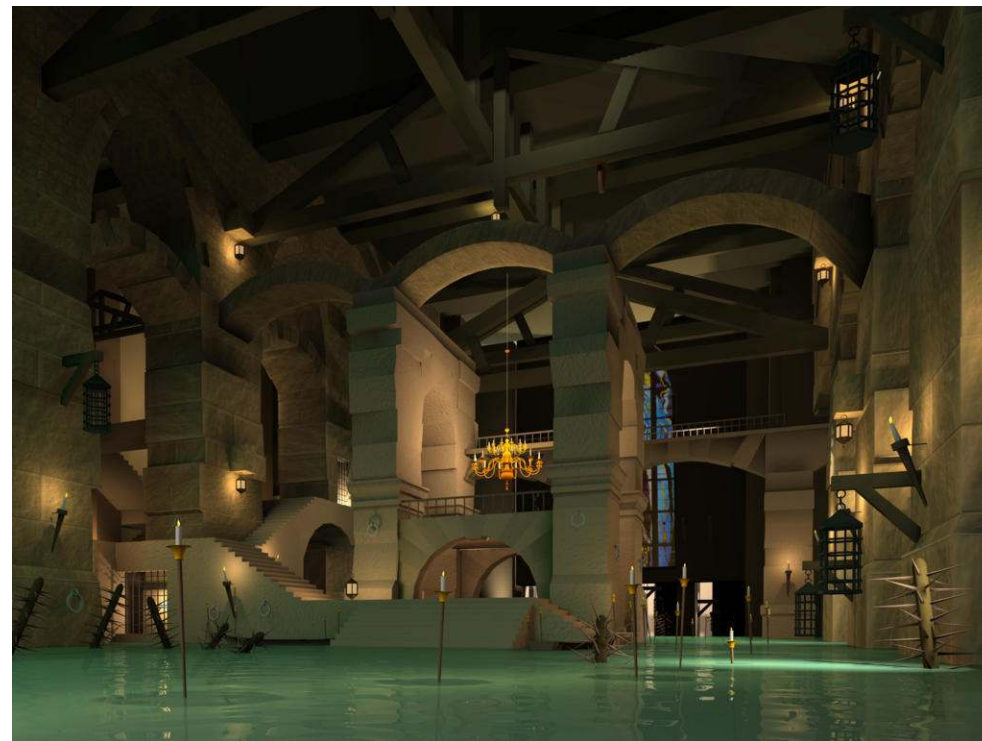


Peter Shirley:
Fundamentals
of Computer
Graphics.
AK Peters

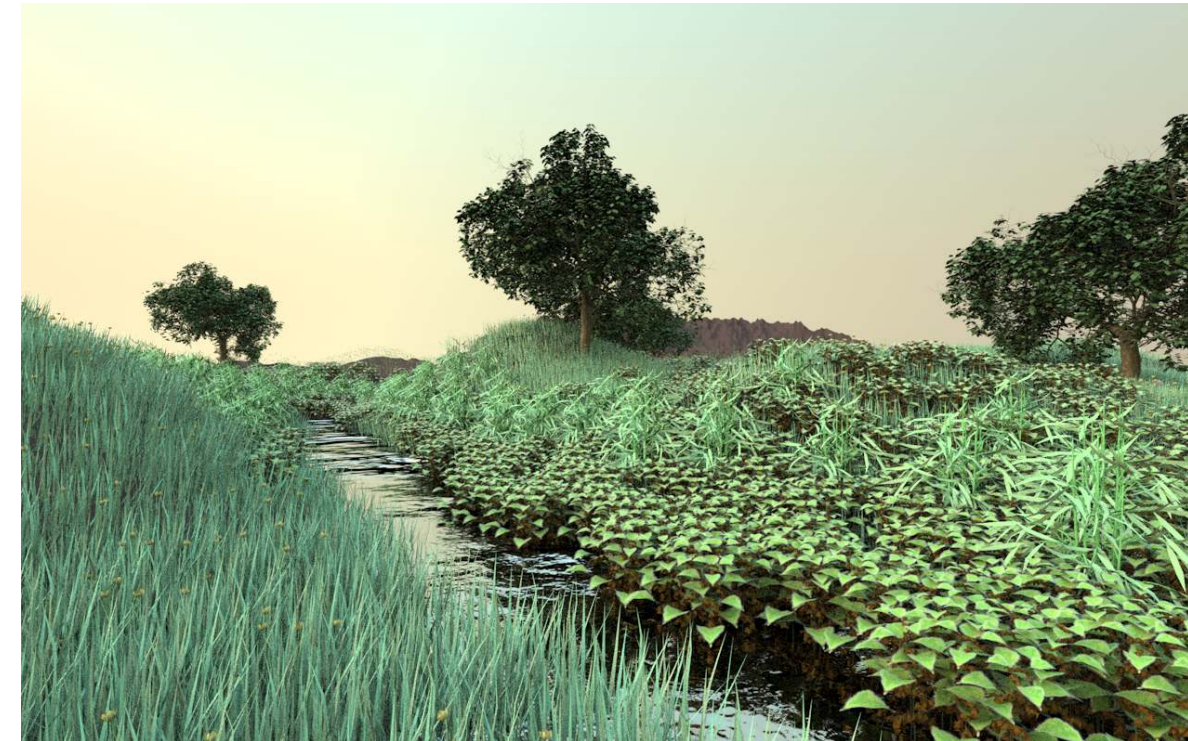
**See also the
documents on
the homepage
of this course!**

What Lies Ahead (Tentative)

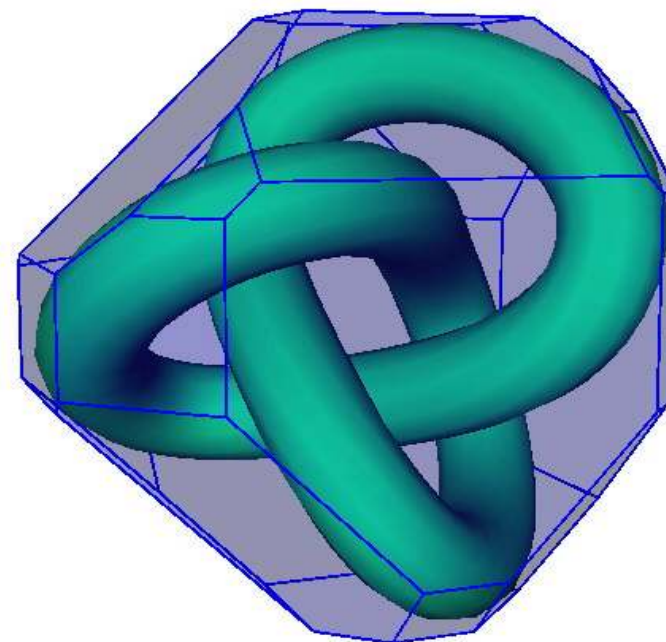
Ray Tracing



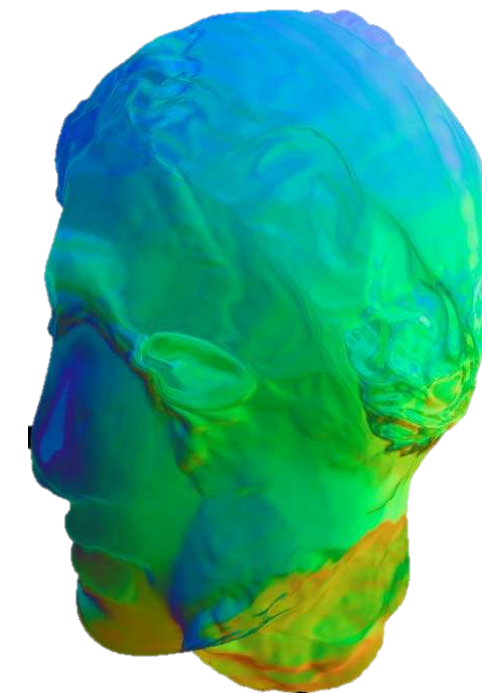
Model
Representations



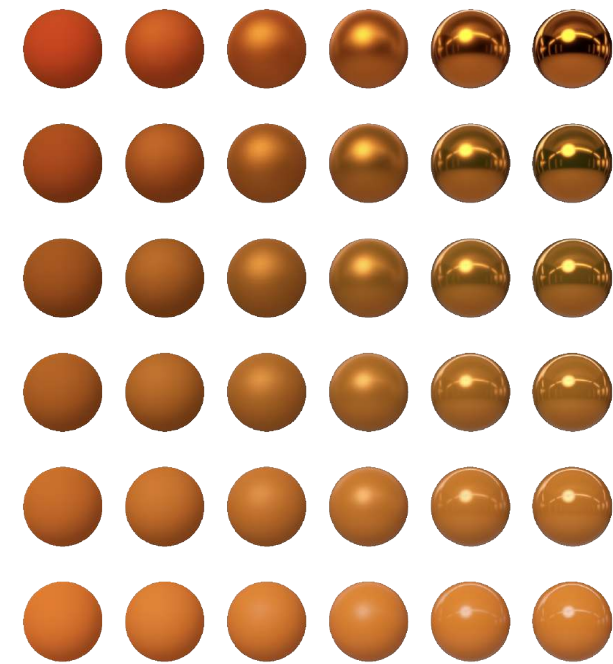
Acceleration
Data Structures



Advanced Shader
Techniques



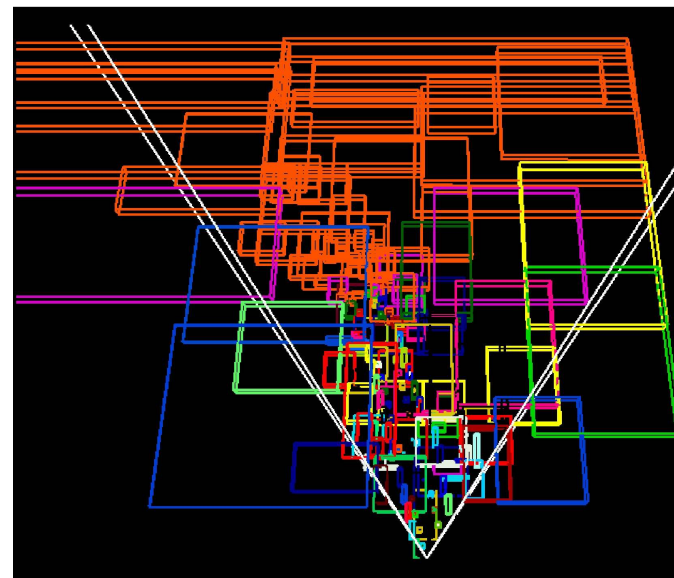
Physically-based rendering



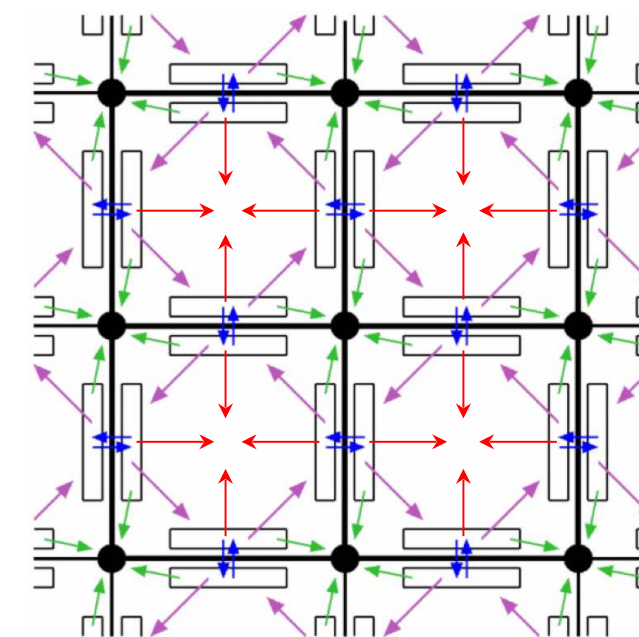
Advanced Texturing



Real-Time Rendering



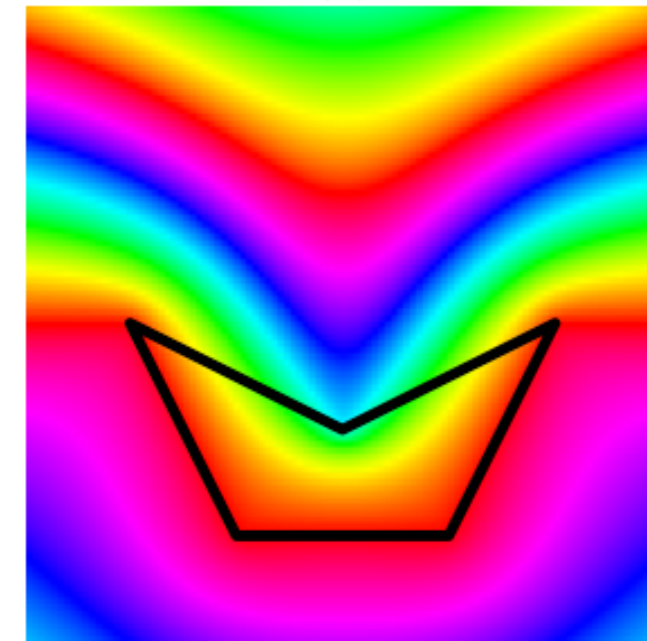
Boundary Representations



Mesh Processing



Generalized Barycentric Coordinates



[More ...]