

Seminarthemen WS 2019/2020

1. Quaternionen

➔ Animating rotation with quaternion curves (Shoemake)

2. Vertex Blending

➔ Slashing Through Real-Time Character Animation (Game Developer)

3. BRDF Theory

➔ Geometric Considerations and Nomenclature for Reflectance (Nicodemus et al.)

4. Glossy Effects

➔ Multi-pass Pipeline rendering: Realism for dynamic environments (Diefenbach et al.)

5. Shadow Volumes

➔ Shadow Algorithms for Computer Graphics (Crow)

6. Shadow Map

➔ Casting Curved Shadows on Curved Surfaces (Williams)

7. Surface Angle Silhouetting

➔ Interactive Technical Illustration (Gooch et al.)

8. Procedural Geometry Silhouetting

➔ Image Precision Silhouette Edges (Raskar et al.)

9. Line Rendering

➔ Advanced Graphics Programming Techniques using OpenGL course notes (Mc Reynolds et al.)

10. Impostors

→ Imposters: Adding Clutter (Forsyth)

11. BSP Trees

→ The Design and Analysis of Spatial Data Analysis (Samet)

12. Hierarchical z-Buffering

→ Hierarchical z-Buffer Visibility (Greene)

13. HOM Algorithm

→ Visibility Culling using Hierarchical Occlusion Maps (Zhang et al.)

14. Point Rendering

→ The use of points as a Display Primitive (Levoy et al.)

15. Bezier Curves

→ Curves and Surfaces for Computer Aided Geometric Design (Farin)

16. Kochanek-Bartels Curves

→ Interpolating Splines with local tension (Kochanek)

17. N-Patches

→ Curved PN-Triangles (Vlachos)

18. Implicit Surfaces (Blobby Modelling)

→ A Generalization of Algebraic Surface Drawing (Blinn)

19. Catmull-Clark Subdivision

→ Recursively generated B-Spline Surfaces on arbitrary Topological Measures (Catmull et al.)

20. Oriented Bounding Boxes by Gottschalk

→ Collision Queries using oriented Bounding Boxes (Gottschalk)

21. Collision Detection using BSP Trees

→ Dynamic Plane Shifting BSP Traversal (Melax)

22. OBB Tree

→ OBBTree: A hierarchical structure for Rapid Interference Detection (Gottschalk et al.)

23. Front Tracking

→ Efficient Collision Detection for Interactive 3D Graphics and Virtual Environments (Klosowski)

24. GJK Algorithmus

→ A fast procedure for computing the distance between Complex Objects in Three-dimensional space (Gilbert et al.)

25. Deffered Shading

→ <https://learnopengl.com/Advanced-Lighting/Deferred-Shading>

26. GPGPU: Architekturen und APIs

→ Cuda

→ OpenGL

27. Fluidsimulation mit Smoothed Particle Hydrodynamics (SPH)

→ <https://royalsocietypublishing.org/doi/10.1098/rspa.2019.0801>

28. Partikelrendering

→ https://renderman.pixar.com/resources/RenderMan_20/tutorialRenderingParticles.html

29. Berechnung von Optischem Fluss auf GPU

→ <https://developer.nvidia.com/blog/opencv-optical-flow-algorithms-with-nvidia-turing-gpus/>

30. Datenstrukturen auf der GPU

→ <https://developer.nvidia.com/gpugems/gpugems2/part-iv-general-purpose-computation-gpus-primer/chapter-33-implementing-efficient>