Seminar aus Computergraphik
186.175, WS 2017/18, 2.0h (3 ECTS)

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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
Tasks

- 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
Grading

- 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

- 25.10. 23:59 Submit literature list (per email)
- 10.11. 14:00 – 16:00 Lecture Prof. Wimmer
- 23.11. 13:00 – 15:00 Lecture Prof. Gröller
- 29.11. 13:00 – 15:00 Lecture Prof. Purgathofer
- 04.12. 23:59 Submit report draft
- 18.12. 23:59 Submit review
- 24.01. 23:59 Submit slides
- 25.01. 09:00 – 13:00 Seminar talks
- 25.01. 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
1 Light Painting for Lighting Design

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


Katharina Krösl
2 Real-time Global Illumination

- Radiosity
- Raytracing
- Quality versus Speed
- GPU methods


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

Károly Zsolnai-Fehér
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
Conduct a survey of shape segmentation methods.
6 Shape Approximation

- Mesh simplification
- MAT, CSG
- Bounding volumes
- Sphere meshes
- Bounding proxies


Mohamed Radwan
Detailed 3D models require a lot of space.

Investigate 3D model compression techniques and their advantages (disk usage, load times, ...)

Markus Schütz
Some models are too large to be loaded and rendered as a whole

LOD structures allow you to load and render only the essential parts of a model (or map)
Investigate how GPUs perform rasterization
- Tile-Based Rasterization
- Efficient Memory Patterns

Bounding Box of T

Bernhard Steiner
Survey about Bending Active Structures
- Design Methods
- Form Finding
provide an chronological overview of real-time global illumination techniques
provide an overview of techniques that can render specialized effects such as phosphorescence, fluorescence, chromatic aberration, lens flare, etc.
13 Point Cloud Registration

- Merge laser scans
- Match overlapping areas
- Problem: sampling artifacts

Philipp Erler
14 Level-of-Detail Systems for Meshes

- Render only the necessary
- Increase performance
- Popping Artifacts

- 69,451 polys
- 2,502 polys
- 251 polys
- 76 polys

Philipp Erler
15 Position-Based Simulation Methods

- Position-Based Dynamics
- Set of particles connected by constraints
- Stable two-way interaction of all object types
  - Cloth
  - Deformables
  - Liquids
  - Gases
  - Rigid Bodies

Johannes Unterguggenberger
State of the art report about real-time fluid simulation techniques

- Position-Based Fluids
- Fluid-Implicit-Particle methods
- Data-Driven Fluid Simulations
- ...

Johannes Unterguggenberger
Conduct a survey on recent advances in rendering for VR.
Conduct a survey on image comparison and quality metrics.
• Please mark at least 3 topics in order of preference (1, 2, 3, …), with your name, email and student number
• 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 both me and supervisor) per email by 25.10.