

Summer Term 2023

Assignment on Computational Geometry - Sheet 5

Due Date 26. 06. 2023

Due by **26. 06. 2023** via email to weller@informatik.uni-bremen.de)

Exercise 1 (Front-To-Back-Rendering, 7 Credits)

One application for BSP-Trees you know from the lecture is Back-To-Front-Rendering, i.e. realizing the painters algorithm. Please describe an algorithm based on BSPs that implements *Front-To-Back-Rendering*.

Exercise 2 (Layered BVHs, 6 Credits)

According to the definition in the lecture, we call a BVH *layered* if the BV of each node also contains the BVs of all its direct children.

Show that then also each node is a BV for its complete subtree.

Exercise 3 (Wrapped and Layered BVHs, 7 Credits)

Decide for the following BVs, if the tightest fitting BVH is a layered BVH or not. In the case that it actually is a layered BVH, prove it, if the tightest fitting BVH is not a layered BVH, show a counter example where a wrapped hierarchy fits tighter.

The BVs to check are: AABBs, spheres, k-DOPs and OBBs.