CS 499 Milestone 2 Narrative Thompson  
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Category One:

1. Briefly describe the artifact. What is it? When was it created?

The artifact I am presenting is a 3D scene project that replicates my personal desk setup, which I originally created in CS 330: Computational Graphics and Visualization. This scene includes a lavender corner desk, three monitors, and a keyboard, modeled using basic geometric shapes such as boxes and cylinders. I used OpenGL to code the project and applied textures to simulate surface details, allowing users to navigate through the scene using a virtual camera controlled by keyboard and mouse inputs. The project was initially developed during the course to demonstrate my understanding of 3D modeling, scene navigation, and texture application in a computational graphics environment.

2. Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?

I selected this artifact for inclusion in my ePortfolio because it showcases my ability to create interactive 3D scenes, a vital skill in both software engineering and computational graphics. The original project highlights my proficiency in OpenGL, where I utilized fundamental 3D modeling techniques and basic transformations to replicate real-world objects in a virtual environment.

The components of the artifact that best demonstrate my skills include:

- 3D modeling: Representing real-world objects such as a desk and monitors using geometric primitives like boxes and cylinders.

- Texture application: Using textures to simulate details on surfaces, such as the wood texture of the desk.

- Scene navigation: Implementing camera controls to allow users to explore the scene interactively.

However, there were areas that needed improvement. For instance, the textures lacked realism, the lighting was not fully representative of how light interacts with surfaces, and the hard-coded transformations made the code rigid and difficult to scale. To address these, I transitioned from OpenGL to Blender, an advanced 3D creation suite, which allowed me to implement several key enhancements:

- High-resolution textures: By using Blender's UV unwrapping, I applied more realistic textures, such as a detailed lavender wood texture for the desk and clearer, more engaging monitor displays.

- Lighting and shadows: With Blender’s global illumination, I added accurate lighting and shadows that enhance realism, making the scene more visually appealing.

- Improved interaction: I added animations like slight movements of the chair when the camera is moved around, using Blender’s more advanced animation tools.

These improvements made the artifact much more professional and representative of industry-standard graphics applications, showcasing not just my technical skills but also my adaptability in using new, more powerful tools.

3. Did you meet the course outcomes you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?

Yes, I successfully met the course outcomes that I had planned to achieve during the enhancement of this artifact. Specifically, I demonstrated my ability to:

- Apply principles of software engineering by transitioning the project from OpenGL to Blender, a tool better suited for managing more complex graphics and scene development. This transition reduced the overall complexity of the code and made it more modular and maintainable.

- Develop and manage visual environments through improvements in the realism of textures and lighting, creating a more immersive scene.

- Create interactive applications by enhancing user navigation and interactions within the scene, improving the overall user experience.

At this point, I do not have any major updates to my outcome-coverage plans. The enhancements I made align with the intended learning outcomes, particularly in terms of improving my proficiency with advanced tools and techniques for creating visually complex and interactive 3D environments.

4. Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?

Enhancing and modifying the artifact was a valuable learning experience that allowed me to grow both technically and creatively. One of the most significant things I learned was how to effectively transition from a code-heavy framework like OpenGL to a more visual, user-friendly platform like Blender. This transition not only improved the visual complexity of the scene but also allowed me to focus on higher-level design aspects such as lighting, texturing, and user interaction, rather than spending time on low-level coding tasks.

A key challenge I faced during this enhancement process was learning the intricacies of Blender’s interface and toolset. While Blender offers powerful capabilities, the learning curve for mastering its features, such as UV unwrapping and global illumination, was steep. However, once I became more familiar with the tool, I was able to leverage it to achieve much higher levels of realism and interactivity than I could with OpenGL alone.

Another challenge was ensuring that the enhanced project remained modular and adaptable for future updates. This was an important goal, as one of the limitations of the original project was its reliance on hard-coded transformations. By using Blender’s structured approach to scene management, I was able to create reusable components, making the project more scalable and easier to maintain.

Overall, this process taught me the value of using the right tool for the right job. While OpenGL is excellent for learning the fundamentals of 3D graphics, Blender's advanced features and intuitive interface made it the better choice for creating a more polished and professional artifact. This experience improved both my technical skills in 3D modeling and design as well as my ability to adapt to new software environments, an essential skill in software development.

In conclusion, the enhancements to this artifact have resulted in a stronger, more polished project that demonstrates my growth in software engineering and computational graphics. This improved version will be a key addition to my ePortfolio, highlighting both my technical capabilities and my ability to use industry-standard tools for high-quality software development.