

LIGHTING MODELS

- Local lighting models similar to OpenGL lecture (Blinn-Phong)
- Problem: Since it is **direct** volume rendering, no explicit surface exists, therefore no normal
- -> replacement: gradient ∇f as replacement for the normal in lighting calculations
- Approximations of ∇f using finite differences
 - Forward difference, backward difference, *central difference*
 - Central difference:
 - $f'(x,y,z) = f(x+h, y, z) - f(x-h, y, z),$
 $f(x, y+h, z) - f(x, y-h, z),$
 $f(x, y, z+h) - f(x, y, z-h)$

GLOBAL ILLUMINATION

- Local lighting models cannot represent shadows, caustics, refractions, and other global effects
- *Global Illumination* techniques such as *Photon Mapping*, *Metropolis light transport*, *Radiosity*, and *raytracing* provide higher quality shadows, but are slower to compute

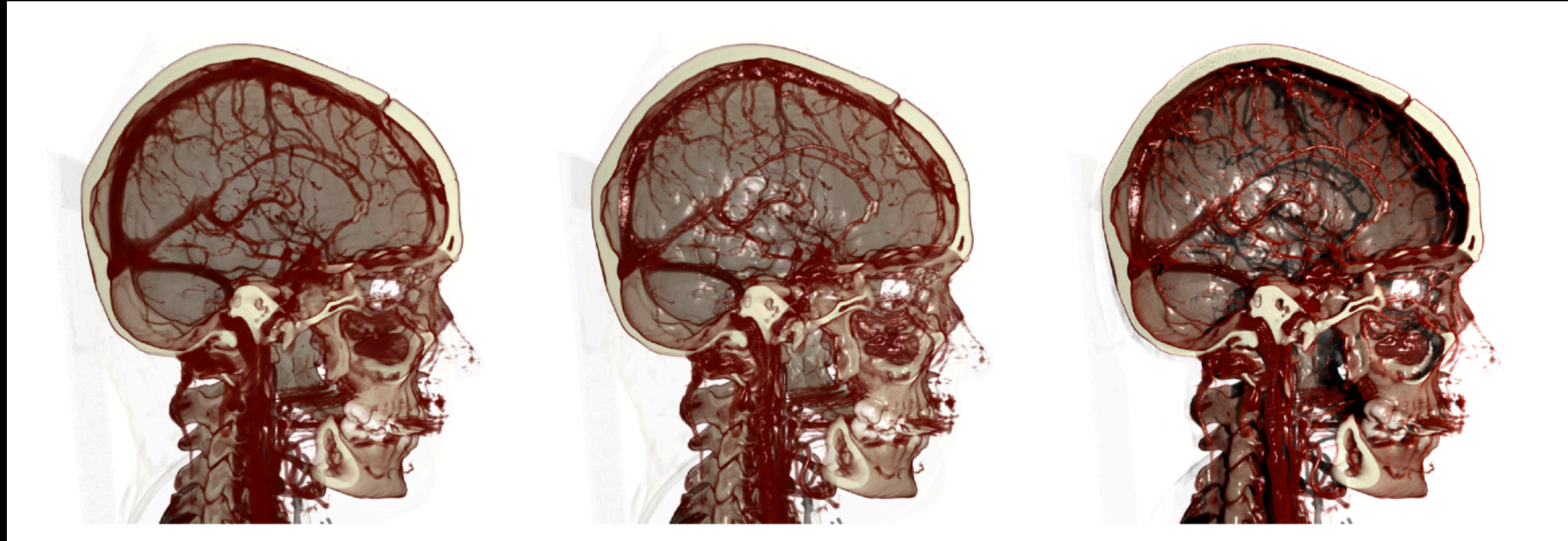


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