

# CS148 Final Project

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## Introduction

*The pink panther is stolen!  
Rumors of a pink shadow striding in the Bladerunner-inspired backstreets.  
Dispatching police drones!  
Finally, the culprit was caught on camera! But it's... Kirby?  
Is he the real culprit or...?*

## How Project Requirements Were Met

1. Main Geometry from scratch: at least half of the main objects in your scene needs to be modeled/simulated/sculpted from scratch. Main objects are objects that are supposed to be the focus of the scene.

We consider “main objects” in our scene to be the following:

- Kirby character - custom
- Jewel/gem bag - online, deformed by hand
- Gems - mix of online and custom gems
- Police drones - online
- Foreground buildings - online
- Foreground shops/facades (TV shop and noodle bar) - custom
- Foreground neon signs - custom
- Ground/water - custom (simulated water)

Most of the focal elements in the scene are custom and even the ones that were downloaded from online were semi-customized (edited textures and materials, etc.).

2. UV mapping and Texturing from scratch: for at least one of the objects made from scratch in your scene, you must 1. UV unwrap the object yourself and 2. create a texture from scratch either via hand-painting or procedural generation with Blender's material nodes. These two requirements can be done on two different objects.
  - a. Kirby's facial feature texture are unwrapped by hand while following tutorial
  - b. Kirby's facial feature texture is painted by hand through gimp

3. Create a custom/procedural material: make at least one material that uses OSL script nodes, or non-shader nodes (i.e. texture, color, vector, converter nodes).

We fulfilled this requirement with a few different custom/procedural materials:

- Skydome is all procedurally generated and emits stars plus realistic looking clouds (note: can't really see this due to how shot is set up plus volume scattering applied).
  - Custom transparent glass texture uses a mix of shader and mixing nodes to produce better-looking glass than the default glass BSDF material.
4. Blender/Cycles feature: Use at least one advanced feature in Cycles or Blender (e.g. depth of field, motion blur, denoising, volumetric, post-processing).

We used the following advanced features in Blender/Cycles:

- Applied motion blur to chasing police drones.
- Used OpenImageDenoise denoiser on final render.
- Applied volumetric scattering to add a foggy/misty effect to the scene.
- Simulated water ripple by animating foot striking water in a running fashion

## Stefan's Contributions

### List of Assets Made by Me

- Foreground neon signs, including:
  - Atari glass neon sign.
  - Noodle bar sign with dangling wires.
  - White Dragon sign was made by tracing a bitmap image (from Bladerunner!) and converting to an SVG and then producing as a mesh in Blender.
- TV shop arrangement
  - Edited original building facade to create windows with custom glass material.
  - Arranged mix of custom and downloaded assets. Created rack wall. Additionally, there was a lot of semi-custom texture work to add emissive materials to our own images to the downloaded TV assets.
- Noodle bar arrangement
  - Edited original building facade and extruded geometry to create open-window noodle bar set. Arranged mix of custom and downloaded assets.
- Background bar facade with custom frosted glass material and spotlights.
- Procedurally generated skydome texture with stars and realistic clouds (not very visible, however).

- Rubber wires made from catenary curves found in foreground neon signs plus electrical wires that go across the street in the background.
- Custom transparent and frosted glass materials used throughout the scene.
- Lots of other minor semi-custom work done on downloaded assets, including but not limited to the following:
  - Modified several building textures to remove baked-in window textures and replaced with transparent ones so I could place custom glass material planes behind them for a more realistic scene.
  - Modified existing billboard object with Japanese Coca-Cola ad plus lighting.
  - Modified drone textures to include police signage.

## List of Online Assets Used

- Police drones:
  - <https://www.cgtrader.com/free-3d-models/character/sci-fi/drone-4d3bfe04-69d8-420a-916f-dbf3cfa79ad2>
- Main buildings/facade
  - <https://www.cgtrader.com/free-3d-models/exterior/cityscape/nyc-block-set-8-f61d6947467ccd3aa5af24db320235dd>
- Old TV model
  - [https://polyhaven.com/a/Television\\_01](https://polyhaven.com/a/Television_01)
- Retro-futuristic TV model
  - [https://3dsky.org/3dmodels/show/tiellievizor\\_brionvega\\_algol](https://3dsky.org/3dmodels/show/tiellievizor_brionvega_algol)
- Tonone tubes lighting for TV shop:
  - [https://3dsky.org/3dmodels/show/tonone\\_tubes\\_1](https://3dsky.org/3dmodels/show/tonone_tubes_1)
- Stools outside noodle bar:
  - [https://3dsky.org/3dmodels/show/stool\\_tolix\\_1](https://3dsky.org/3dmodels/show/stool_tolix_1)
- Kitchen equipment for noodle bar
  - [https://3dsky.org/3dmodels/show/kukhonnyi\\_nabor\\_49](https://3dsky.org/3dmodels/show/kukhonnyi_nabor_49)
- Open Sign for noodle bar
  - <https://www.cgtrader.com/free-3d-models/exterior/street/game-ready-japanese-signs-set-sign-neon-24h>
- Background Chinese neon signs
  - <https://www.cgtrader.com/free-3d-models/architectural/lighting/3d-animated-neon-sign-model-pack-volume1>
- Drinks neon sign for background bar
  - <https://www.cgtrader.com/free-3d-models/architectural/decoration/neon-3d-model-5-the-martini>

## Online Resources Referenced

- Existing building UV mapping and texture stretching issues were fixed with this tutorial:
  - <https://youtu.be/rWC7Ki7MNEw>
- Tutorial for producing a simple black rubber material (used extensively for wires in our scene):
  - <https://youtu.be/ofEM44aeUKo>
- Tutorial for creating wires from catenary curves:
  - <https://youtu.be/gCxDxi0ibOM>
- Tutorial for creating more realistic 3D textures from existing base color texture. This was referenced in HW8 and used extensively on the existing buildings' outdated textures to add some roughness and normals so that light would interact with them more realistically.
  - <https://youtu.be/qfrRtmJFaMM>
- Tutorial for handling transparent textures with alpha parameter in shader editor. Used when editing existing building textures to remove baked-in fake-looking windows and make them transparent so that I could put a realistic glass plane mesh behind them.
  - <https://youtu.be/f273uPV0RvA>
- Applying textures to individual faces:
  - <https://youtu.be/CXpbK2T1HJA>
- Tutorial for using the node wrangler add-on and the Ctrl+Shift+T shortcut to select and add all texture maps to a given BSDF node. Super useful!
  - [https://youtu.be/iP3\\_WOi4aco](https://youtu.be/iP3_WOi4aco)
- I referenced several tutorials to make the numerous custom neon signs littered throughout the scene, including:
  - Creating from SVG (custom White Dragon sign was done this way):
    - <https://youtu.be/JGJlxwO8xbc>
  - More general text-based signs created using this tutorial:
    - <https://youtu.be/8eNN2Ep3Rqs>
- Creating the procedurally generated SkyDome with stars and night sky (which ultimately you can barely see due to framing of shot plus volumetric scattering):
  - <https://youtu.be/UKXs-6PUG5M>

## Yingda's Contribution

- Kirby
  - Body parts are sculpted by hand
  - UV mapping of texture is based on online tutorial
    - <https://www.youtube.com/watch?v=ephIRveqGc8&t=741s>

- Facial features textures are drawn from scratch
- Mask texture is sourced online
  - <https://ambientcg.com/view?id=Fabric042>
- Steps for applying different textures to same object is inspired from
  - <https://blender.stackexchange.com/questions/516/add-different-materials-to-different-parts-of-a-mesh>
- Shaders for body, hand and foot are tuned by hand.
- Bag
  - Object and texture are sourced from
    - <https://www.cgtrader.com/free-3d-models/various/various-models/tied-clot-h-bag>
  - Deform/sculpted/ripped by hand to suit need
  - Texture tuned for a darker color
- Gems
  - Diamond shaped and round shapes (3 out of 5) gems are crafted by hand
  - Crafting and shading are inspired by following tutorial
    - <https://www.youtube.com/watch?v=4sk6RFcORd0&t=224s>
  - Rectangular diamonds(2 out of 5) are sourced online
    - <https://www.cgtrader.com/free-3d-models/various/various-models/gem-stones-pack-0c0ca99b-b144-4866-8e34-306999076d06>
- Water Simulation
  - Shader is tuned by hand and inspired by tutorial
    - <https://pierodetomi.medium.com/how-to-easily-setup-a-good-water-shader-in-blender-tutorial-3e0d20e6132e>
  - Dynamic Paint simulation is inspired by
    - <https://www.youtube.com/watch?v=aea6Kb7vcmE>
  - Surface generated by animating kirby's to impact the water in a running motion
- Pink Panther
  - Texture maps generated from
    - [https://en.wikipedia.org/wiki/The\\_Pink\\_Panther](https://en.wikipedia.org/wiki/The_Pink_Panther)