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CSCI-UA 480

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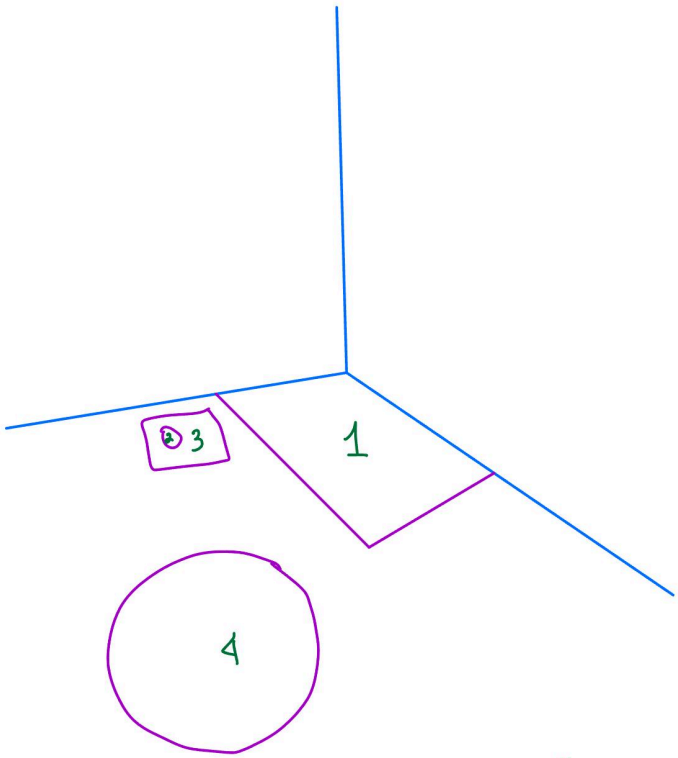
Assignment 4

1.1 A sketch of your scene



(1) Bed w/ mattress, blankets, pillows

(2) Drinking glass

(3) Night stand

(4) Rug

My scene is the corner of a bedroom, and shows the bed (i.e. bedframe, mattress, blanket, and pillows), nightstand (beside the bed), drinking glass (on top of the nightstand), and rug (closest to the viewer, in front of the furniture).

1.2 Create one object that you listed for your scene from scratch

Above is the rendered image of a bed that I created from scratch in Blender, following a YouTube tutorial (Bed Tutorial). To begin, I added a cube and scaled it to form the base of the bed, adjusting its dimensions to achieve realistic proportions. Next, I created the headboard by extruding a face from the back of the base and scaling it to the appropriate height and thickness. For the pillows, I used additional cubes, scaled them down, and applied a Subdivision Surface Modifier to smooth their geometry. I further modified their shape using proportional editing to give them a natural, fluffy appearance. To create the bed cover, I added a plane above the bed, subdivided it for additional geometry, and applied cloth simulation to drape it over the base, resulting in realistic folds and wrinkles.

1.3 Place another object that you listed for your scene

In the rendered scene above, I have added a nightstand (Nightstand) to complement the bed that I created from scratch. The nightstand contributes to the scene by enhancing its realism and storytelling. It adds depth to the composition, suggesting a functional and livable bedroom space. Additionally, its placement next to the bed follows conventional bedroom layouts, making the scene more relatable.

1.4 Add appropriate BSDF materials to your objects

Since the last step, I added another object: a glass on the nightstand (Glass) For the blanket, I used a Glossy BSDF material to simulate a smooth, reflective surface, highlighting its satin-like texture and creating an eye-catching effect. The pillows were assigned a Sheen BSDF material to replicate the soft light scattering characteristic of fabric, giving them a realistic and cozy look. For the glass on the nightstand, I chose a Glass BSDF to accurately represent its transparency and reflective properties.

The Principled BSDF material was applied to the nightstand and the bed frame for their versatility in simulating realistic materials. Unfortunately, I forgot to turn on 'Cycles' at this stage, but it will be on for the screenshots starting in 1.6.

1.5 Add lighting to your scene

Since the last step, I added a rug to be laid out in front of the bed (Rug) as well as flooring and walls to enclose the space. In this step, I experimented with darker lighting to show what the bedroom would look like at night time. To do this, I lowered the brightness of the lights and made them more yellow. I also added area lights above the head of the beds. For the next steps, I increased the lighting to better show the entirety of the scene.

1.6 Add an advanced feature to your scene

To implement an advanced rendering technique in my scene, I chose to enable denoising to improve the quality of the final render. By activating the Denoise options, I was able to significantly reduce the graininess and noise that typically occurs during rendering, especially in areas with subtle lighting or reflective surfaces. Additionally, I increased the sample count to ensure that the denoising algorithm had sufficient data to create a smooth and polished final image.

Denoising helps bring out the fine details in my scene, such as the smooth texture of the blanket and the reflective properties of the glass object on the nightstand, without the distraction of noise artifacts. This enhancement complements the lighting setup and material choices, allowing the render to appear more realistic and visually cohesive. Using this technique ensured that the final

render matched the envisioned scene, with clean and high-quality visuals that showcase the materials and lighting effects effectively.

1.7 Measure your rendering time

Minimum Sample of 16, 540 Pixels: 1:52.49

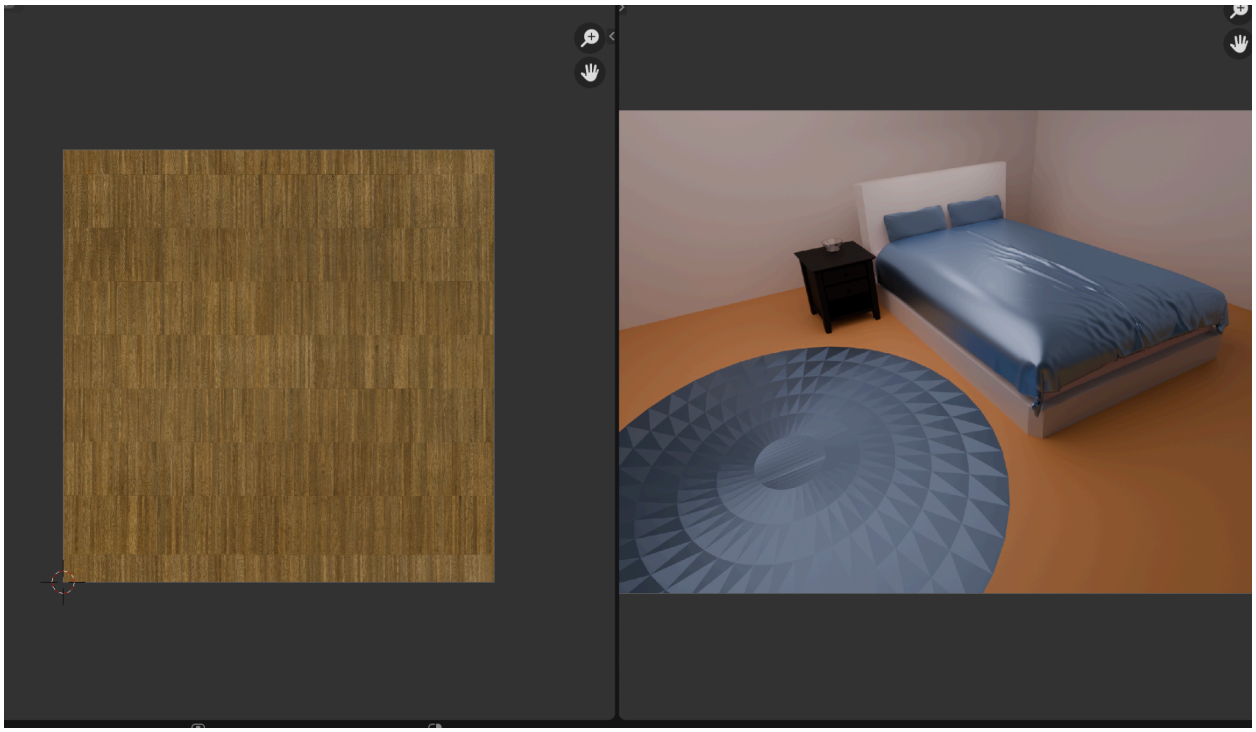
Minimum Sample of 30, 1080 Pixels: 7:26.06

For the first test, I set the sample count to a minimum of 16 and the short edge resolution to 540 pixels. This render took 1 minute and 52.49 seconds to complete, producing a relatively quick but lower-quality result, with some visible noise and less definition in finer details.

For the second test, I increased the sample count to 32 and doubled the short edge resolution to 1080 pixels. This render took significantly longer, at 7 minutes and 26.06 seconds, but resulted in a much cleaner and more detailed image. The increased sample count and resolution allowed for better light sampling, smoother textures, and sharper details across the scene, especially in reflective and fine-textured areas like the blanket and nightstand.

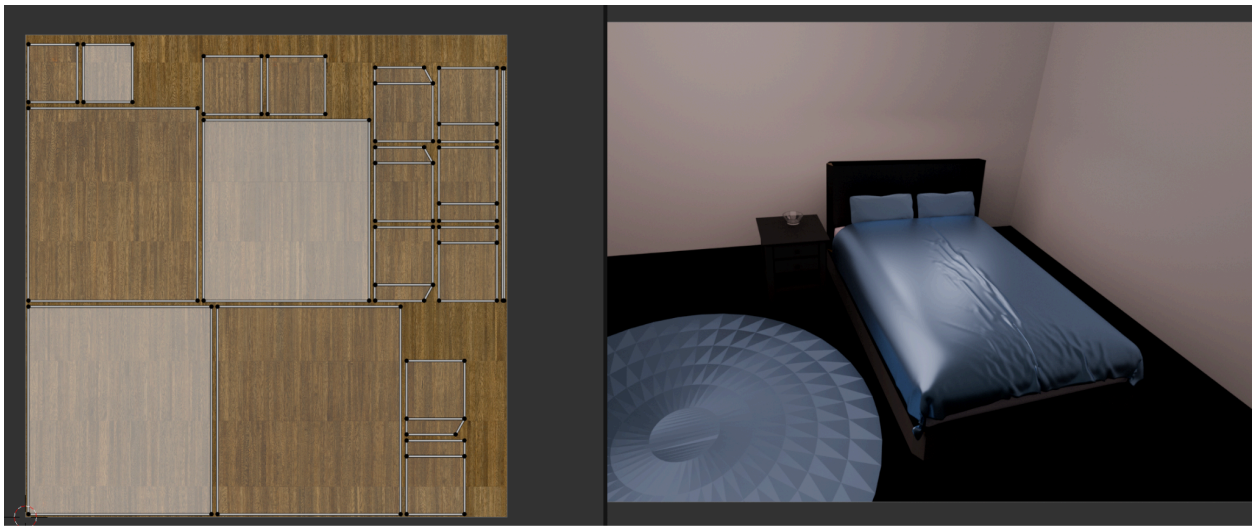
This information helps me gauge the limits of my hardware and plan for rendering more complex scenes in the future.

2.1 Texturing Deliverable



Above is the UV unwrap of the bed frame (a rectangular base with a 90-degree rectangular headboard attached to it). To create the UV map, I used the Smart UV Project feature in Blender.

For the material, I applied a base color texture of a wooden finish to the bed frame, which gives it a realistic, polished wood appearance (Floor). (SIDE NOTE: I also added this same texture to the floor to test before adding it to my object. That is why they now look more similar). To add depth and detail, I utilized a noise texture map connected to a bump node to simulate subtle surface imperfections and grain patterns (this is illustrated in the final rendered image at the bottom of the PDF). This creates the illusion of roughness and adds realism to the material without altering the geometry. The combination of the UV map and the procedural noise texture allowed me to create a natural and believable wooden material for the bed frame.



Above is the UV unwrap of the nightstand, which I selected as one of the objects to UV unwrap and enhance with textures. Initially, I applied a displacement map to the nightstand's surface, but I noticed that the changes were minimal and did not visually stand out in the rendered view. To address this, I modified the material texture to a bamboo texture, which provided a more

pronounced and realistic effect on the surface of the nightstand (New Texture). This adjustment allowed the displacement map to showcase subtle details and enhance the realism of the object. The below-rendered image demonstrates the improved appearance with the updated bamboo texture, creating a more textured and natural look that complements the overall scene.