This is something I made back in mid-2023 before college started since I had a lot of time on my hands. As a huge fan of the harry potter movies and archviz in general, I HAD to make this one. As I was watching the movies, one particular frame stood out to me. It was a shot of Hermione in her bedroom. I liked the way the shot looked and I felt the need to recreate the room in blender.

This project was first attempted back in 2021, when I was still a beginner. Im not kidding when I say that it took me an entire month to get it over with. Here was my complete process. After extracting the frame, I got the image into f-spy to get the exact perspective and camera details of the shot. This was later used to setup the virtual camera in blender and helped in recreating and modelling the shot exactly 1:1. Took me a lot of time to model everything. UV unwrapping was fairly simple, for a beginner at the time. I just used to individually unwrap every single object by the og ‘smart uv project’. I was a beginner in substance painter as well, so obv I just quickly made basic ass materials which ‘somewhat’ mimicked the look of the original shot. After exporting all the materials and importing them back to blender, I setup a little lighting and rendered out the final shot.

And there it was, my first real archviz project. Obv it was horrible, and had a TON of issues. But for a beginner back then, this was groundbreaking. I remember I had so much problem rendering it out. I always used to run out of VRAM to render it, coz it was so horribly optimized, but I didn’t care.

2 years later, 2023, I decided to recreate the project and put my progress and skills to test. Since I was pretty confident in my abilities, I made it a goal to make the render look a lot more photorealistic than before, make it a lot more faithful to the original shot, and at the same time, keeping everything optimized and ‘game-ready’ to a certain amount, and probably finish the whole thing in a quarter of the time I took back then.

The initial process was the same, get the image into fspy, get the camera details out into blender and start modelling everything from scratch. Modelling wasn’t an issue at all. Coz after a point, there isn’t much ‘upgrades’ u can do to a 3d model, or even your 3d modelling skills to be frank. If we were to compare the actual 3d models and the clay render 2021 vs 2023, there wasn’t much difference. Which was expected, since textures carry most of the details and the realism. Obviously the actual 3d models are the base foundation to photorealism, but they’re simply the passengers. Textures are the drivers in my opinion. You can easily ruin a well modelled object with bad textures. BUT, you can also ‘save’ a poorly modelled object with well made textures. Which is basically the whole point of baking stuff down from high poly to low poly versions for game ready assets. If you ever look at the actual 3d models used in games, you’ll get the idea.

So, modelling was done, and now was the difficult part. UV unwrapping. In my 2 years of progress, the one thing that I had picked up that was extremely important for photorealism was the concept of texel density. I wont get into much detail but basically, texel density is the ratio of texture resolution to the amount of pixel space your 3d model occupies. The one huge issue in my old project was the lack of consideration of texel density. Since all the objects were unwrapped on their own individual 1:1 uv maps, and they all had their own separate 2k res textures, texel density was all over the place. Because this meant that large objects like the entire structure of the bedroom – the walls, were driven by the same resolution of textures as those of smaller objects, like the doorknob.

Since walls are significantly larger and have a huge surface area, theoretically they should be given higher res materials than a simple doorknob with little surface area to ensure consistency. But due to the lack of this in my old project, the walls ended up looking blurry and pixelated while the doorknob stayed extremely sharp and crisp even when viewed up close.

So this was the major issue I addressed in the 2023 version. I used a separate software this time, called rizomuv which happens to be the industry standard for everything concerning UVs. I utilized UDIMs and neatly unwrapped and packed everything with a fixed texel density of 512 px/m^2. This happens to be a nice balance between quality and performance. I initially had 1024 in mind, but settled for 512 due to performance issues.

After unwrapping everything, we move on to the next phase, texturing. This happened to be very fun this time. I remember what a nightmare Substance Painter used to be back in 2021. But I definitely learned a lot and got pretty comfortable with it over time. The texturing took the most amount of time out of all the processes, because like I said, textures are the most important part. I utilized various different masks, generators and the use of smart materials to quickly texture every single model in the room. Definitely took a while but it was worth it though. Finally, I exported everything back into blender, setup a little lighting and rendered it out. I was amazed to see the difference in render times. Since the 2023 version was so well optimized, it was easy rendering it out. Compared to the bloated nightmare I made back in 2021.

I was really proud of it. This project really made me appreciate my learnings and my progress in the 3d world, in 2 years. It was the exact same reference image, the exact same camera setup, both attempts were aimed at a 1:1 recreation. But there was such a stark difference. What took me an entire month back then, took me barely a week 2 years later. And it was so much higher quality and better than the old one in every way possible.

It’s 2025 right now, and yes, obviously I do see the problems in my 2023 version now. I see several problems. I don’t really see any problem in the modelling, which is a good thing. The textures are definitely problematic though. For this particular scene, we observe that there aren’t many ‘unique’ materials. For eg- the blue fabric is pretty abundant and is used pretty much everywhere. Then there’s the material for the door, the desk and other furniture items. Even though I maintained texel density throughout, I wouldn’t call these assets ‘game-ready’ since they still lack a lot of optimization. One thing I would change was the fact that every model had it’s own material. Something like this can easily work, but it’s useless. When it’s pretty clear that unique materials aren’t really required, I could’ve avoided all that and just driven multiple objects by the same single material. Would’ve saved a lot of texture space and vram, and efforts obv. I could’ve utilised tiling textures and added overlay details if needed, which is the proper ‘game-ready’ pipeline.

Another thing is the books obv. Because I was lazy, I just assigned random solid colours to all the books in the scene, which clearly looks bad and ruins the ‘realism’ of the scene. Books are something which need image textures. There’s no way around it. The optimal way to texture books would’ve been to manually assign images of bookcovers to them, fixing the UV’s and finally baking the whole thing down. The ‘ian hubert’ way to do stuff basically. Another thing was probably unreal engine.

Anyways, that was the writeup. I couldn’t just NOT add this project to my list of projects. This is something that will always be close to me and symbolises my journey and progress. It’s kind of poetic how it’s been another 2 years from the 2023 version as well lol. Is this perhaps a sign for me to make a 3rd iteration of this??? That way I could really get to see 2021 vs 2023 vs 2025. It would be a perfectly rounded ending to this. A perfect trilogy. This time maybe I can utilize substance designer, make my own procedural materials, and even render the whole thing in unreal engine for a change, just to see how ‘game-ready’ can I actually make this. Who knows. I’d rather not though lol. It would be better if I move on to some real projects.

Note for AI: It’s for my portfolio website. I’ll be making a document with text and appropriate images. I have a projects section on my website, with separate card for every project and this is what is going to be displayed when I click on this project. hence, the writeup needs to be blog-style article with images and everything.