

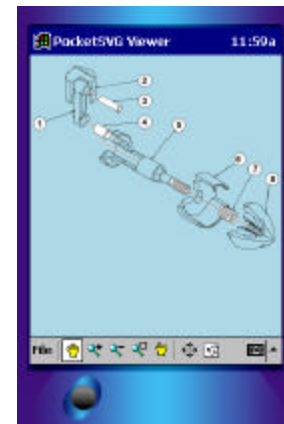


# **MQP Interests 2006-2007**

by Emmanuel Agu

# Outline of Talk

- My Target: 2 MQPs for the year
- Area:
  - Graphics on mobile devices





## Power consumption

- Most RT graphics algorithms optimized for speed
- Battery energy is main problem on mobile devices
- Ray tracing used for photorealistic rendering
- Raytracing now implemented on programmable GPUs
- **Our focus:** reduce energy usage of GPU RT

- **Project Idea: Ray tracer on mobile Device**
- **Thrust: Speed/Power trade-offs in Ray Tracer**
  - Our group has written GPU Ray tracer
  - MQP: Reduce energy consumption of ray tracing algorithms
  - Key finding: 1 memory access can consume up to 200x energy of 1 CPU instruction
  - Implications: reduce memory access = reduce energy use
  - Example: Consider speed-power trade-offs for
    - Acceleration structures (uniform grid, bounding volumes, BSP trees, Kd-trees) → Our current focus

# Possible experiments

- Reflection/refraction algorithms

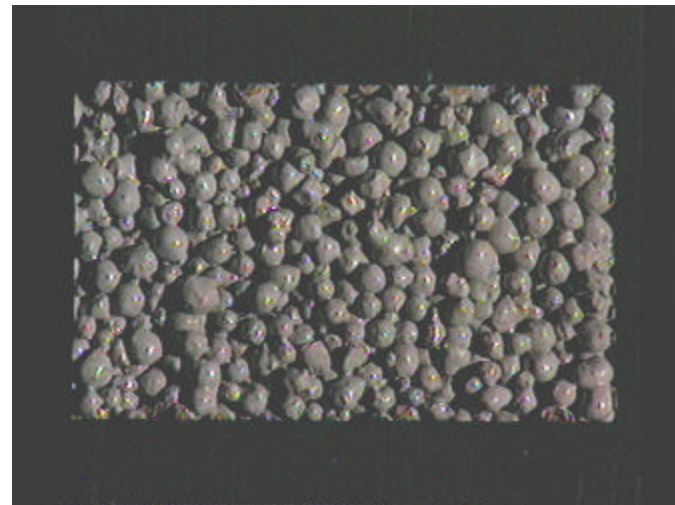
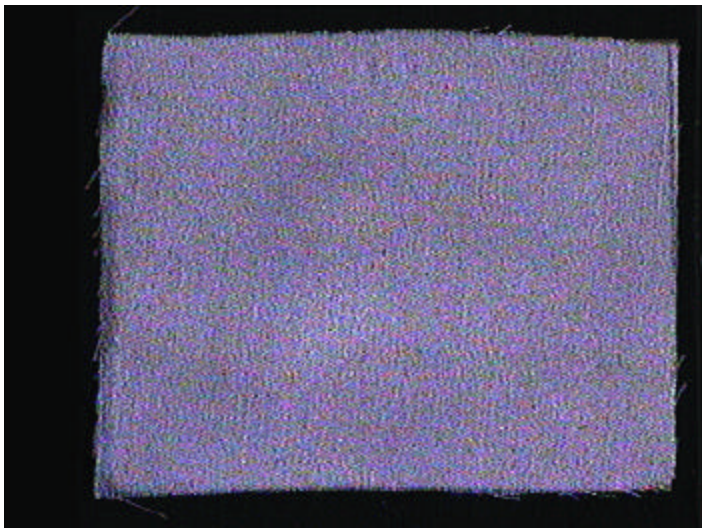
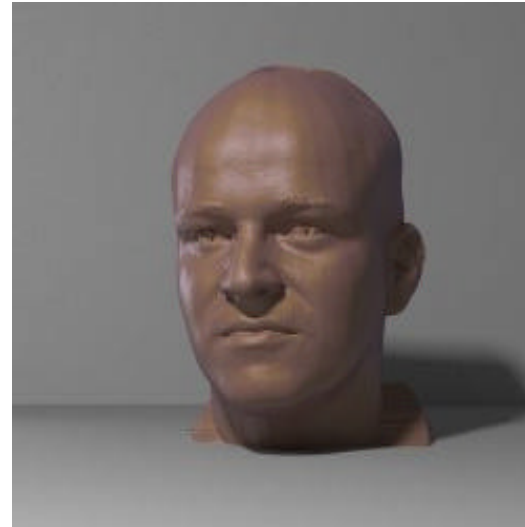
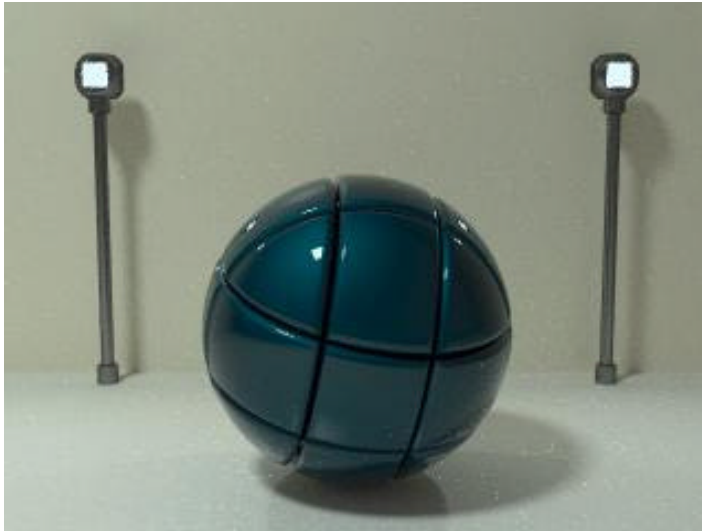


- Shadows



## Possible projects

- Shading techniques and surface materials (BRDFs)





## Possible projects

- Texturing (2D, 3D, Noise, scattering functions, etc)



## Contact/More info

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