Computer Graphics 2021
Exercise 7: Exposee (Project 2)

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Project Requirements

For project 2, you can freely choose a topic within the scope of Computer Graphics and specify the individual working packages.The requirements are as follows:

- The topic needs to be related to the scope of Computer Graphics and Physical Modeling.
- The project contains original implementation in a programming language of your choice.
- Development is done exclusively for Computer Graphics. Resources from other modules/projects (code, models, etc.) can be used, but need to be declared.
- Any available tools (hardware and software) can be used. Projects may contain a tool chain with data transfer between your own modules and external tools.
- Projects need to differ sufficiently from those of the other groups.

Problem 1: Topic (to be discussed in the Laboratory on 06.07.21 using breakout rooms)

Please, find a team of 2 or 3 students (can be the same as in project 1) and prepare some project ideas. What needs to be developed (unique features and novel applications)? What are the challenges? Which parts will be implemented and what can be solved with existing tools? Which outcomes do you expect and how can your prototype be tested?

Problem 2: Exposee (upload by 06.11.21)

The exposee is a PDF document containing the following information:

- Topic. Can be a working title.
- Authors. With the exposee, you commit yourself to develop the project.
- A short description of the project (one paragraph).
- Project goals and methods for evaluation (e.g. how can the development be tested)
- Algorithms to be implemented
- Tools to be used (programming languages, game engines, etc.)
- Working packages (subdivide the project into smaller parts)
- Milestones (which results are expected and when will they be obtained)
- Time table
- Literature

The exposee can be very short, but it may contain some research on related work, algorithms and tools in the scope of the topic chosen. It can be generated with LaTeX. All its contents can be used for the project documentation, later.

Time Table

06.07. discussion of project ideas and preparation of exposees
06.11. exposee upload
06.14. International Week (no CG lecture)
06.28. Intermediate Presentation
07.12. Final Presentation
07.16. Documentation generated with LaTeX

Example Topics

Topics can be chosen form, but are not limited to the following examples:

- Physical simulation of rigid bodies with linear and rotational velocity, based on numerical integration, optionally with collision detection and handling .
- Collision detection for objects composed of freeform surfaces.
- 3D scanning and printing.
- Tracking and navigation with VR or mobile devices.
- Computer animation with rigging (can be done with Blender or Cinema4D) using motion captured data, visualization and analysis.
- Developing video games in OpenGL with optional sound based on OpenAL.
- Serious games facilitating common tasks, for example developed in Unity 3D.
- Acoustic simulation (image sources) or filtering audio signals.
- Simulating and rendering waves on water surfaces.
- Simulating liquids or clouds (e.g. Stable Fluids).
- GPU-based rendering.