

News

28.2.2023.

Q: using height/normal maps for hit/miss geometry

- Tessellation-free displacement mapping: <https://perso.telecom-paristech.fr/boubek/papers/TFDM/>
 - Displacement without need for additional surface geometry
 - Look in related work; chapter 2 for additional methods



Texture atlas

- Optimization idea: having multiple texture images in one image.
- Let's assume that scene contains multiple objects. UV coordinates for all objects must be calculated and for each image texture must be placed using those UV coordinates
 - Image textures of those objects can be stored into one image for memory efficiency → texture atlas
 - Example: <https://www.creativeshrimp.com/game-level-texturing-texture-atlas-part-35.html>
 - Example: https://www.youtube.com/watch?v=Xwv4vPvVju4&ab_channel=AdobeSubstance3D
 - Texture atlas baking example: <https://www.youtube.com/watch?v=-rIANRJMaIs>
- If we are working with complex object, it has to be separated into parts which will have same textures. For those parts, UV coordinates are calculated and image texture is placed using UV coordinates
 - Again, all image texture can be saved into one image → texture atlas
 - Example: https://www.youtube.com/watch?v=gZRDwbHEB34&ab_channel=GrantAbbitt
- Textures on complex object can be 3D painted directly on mesh. Note that UV coordinates for mesh must be calculated before.
 - 3D painting software can store all painted textures per parts as texture atlas
 - Example: https://www.youtube.com/watch?v=WjS_zNQNVlw&ab_channel=GrantAbbitt
 - Example: <https://armorpaint.org/manual.html>

Texture atlas and PTEX

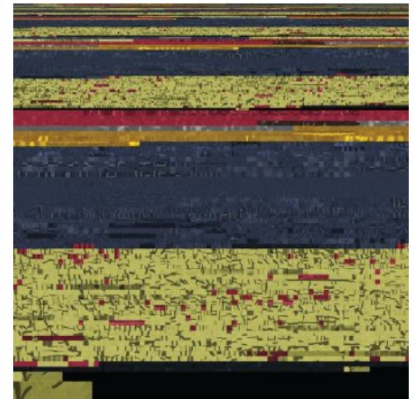
- Texture is stored per quad face of mesh → UV unwrapping is not needed.
- Direct painting on mesh is possible
- Resulting texture is stored for each quad in same image → texture atlas



(a) a single Ptex asset rendered in our real-time graphics engine.



(b) the texture data stored as a texture atlas.



(c) the same base texture data stored as a packed Ptex texture.

- <https://wwwx.cs.unc.edu/~sujeong/Ptex/>
- https://learn.foundry.com/mari/4.6/Content/user_guide/ptex/ptex.html
- <https://ptex.us/>
- <https://www.sidefx.com/docs/houdini/shade/ptex.html>

Lenses and fisheye effect

- Real camera systems can produce fisheye effect especially for wide angles, that is larger field of view
 - Either smaller field of view must be used or effect should be fixed in photo editing software
 - Example: <https://www.droneblog.com/barrel-fisheye-effect/>
- Achieving fisheye effect on purpose is done with wide-lens camera

Projects and exam

- Exam: **29.3.2023.** at 16h, Raum 136.1B
- Projects deadline: **8.4.2023**, 23:59
- Questions?