PARALLAX OCCLUSION MAPPING

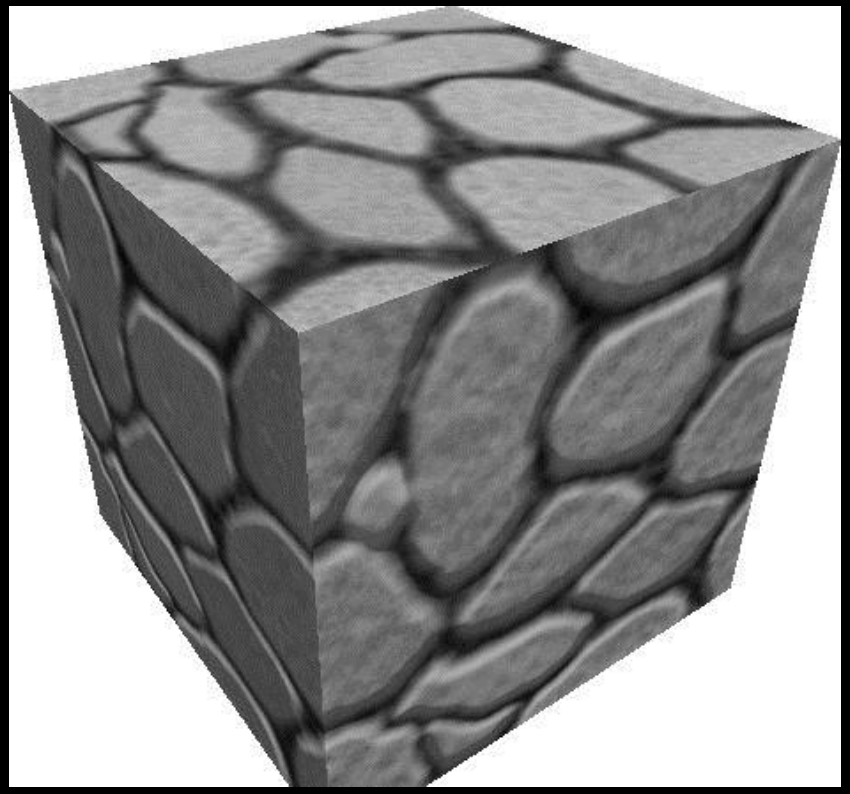
Law Smith & David Bocek

PROBLEM

- Not enough speed / memory for 3d details
  - Large stone bricks
  - Stones / sand
  - Bullet holes / destruction

PROBLEM

- Normal mapping fails at grazing angles



BACKGROUND

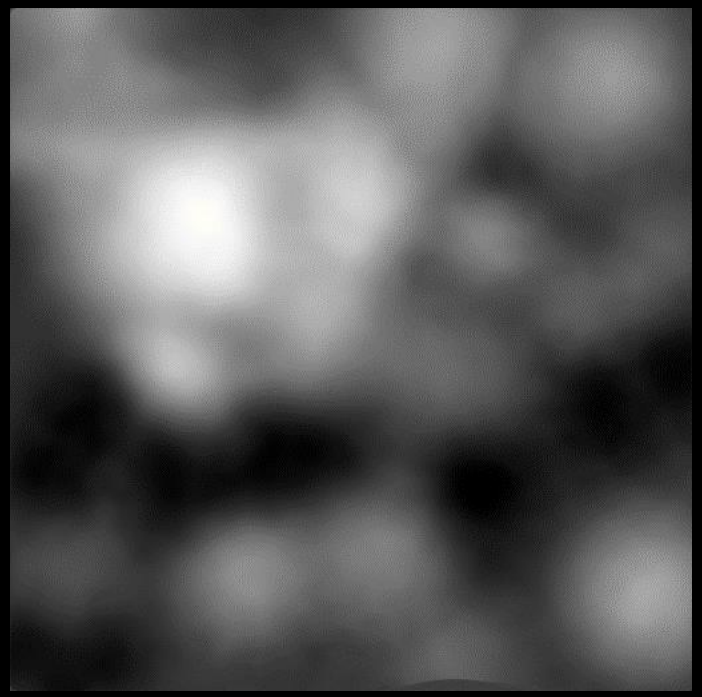
- Parallax Occlusion Mapping (POM) [1]
- Ex: CryEngine, Unigine (Oculus Rift)

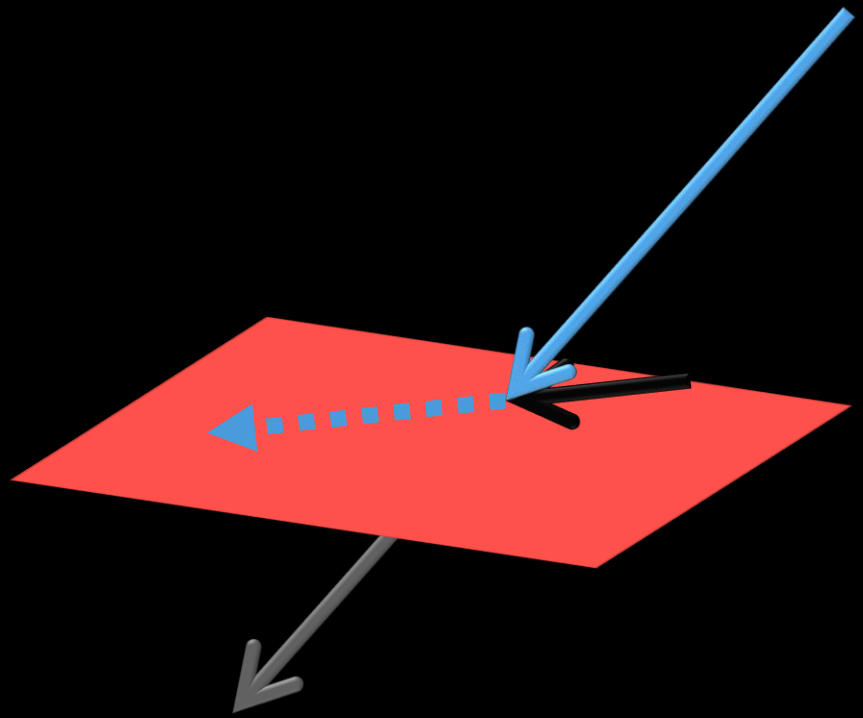
- Offset Textures on a plane

[1] Dynamic Parallax Occlusion Mapping with Approximate Soft Shadows - Tatarchuk

APPROACH

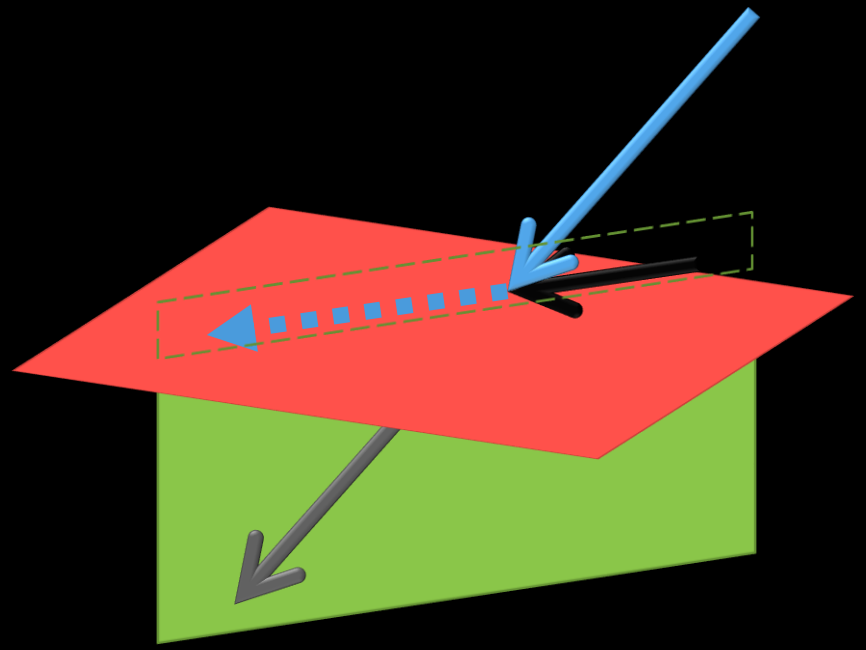
- Texturemap AND Heightmap
- Change ray to 2D tangent space

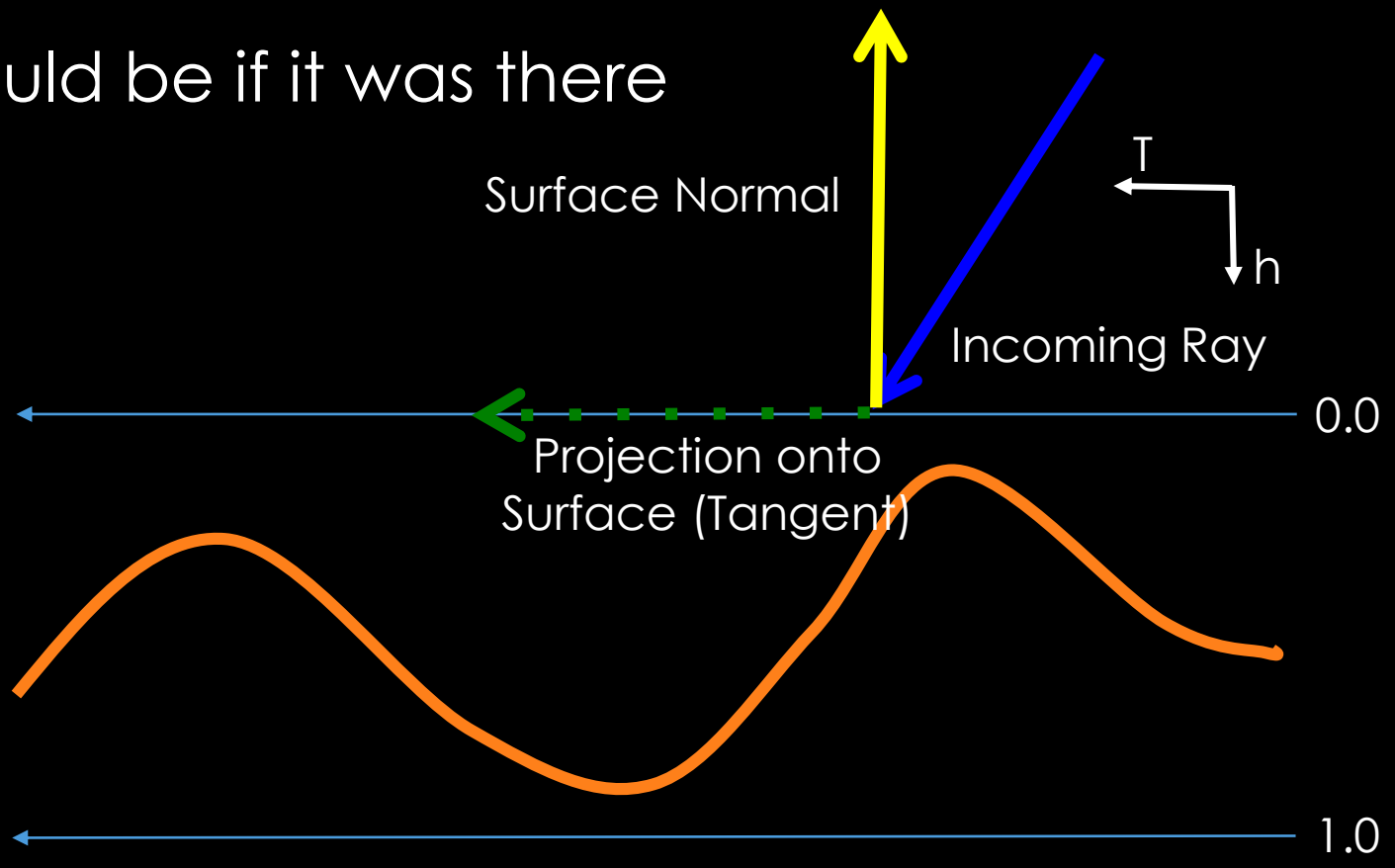




Approach

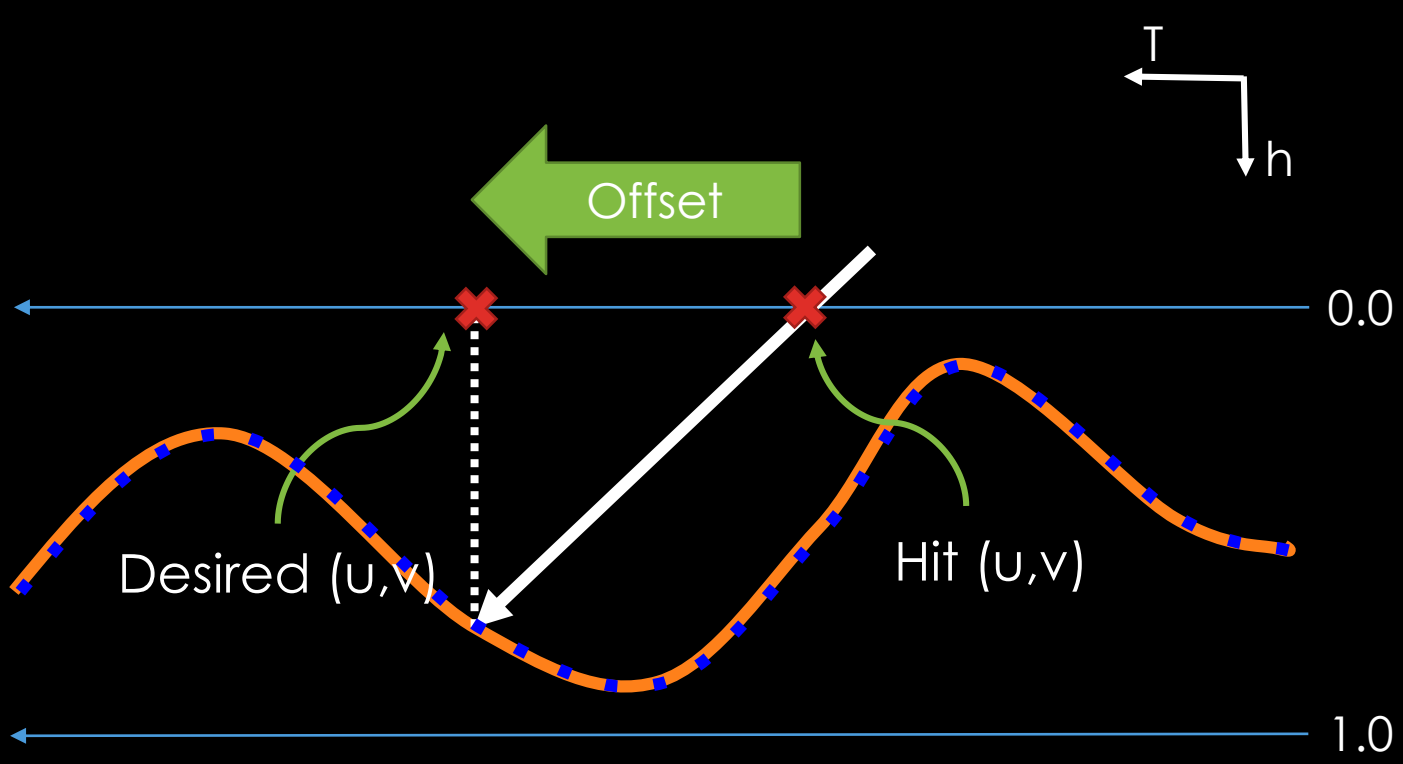
- Height curve along the tangent direction
  - From Heightmap
  - Where the mesh would be if it was there

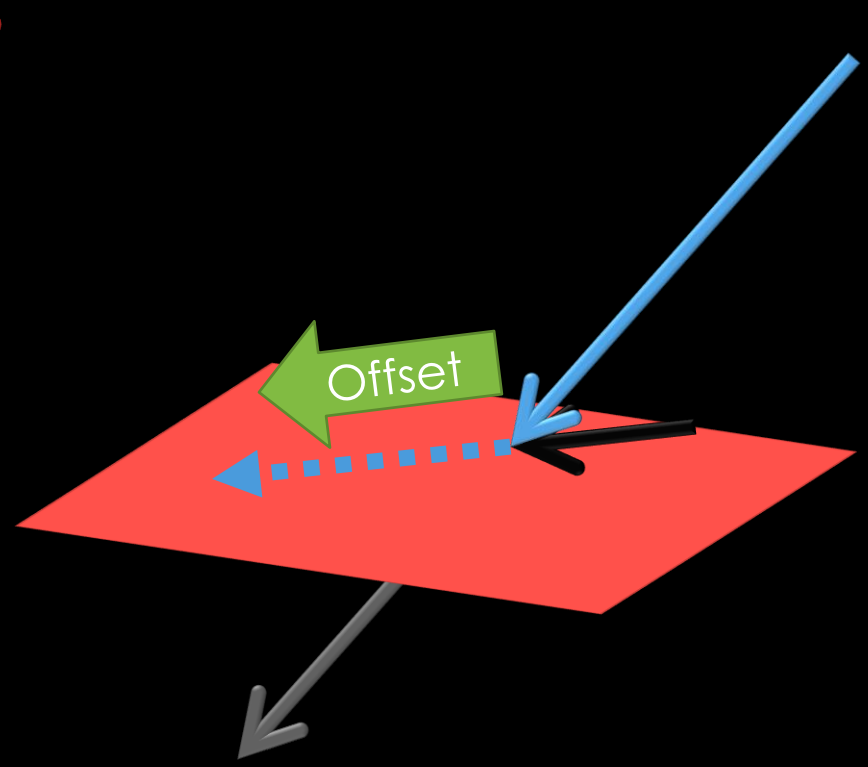




APPROACH

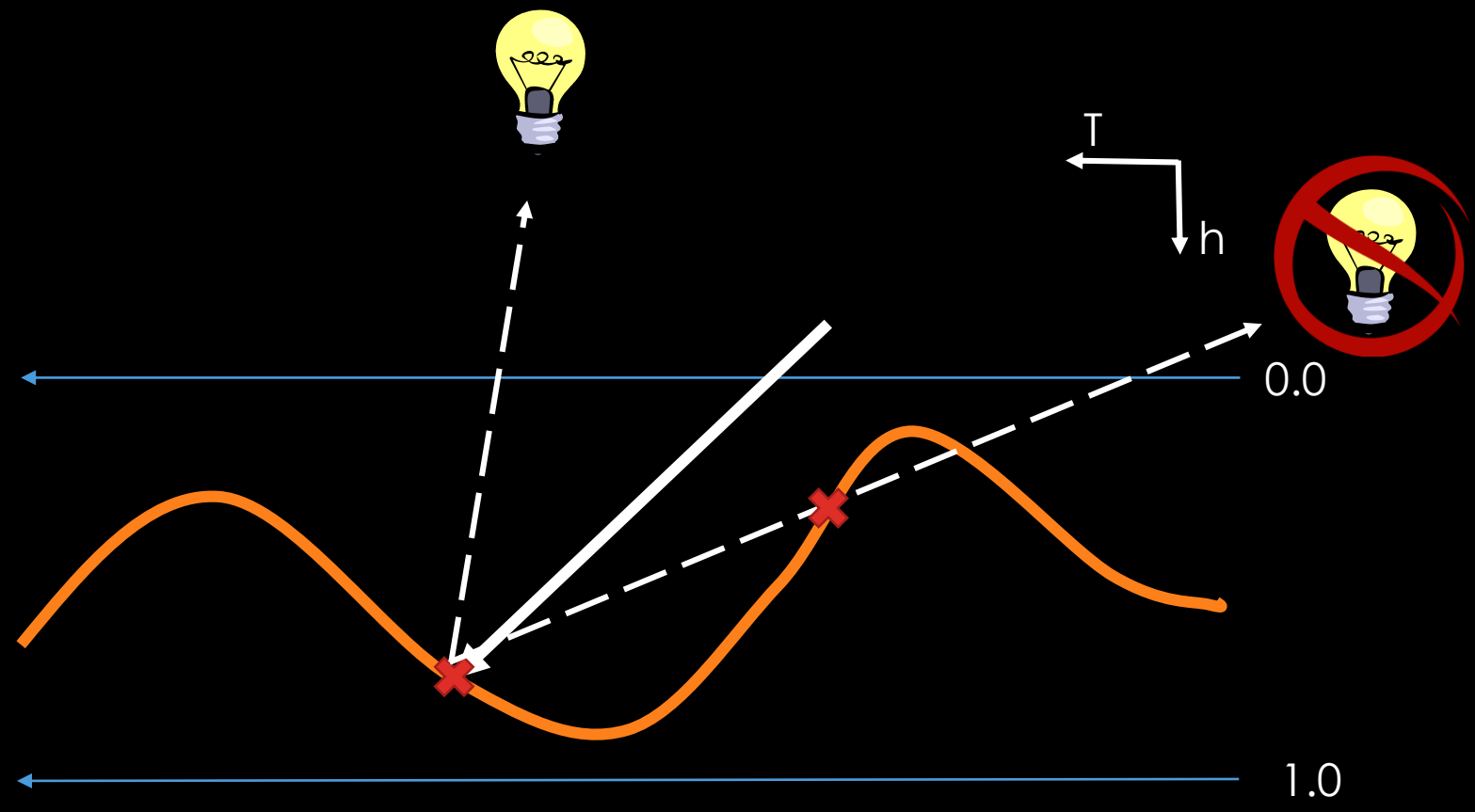
- Discretize curve
- Adjust (u,v) cords based on intersection





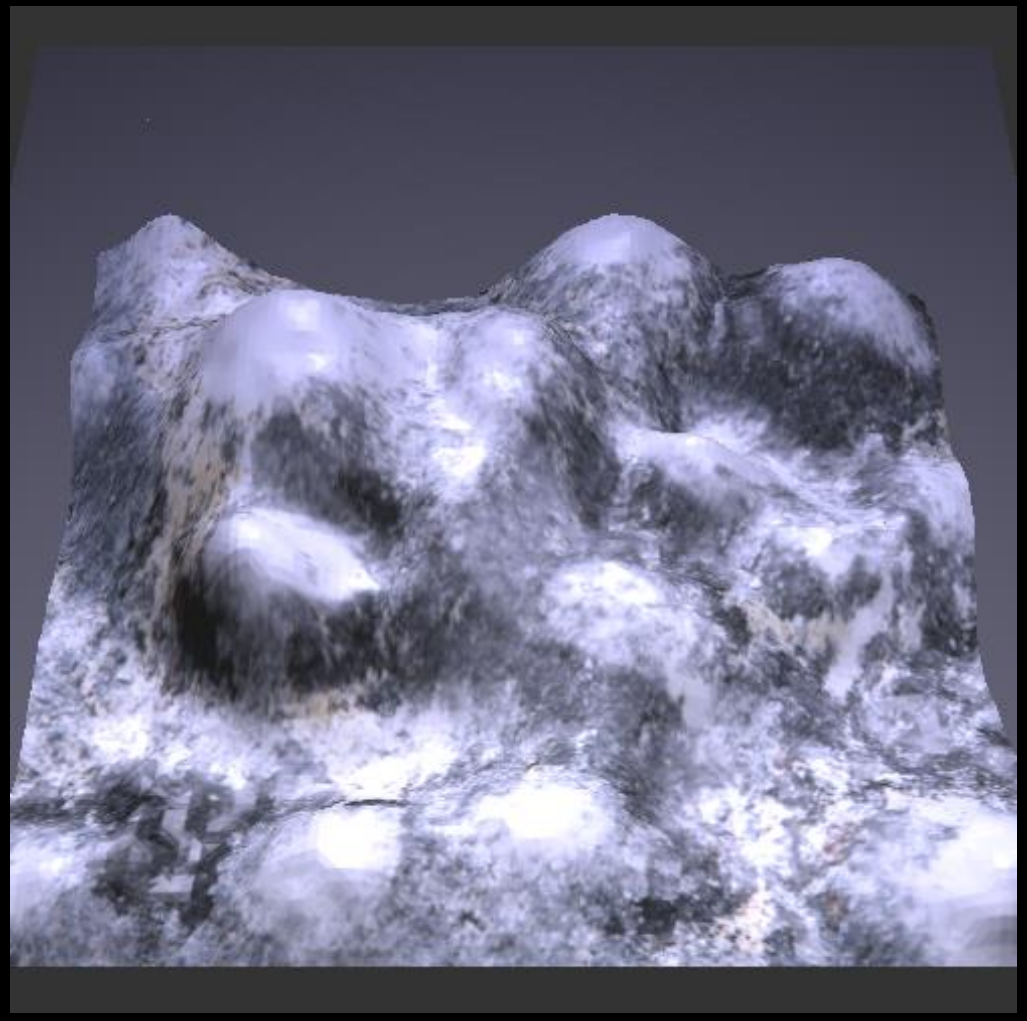
APPROACH

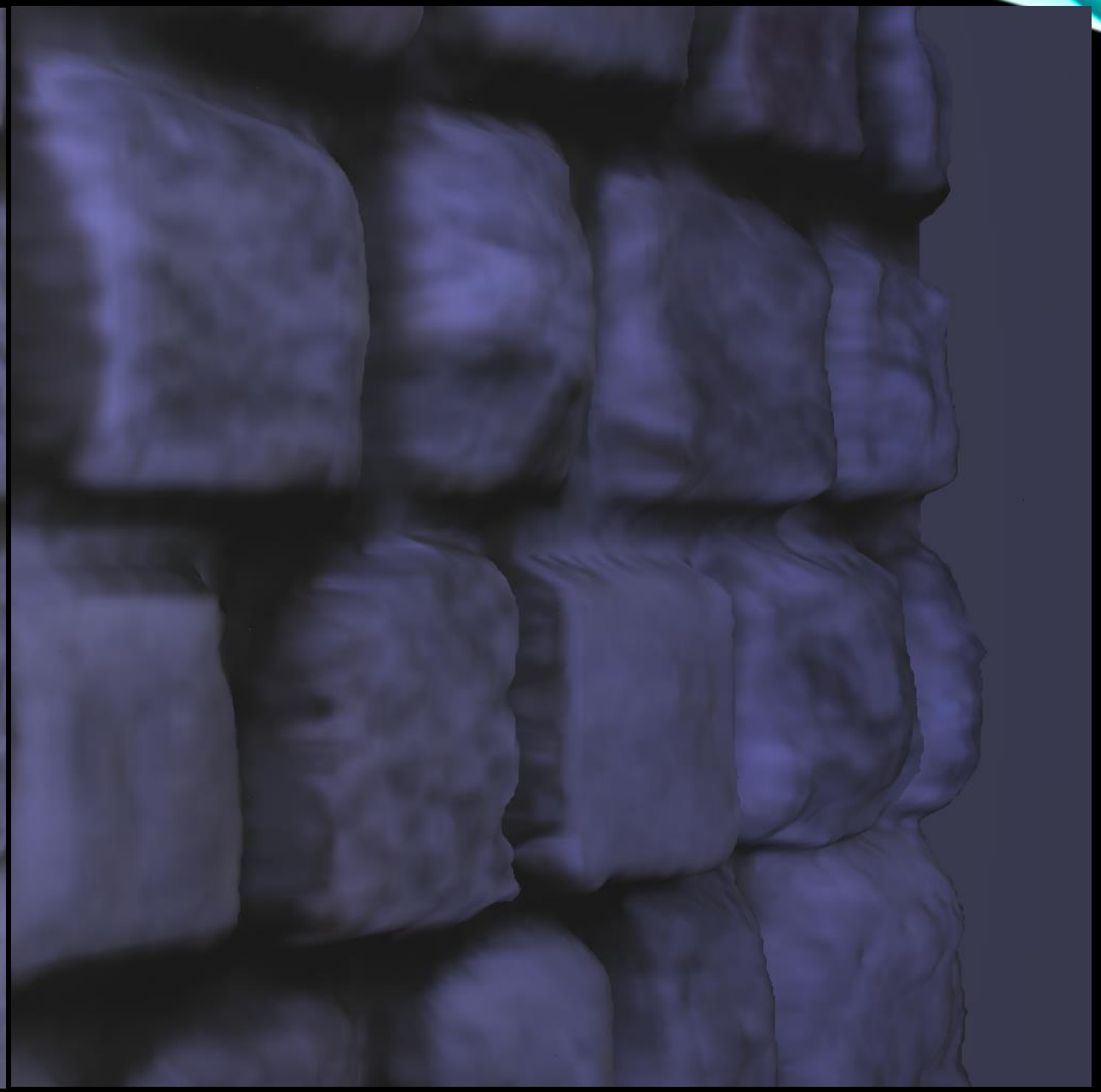
- Cast ray to lights for shadows



Standard Texture Mapping

Parallax Occlusion Mapping





QUESTIONS?

- http://developer.amd.com/wordpress/media/2012/10/Dachsbacher-Tatarchuk-Prism_Parallax_Occlusion_Mapping_with_Accurate_Silhouette_Generation(SI3D07).pdf
- http://ati.amd.com/developer/techreports/2006/I3D2006/Tatarchuk-POM-SI3D06.pdf