Final Project Discussions

CS148 Fall 2019
Overview

- Quick overview of how each CA evaluates images
- Positive and negative examples from prior years
- Today: Kevin, Amy, Yinchen
- Thursday: Crystal, Fang-Yu, Jane, Lucas, Yilin
Reminder: Final Project Deliverables

- Due 12/11 (12 PM PST)
  1. Writeup
  2. Image
  3. Variant A
  4. Variant B

- Due 12/12 (12 PM PST): High quality render of #2

- Grading: images sorted into ten “buckets”
Stats from 2017

- 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
Stats from 2018

- Bucket 10 -- 11 images --
- Bucket 9 -- 23 images -- (A+)
- Bucket 8 -- 29 images --
- Bucket 7 -- 30 images --
- Bucket 6 -- 35 images -- (A)
- Bucket 5 -- 24 images -- (A-)
- Bucket 4 -- 15 images -- (B+)
- Bucket 3 -- 14 images -- (B)
- Bucket 2 -- 10 images --
- Bucket 1 -- 2 images -- (B-)
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.
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?
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)
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!
Amy’s Slides
Wanted to create a surreal and futuristic scene

Chose colors, lighting, and composition to focus on ship in the foreground

Implemented depth of field
What I will be looking for in an image:

- Appears natural (no weird shadows, aliasing)
- Errors are not immediately apparent
- Coherent story to the image (objects “belong” together)
- Good lighting, composition, and choices of colors in the scene.

Bonus points for:

- Interesting premise
- Effective use of technical extensions (depth of field, motion blur, etc)
What I will be looking for in an image:

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- **Good lighting, composition, and choices of colors in the scene.**

Bonus points for:

- Interesting premise
- Effective use of technical extensions (depth of field, motion blur, etc)
Lighting
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”
Some tips about Lighting

Having multiple point lights give a soft, dim scene. Feel free to add lights in any place in your scene.
A strong area light usually is good for well lit scenes. And you can use another point light to fill up.

Reference: CS348 Assignment 1
Lighting can completely change the mood of your scene!

https://vimeo.com/63602119
Composition
“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
Rule of Thirds
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Frames
Triangles
Make sure the focus of the image is where you want it!
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Color
Tools for Choosing Colors

https://color.adobe.com/create/color-wheel/

https://www.tigercolor.com/color-lab/color-theory/color-harmonies.htm
Yinchen’s Slides
Walk through my project last year
Part 1. Mountain

1.1 From Heightmap to Geometry

- Import into geometry (Maya, Blender, and Unity3d all have supporting tools)

- Smooth the surface (Some import tools would claim the height for places not covered by the heightmap are zero)

- Export the obj file for future usage.
Part 1. Mountain

1.2 Bind some materials

Fetch some textures of snowy ground / mountain. We are not super strict about where should be snow and where should be dirt, so no uv-mapping is needed! (but randomized texture preferred)
Part 2. Skydome

Similar to Skybox but easier to handle and better performance.

Hemisphere geometry + Holographic image texture
It was in bucket 6, so what can we improve?
- Improper resolution for the road. Bricks are blurry.

- Illuminating background with no proper light sources is not so realistic

- Composition is not emphasizing any part (I missed the project instruction lecture last year)
Images I really love but rank average

Bucket 6

Maybe because:

- lighting is too dark

- A chunk of bright color around the roof
Bucket 6

Maybe because:

- model and sphere in the scene has noise
- Lighting is too dark
Bucket 7

- Hard Shadow in open scenario
- Transparency can be higher
- Arrange the context of the scenes to show the best visual effects. (Similar structure and contents but scores are 9 vs 7)
- In the second image, glowing background conflicts with the light source on the table.
- Arrange the color wisely. It can influence a lot of region in the image. (9 vs 6)
- Don’t struggle too much on technical parts that are not your emphasized part. (10)
Final tip: It’s hard to please all. When you hesitate, just follow your own preference rather than guessing what others would prefer.
That’s it for today!