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CS148 Final Project Report

Project Requirements

As enthusiasts of advanced technology, electronics, and urban scenery, we have created a **PCB-City** for our CS148 Final Project. Essentially, this PCB-City combines the microscopic views of electronic components with the cyberworld of *Tron: Legacy* featuring futuristic infrastructure.The finished product emphasizes the use of procedural geometry, 3D modeling, shading, advanced illumination, advanced rendering, texturing, color bleeding, and advanced Blender features.

To fulfill the project requirements, we have rendered the scene using Cycles and applied **ray tracing** to the white neon lights along the microchip in the scene to create a glowing effect. To make the illusion of a city, we have illuminated various edges of the microchip, where ray tracing has also been implemented so that the pins of the microchip **reflect** its surroundings, as well as **direct and indirect light sources**. By doing this, shadows, reflections, and transmissions have been smoothed, bringing a realistic aspect to the image. Using different accent colors on various components, we have also experimented with **color bleeding** against the dark shadows of adjacent components or “buildings.”

Without including humans in the scene, we have modeled different types of electrical components and have made them appear as buildings, roads, or bridges. **All geometrical components** in the scene have been **made from scratch** while referencing some tutorials on modeling motherboards in Blender. We have also utilized **procedural geometry** to build a great expanse of components across the PCB.

Subsequently, we created **UV maps** for the pins of the microchip, which allowed us to use our **neon texture made from scratch** and apply it to this UV map by **hand-painting** the texture along the faces of the pins. The neon lights are used to illuminate the parts of the microchip to create interesting shadows along the larger, more daunting parts of the microchip, integrating **contrast** to the overall image.

Lastly, we used **volumetrics to build fog** rising up behind the microchip, allowing the image to look futuristic by imitating the immense glow of the microchip. Additionally, we applied **depth of field** to the image by focusing on the pins of the microchip, painting another illusion of great distance between the viewer and the main object. These advanced features working together make the microchip seem much taller relative to the surrounding sprawl of components.

Partner Contributions

1. PCB Object: Evelyn & Sam
2. PCB Materials: Evelyn & Sam
3. Microchip Object: Evelyn
4. Microchip UV Mapping: Evelyn
5. Microchip Texturing: Evelyn
6. Lighting & Camera: Sam
7. Blender/Cycles advanced feature: Evelyn & Sam

Imported Assets

None of the aspects featured in our project were imported – everything was made from scratch or made from scratch while following an online tutorial.

Referenced Tutorials

1. Motherboard Geometries
2. Neon Textures & Glow

Project Inspirations

CS148 Project Proposal, Evelyn Nutt & Sam Jett