Seminar aus Computergraphik 186.175, WS 2016/17, 2.0h (3 ECTS)

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Important!

Register to course in TISS: to get news & updates

These slides will on the website after this meeting

Official registration: by submitting the literature list

Topics are presented and assigned here today

Seminar Goals

Practice selecting, reading and understanding

- Search and select papers relevant to your topic
- Summarize them as a state-of-the-art report
- Prepare a talk about your topic in the seminar

This permits in-depth familiarization with the topic

- Submit a literature list (chosen with supervisor)

- Attendance of 3 lectures

- Meetings with supervisor: paper selection, discussion of papers, preparing talk slides

- Alternative: evaluate and compare algorithms

- Final talk in seminar

Literature List

- Analyze recent papers (select with supervisor)
- Study secondary literature to understand topic
- How to find relevant papers:
- SIGGRAPH Proceedings
- Google Scholar: find the right key words
- Survey papers, often-referenced papers
- Submits a list of 10+ papers per email to supervisor & me → official registration

State-of-the-Art Report (STAR)

- 8 pages per student, preferably in english

- Format in the style of a scientific paper

- Use LaTeX template on course website

- LaTeX tools and guides also on the website

- Submit the draft in PDF format, per email to supervisor+organizer

Scientific Review

- You will get a draft of another student to review

- Typical conference review form (Eurographics)

- This helps author to improve the manuscript

- Guides on review writing on course website

- You will receive 2 reviews (student, supervisor)

- Improve final report according to reviews

Seminar Talk

- Prepare slides in advance, using template
- Each student talks for 15 minutes, english pref.
- 5 minutes discussion after each talk
- Focus is on overview/comparison of methods
- Present so that other students will understand it
- Active discussion is mandatory and is graded
- Submitted slides are presented on seminar PC

- Lecture attendance 5%

- Review: 20%

- Seminar slides+talk: 30%, discussion 5%

- Final report: 40%

- Late submission: 15% off per day, max. 1 week

Important Dates

- 26.10. 23:59 Submit literature list (email to me)
- 13.10. 15:00 – 17:00 Lecture Prof. Wimmer
- 09.11. 13:00 – 15:00 Lecture Prof. Gröller
- 30.11. 13:00 – 15:00 Lecture Prof. Purgathofer
- 07.12. 23:59 Submit report draft
- 21.12. 23:59 Submit review
- 22.01. 23:59 Submit slides (per email)
- 23.01. 10:00 – 18:00 Seminar talks
- 23.01. 23:59 Submit final report

- Now 18 topics will be presented

- After the presentation, please mark down at least 3 in order of preference (1, 2, 3, …)

- I will try to make a fair assignment of topics
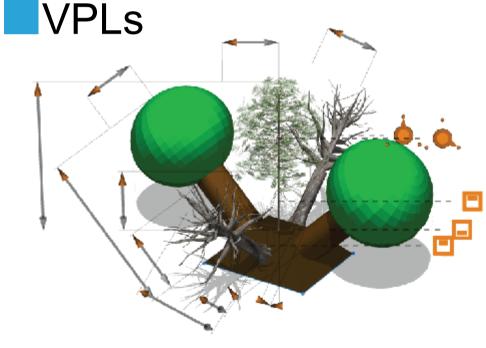
Grammar-based modeling = programing.

How to change it?

- Handles
- Node editors
- VPLs

Input --> Split01

Split01 --> split(x,adjust)
{ 0.5 : All | ~1.0 : Case01 | 0.5 : All }

Case01 --> case scope.sx > 1 :
Split02
translate(rel,scope,0.0,0.0,1)
Split01
else:
Split02

Split02 --> split(x,adjust)
{ 1.0 : load("assets/woodLog.obj") }*

Martin Ilcik

TU
WIEN
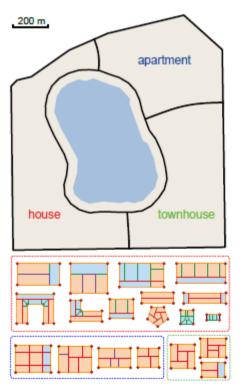
■ Multi-scale

■ Constraints

■ Optimization

Martin Ilcik

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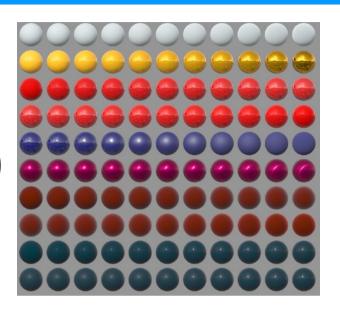
■ Investigate physically based illumination models for games

◆ Microfacet BRDFs

◆ Image-based lighting
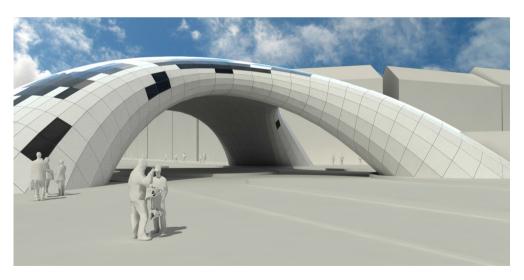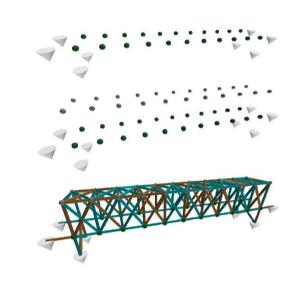
Conduct a survey of recent advances in

◼ Structural optimization for buildings/bridges etc.
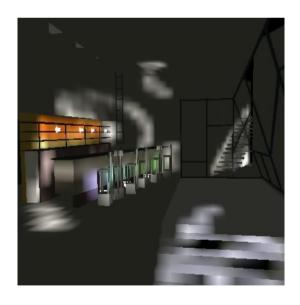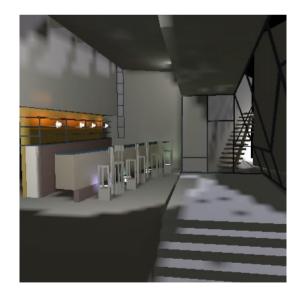
◼ Modelling of plausible buildings

- Solve the Inverse Lighting Problem for 3D Scenes
- Light Painting
- Sketch Based Lighting

Lin, Wen-Chieh, et al. "Interactive lighting design with hierarchical light representation." *Computer Graphics Forum*. Vol. 32. No. 4. Blackwell Publishing Ltd, 2013.
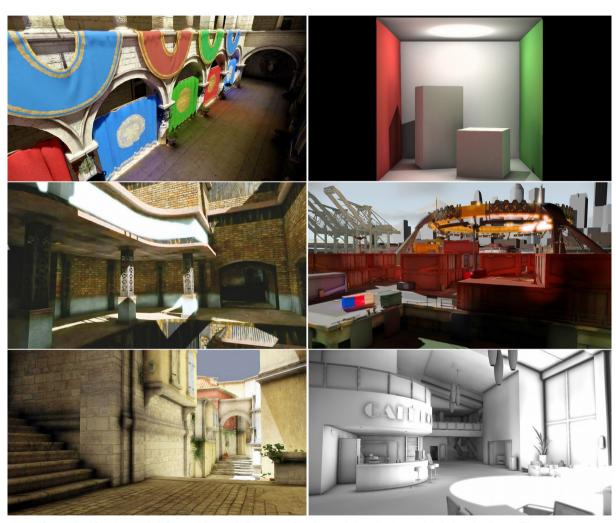

Katharina Krösl

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- Radiosity
- Raytracing
- Quality versus Speed
- GPU methods

Crassin, Cyril, et al. "CloudLight: A System for Amortizing Indirect Lighting in Real-Time Rendering." *Journal of Computer Graphics Techniques* Vol 4.4 (2015).

Katharina Krösl

Conduct a survey of recent advances in the acceleration of ray tracing

Christian Freude

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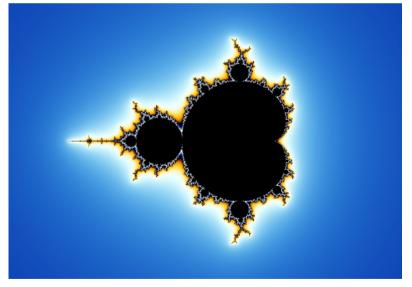Conduct a survey of recent advances in real-time non-photorealistic rendering

Christian Freude

- Fractal Geometry
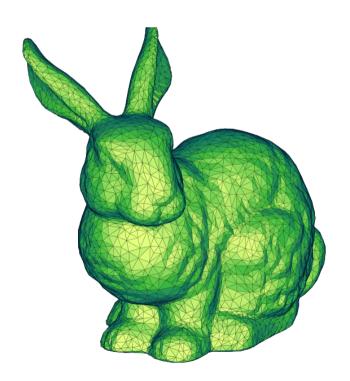- State-of-the-art methods to improve speed
- Comparison with other image compression techniques

- Compare state-of-the-art algorithms
- Evaluate pros and cons of different approaches
- Will improve knowledge in:
  - Computational Geometry
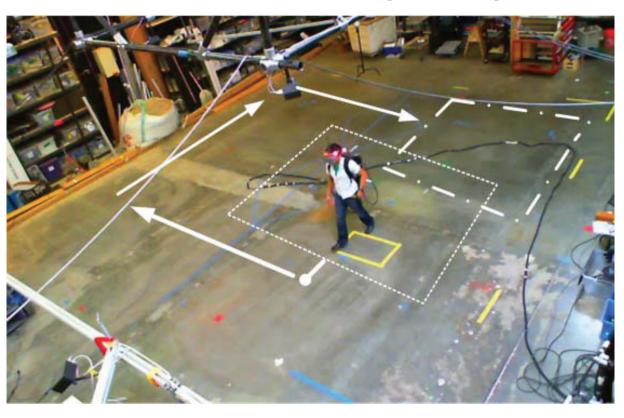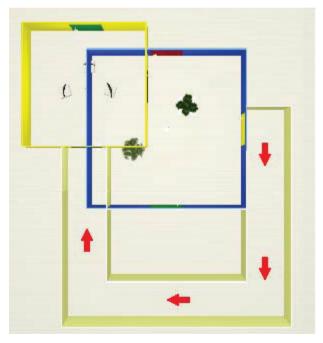 - Computer Graphics!

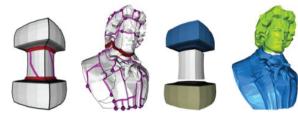- How virtual spaces are formed with respect to real space
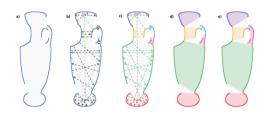- Effects on human perception
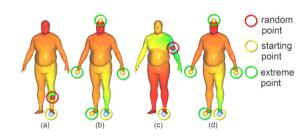
Conduct a survey of convex decomposition methods.

Pocket cuts [Lien et al 2007]

Lines of sight [Kaick et al 2014]

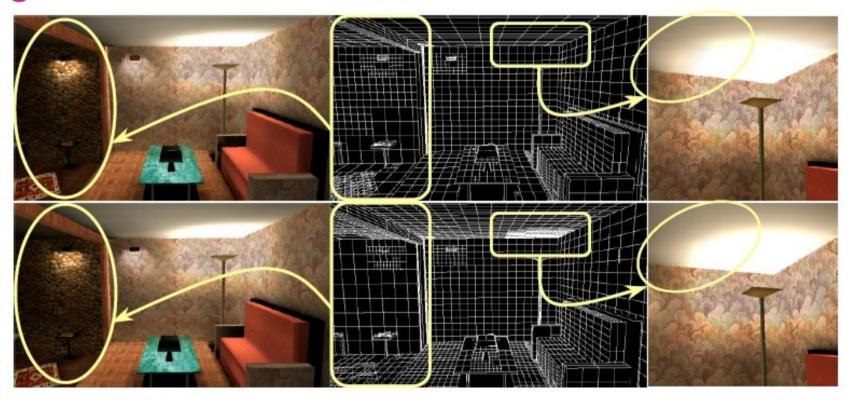Concavity aware fields [Au et al 2012]

Mohamed Radwan

■ Write a state-of-the-art report about methods that exploit perceptual aspects for rendering global illumination
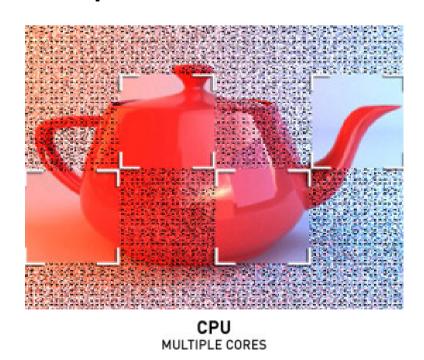

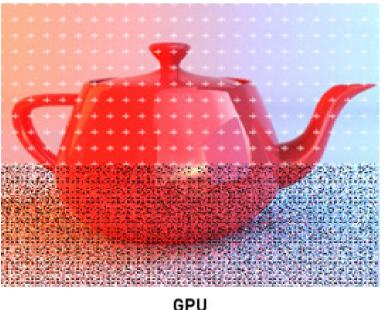No visible difference   Perceptible artifacts

Hiroyuki Sakai

■ Write an overview of current GPU ray tracing solutions

■ Consider advantages and disadvantages compared to CPU methods

CPU
MULTIPLE CORES
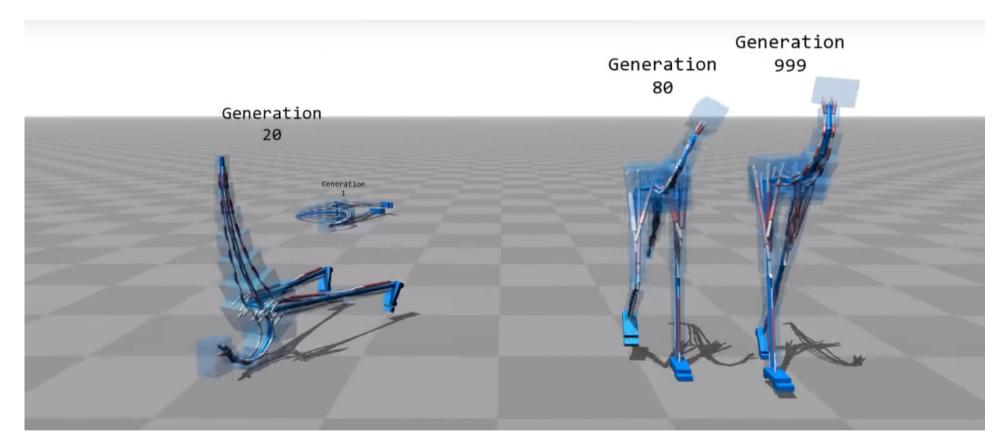
GPU
THOUSANDS OF CORES

Hiroyuki Sakai

Reinforcement learning is an amazing tool for optimizing the behavior of an agent in an enviroment. It is capable of playing computer games at a high level and also has applications in computer graphics. Check this out.

Károly Zsolnai-Fehér

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Neural networks are universal function approximators that are used to solve difficult problems in image and speech recognition, image synthesis, and many more. Check this out and see for yourself!

Károly Zsolnai-Fehér

Smartphones can soon take RGBD images.
Can depth segmentation correct these errors?

depth-of-field   perspective   overexposure

360°-photos are nowadays easy to generate.

How about more complex scenes, using depth?

Stefan Ohrhallinger

Topic Assignment

- Please mark at least 3 topics in order of preference (1, 2, 3, …), with your name

- Hand in the sheet

- Then I will assign the topics on the spot

Questions?

- Get in contact with your supervisor ASAP

- Discuss literature list with your supervisor

- Submit the list (to me and supervisor) per email by 26.10.