INFO6022 - Physics 2

Project #4: Soft Body Simulation

Due Date: Sunday, March 15th 11:59PM

For this project, you will simulate a soft body object using a ball-and-spring model. There will be also be several rigid body objects in the scene that can be controlled by the user to interact with each other, and the soft body.

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|  | Item | Marks |
|  | **MUST HAVES: ( Just do it, or you get zero ☹ )**  **Remember your ReadMe file (\*.txt, \*.docx, or \*.md)**  **This ReadMe file must be included inside your submission!**   * **Add all group member names** * **Build instructions** * **User controls (these should match the project description)** * **Information about all graded items you have accomplished**   **All the “MUST HAVES” and full project requirements of “Project 2: Spheres!”**  **…**With one difference: There’s a soft body in there! |  |
| !! | **Up to -5 marks for ugly code!!!** … So what is ugly code?   * Bad or inconsistent formatting, indenting, and spacing. * Poor naming choices. Eg. “param5” “temp3” “MyClass” “v1, v2, v3, v4, v5, v6” names should be *accurately* descriptive. * No comments. * Inaccurate comments. * Unused/misusued/abused variables or objects. * Ugly polymorphism. * Rampant commented out code. |  |
| 1 | You have a soft body object in your scene that is a vertical ‘cloth’. Your cloth MUST be positioned such that it can be interacted with by taking control of one of your free spheres and driving into it.  The cloth is reasonably configurable (such as… key node positions, node mass).  The cloth hangs as though it has weight. However, when interacting w  ith anything it should move weightlessly. Ie. It just gets pushed out of the way when things run into it.  5 marks for the overall implementation – configuration, loading, classes/structs.  5 marks for the inner workings of your cSoftBody - the implementation of a ball-and-spring model based on Hook’s Law.  5 marks for how good the final product looks. | 15 |
| 2 | A Broadphase, such as AABB vs AABB, is implemented to optimize collision handling between your soft bodies and rigid bodies. | 2 |
| 3 | Wind! There is a wind force applied to the cloth. The wind only has to apply to the cloth nodes, and must be a reasonable, limited, and bounded force that varies smoothly over time. | 3 |
| 5 | **BONUS:** There are two rendering options for your soft body object that can be set using the number keys 1 and 2   1. Each node is seen a sphere. (optionally rendering the ‘springs’) 2. The soft body is rendered as a smooth material. It has a corresponding mesh, with the vertices being dynamically updated each frame. | 2 |
|  | TOTAL: | 20 + 2 |