Dataset of Simulated Cloth-Object Interactions

Overview

This dataset comprises 100 object files and 100 corresponding cloth simulations, designed to offer a realistic portrayal of cloth-object interactions. It is tailored for various recognition tasks and offers a high degree of realism in cloth physics.

Features

1. **Wide Variety of Shapes**: Our dataset includes a diverse range of object shapes, offering extensive opportunities for training and testing recognition algorithms across different scenarios.
2. **Everyday Item Focus**: The objects in this dataset represent everyday items, making it highly relevant for practical applications in object recognition and similar tasks.
3. **No Clipping Issues**: We have ensured that there is no clipping in any of the cloth or object files, providing clean and accurate data for your analysis.
4. **Realistic Cloth Physics**: The cloth simulations in this dataset have been crafted with attention to realistic physics, ensuring that the interactions and draping are as true-to-life as possible.
5. **Floor-Included Design for Realism**: Initially, objects include a floor to simulate a more realistic cloth interaction. However, for usability and clarity, the floor is removed in the final files. This ensures that the focus remains solely on the cloth and object while retaining the realistic dynamics influenced by the floor.
6. **Small File Sizes:** Despite the provided realism, the file sizes are rather small at around 600 MB for the 200 objects.

Main Configurations for Cloth Simulation

- As previously mentioned, a Floor plane was included to render the object placed on the floor.
- Upon experimentation, we discovered, that enlarging the object for rendering the cloth simulation resulted in not just faster processing but also enhanced accuracy.
- Following a suggestion from another student, we optimized outcomes by disabling culling in the collision physics of the object.
- We settled on 170 cuts for the cloth, striking a balance between revealing object details and maintaining performance efficiency.
- The main part of our computing resources was directed into the collision and cloth quality.
- Bending stiffness was adjusted to 5, ensuring the cloth exhibited the desired number of folds.
- For downscaling the cloth, to fit to our unit size object, we needed to first export the cloth, before scaling it down, as the cloth else would have lost its shape.
- We iterated through various settings for the remaining cloth parameters until we achieved a configuration that met our expectations for cloth behavior.