Final Project Discussions

CS148 Fall 2018
Overview

- Quick overview of how each CA evaluates images
- Positive and negative examples from prior years
- Today: Ed, Winnie, Kevin
- Thursday: Mike, Lucy, Tien-Ning
Reminder: Final Project Deliverables

- Due 12/12
  1. Writeup
  2. Image
  3. Variant A
  4. Variant B

- Due 12/13: High quality render of #2

- Grading: images sorted into ten “buckets”
Stats from Last Year

- Bucket 10  -- 9 images  -- A+
- Bucket 9   -- 16 images -- A+
- Bucket 8   -- 25 images -- A
- Bucket 7   -- 22 images -- A-
- Bucket 6   -- 16 images -- A-
- Bucket 5   -- 15 images -- B+
- Bucket 4   -- 9 images  -- B
- Bucket 3   -- 2 images  -- B-
- Bucket 2   -- 4 images  -- B-
- Bucket 1   -- 0 images  -- N/A
Kevin’s Slides
An Example Final Project Walkthrough
Scanline Rendering vs. Raytraced

Scanline Rendering

Raytraced
Scanline Rendering vs. Raytraced

Scanline Rendering  Raytraced

First, let’s examine the scanline rendering more up-close
Plane textured with a photo of water and normal map.
Generated with a loop using mostly the same objects.
Loaded-in mesh.
Background is an image textured onto a plane.
Point lights at each lantern, but no reflections or shadows.
Also would expect some reflection of the sky with all those stars.
Scanline Rendering vs. Raytraced

How to address the issues with the ray tracer functionality?
Reflections / Shadows
Note: Enabling reflections and shadows may cast shadows onto your background planes. This person appropriately edited the code to handle this.
Artistically, the diagonal placing is an improvement.
Scanline Rendering vs. Raytraced

Overall, nice result without needing to be too technical.
Mountain are hard to see and should have some light (tricky to implement)
Low Poly; Flat Shading
Brighter the further away?
Some More Technical Projects
Background image blurred + scaled in photoshop.
Objects mostly downloaded, except the mugs.
Implemented marble subsurface scattering using GPUGems.
Simulated ceramic with transmissive objects.
Flat shading due to low poly.
Objects look too “perfect”
Transmissive
Large area lights for outdoors effect.
Refraction + Caustics with Photon Mapping
Depth of Field
- Bifrost simulation in Maya to generate water mesh
- Made his own background texture using a combo of Maya and Photoshop
- Still implemented a few technical effects in the raytracer as well
- Transmissive shadow rays, area light attenuation, depth of field...
A Last Note on (Artistic) Focus
Oh, one really final note...
Ron really likes cars!
Ed’s Slides
Aliasing

- Can really hurt an otherwise good image
- Between 12/12 and 12/13, turn up your number of samples!
Aliasing

- Can really hurt an otherwise good image
- Between 12/12 and 12/13, turn up your number of samples!
Flat Shading

- Individual faces are obvious
Even in a very polished image...
Even in a very polished image...
Model Mismatches

- Low-poly is an aesthetic that some pursue purposefully
- But low-poly and high-poly models often look bad together
Model Mismatches

- Low-poly is an aesthetic that some pursue purposefully
- But low-poly and high-poly models often look bad together
Bad Lighting - No Shadows
Bad Lighting - Unrealistic Shadows
Bad Lighting - Too Dark
Good Lighting - Christmas Lights

- We often encourage you to start with simple white lights; this is a very effective counterexample.
- Note the colors on the table, the picture frames, the red and green on the figure’s arms, etc.
- Refraction in the glasses, reflection on the tabletop.
Good Lighting - “Sunlight”
Bucket 7 Image #1

Bucket 10 Image #1
Bucket 7...

- Background is obviously 2D
- Ground texture is low resolution
- Grass is heavily aliased
Bucket 10...

- Simple… but looks good
- Textbook refraction of straw
- Refraction in glass, reflection on table
“Model Clutter”

- Individual models look good!
- But they aren’t tied together into a coherent image
Contrast with...

- More models than in previous scene!
- But their arrangement make sense; the image tells a story
Model Clutter: One More Example
Similar idea, less clutter
Summary

● Small details
  ○ Aliasing
  ○ Flat shading

● Composition
  ○ Lighting
  ○ Model clutter

● Arrange in Maya/Blender, but tune lighting in class ray tracer
● Look better than OpenGL (lighting, shadow, …)
● Make the ray tracer work for you (reflection, transmission, …)
● Coherent models, scene setup, “aesthetic”
Winnie’s Slides
What I look for in an image

- **Clear point of focus** or theme

- **Cohesive and balanced** object placement and materials

- **Well-structured** lighting and camera position (bonus if it’s interesting)

- **Technical achievements**
  - should help make an existing “good image” better
  - (No deductions if they don’t, but very little boost to the rankings I give)
+ Simple but effective and **focused**
+ Good use of **depth of field**
+ Good use of **reflection**

Reflected wood planks **a little too dark**
Now, in contrast ...
Composition has potential

Objects **don’t blend well with background**

Materials **simplistic**

Lighting **inconsistent** (background image)

More **crop** on right hand side
+ Cohesive
+ Good lighting
+ Technical contributions effectively showcased (ex. custom materials on Holy Grail, shadow ray attenuation, modified area lights)
(Minor) Composition wise, could leave a bit more white space above globe/in front of pen
Now, in contrast ...
+ Good **variety** of objects
+ Water bottle has nice **specular highlights**

Objects mostly look **flat**

Scene is **unfocused** (where to look at?)

**Aliased**
That being said ...
General Tips for an interesting image

- **Play around with materials and lighting**
- **Avoid “clutter” by spending time on composition**
  - Reference concepts from photography such as rule of thirds, leading lines, foreground-background separation
    - *(Example internet post*, there are many other resources available)*
  - **Effective sketches i.e. “storyboarding”** can save you (some amount of) time, sweat, and tears
General Tips on a good image

- **Should be complete!**
  - A simple, well executed image > a complex, unfocused image
  - Work in increments:
    - get an okay first version first before working on details

- **Technical ↔ Artistic**
  - Budget your time effectively:
    - If you spend time implementing something advanced, ideally it should visibly contribute to your image
Lots of detail, careful use of reflections
Did not add any extra functionality to raytracer

Artistic v.s. Technical
Extremely impressive technical work (path tracing)
Scene is basically a cluttered Cornell box

Artistic v.s. Technical
Good image that would’ve been a lot worse without depth of field

Artistic v.s. Technical
# Specific tips

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