Beta Demonstration
Sparse Virtual Texturing

Team 2. Boeing
CSE 498, Collaborative Design

Department of Computer Science and Engineering
Michigan State University

Fall 2009
Project Overview

• Create an OpenSceneGraph plug-in
  – Utilizes sparse virtual texturing techniques
  – Efficiently use high resolution textures

• Create an Application
  – OSG example
  – Demonstrate functionality
Problem

• Using High Resolution Textures
• Graphics Card Requirements
  – Wants entire texture to draw the scene
  – Wants textures that fit in memory

• Current Methods
  – Tedious
  – Inefficient
Solution

• Pre-process Image
  – BSVT format
  – Stream from disc efficiently

• Pre-render Scene
  – Check used parts of texture
  – Stream needed, non-present parts
Solution

- Update Scene Texture
  - Replace present, unused parts
  - Pass updated texture to indirection shader

- Indirection Shader
  - Contains page table
  - References scene texture
  - Corresponds texture coordinate with scene texture
Architecture

CPU

OpenSceneGraph Visual Application

Sparse Virtual Texturing Plug-in

Texture

Database (Managed by OSG)

Readback Shader

GPU

GPU Memory

Indirection Shader
Screen Shot
Screen Shot
Screen Shot
Screen Shot
Building The Page Table

- For each mip level:
  
  If the page is present in the scene texture:
  - Record its location in the scene texture
  - Set the “bias” to 0

  Otherwise:
  - Iterate through subsequent mip levels until the requested page is present
  - Record lower resolution page's location in the scene texture
  - Record the “bias”