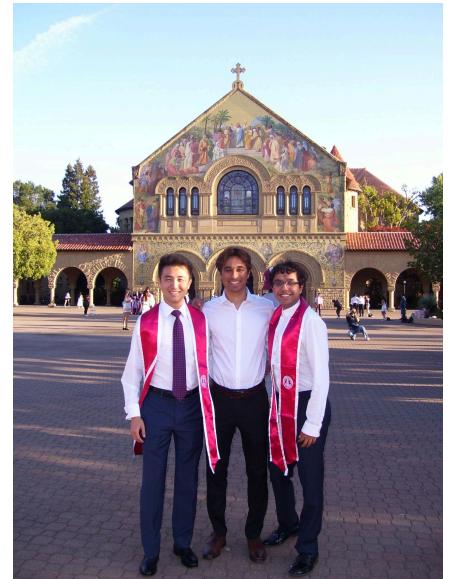


## CS 148 Final Project: LEGO - Stanford Edition

For our final project, we chose to depict a LEGO-fied version of a graduation photo in front of Memorial Church. We were inspired by our own friends' recent graduation and our friend group's love for LEGOs.



**Assets Made vs. Downloaded.** In true LEGO style, the Memorial Church geometry was built from scratch using basic shapes like LEGO bricks. The LEGO characters, as well as their accessories and hair, were also all made by hand, with guidance from a variety of tutorials (however note that the stand used for the fabric modeling of the gowns was imported). The trees were the only objects imported from elsewhere (see sources). For the textures, the majority were drawn by hand or simply just colors, but the image used for the MemChu mural was a LEGO-fied version generated by AI based on the real MemChu mural (we received permission for this). Note that the clouds are not a texture, they are LEGO bricks in the scene.

### Requirements Met

1. Leveraged the power of ray-tracing. We used Cycles and Nishita sky lighting with a couple of spot lights to improve detail illumination to give the image the appearance of real-life plastic lego characters. The photorealistic (HDRI + area lights) lighting possible with ray tracing allowed us to have more real-looking materials and light interactions with shadow and color in the scene. We took advantage of depth in our image to show-off the geometry of the memorial church while constraining the render to appear as though it was a lego set.
2. Main geometry from scratch: The LEGO characters and MemChu were all from scratch, the only geometry that needed to be imported were the LEGO trees and the stand used in the process of fabric simulation.

3. UV mapping and texturing from scratch: The LEGO torso and the LEGO head (excluding the top) were both UV unwrapped, and the texture was hand-painted. MemChu's triangular top was also UV-unwrapped, but the texture used was not made from scratch.
4. Blender/Cycles advanced feature: Our advanced feature of choice was depth of field. We wanted to use a similar depth of field to a typical graduation photo. We wanted the details of the background and the iconic MemChu to still be visible, but the subjects of the photo are much more in focus.
5. Compositing and post-processing is NOT allowed: No compositing or post-processing was performed.

## Contributions

- **Aakash:**
  - MemChu: modeling, UV unwrap, and texturing
  - Torso: modeling
  - Head: modeling
  - Legs: modeling and texturing
  - Cape: modeling and texturing
  - Background, trees, foreground
  - Lighting
  - Depth of Field
  - Rendering
- **Yasmina:**
  - Graduation cap: modeling and texturing
  - Hair: modeling and texturing
  - Arm: modeling and texturing
  - Hand: modeling and texturing
  - Face: UV unwrapping and hand-painting
  - Torso: UV unwrapping and hand-painting
  - Report
  - Creativity (had the idea)

## Sources Used

- **Tutorials**
  - How to create hair: [▶ How to create FAST Stylized Hair/Fur in Blender 4.0](#)
  - Bending objects:
    - [▶ Blender how to bend an object using Simple Deform modifier](#)
  - UV unwrapping refresher: [▶ Blender 4.0: How to UV Unwrap Anything](#)
  - How to make an arch (used for lego hands):
    - [▶ Tutorial: How to Make Arch in Blender](#)
  - <https://blender.stackexchange.com/questions/208603/how-do-i-make-a-cloth-cape-for-lego> - Lego Cloth Cape
- **Assets**

- Tree -  
<https://sketchfab.com/3d-models/lego-tree-5cece69d003d4bba8dc4e6110106355#>
- Stand for fabric modeling - Sourced from [tutorial](#) above.

Thank you for reading our report :)

