Scientific Computing

Assessed Coursework 2 – Mass-Spring Model for Cloth Simulation

Due Date: 5th, January 2019

Description

Enhance a cloth simulator that is based on mass-spring model by adding improved integrators. The basic simulator program with two integrators, Euler and Midpoint, will be provided. You should incorporate integrators based on: (1) Heun's method with iterations (*propose stopping criteria*), (2) Runge-Kutta order 4, and (3) Adaptive RK methods with step halving.

You will be provided with the starter code where you will be adding your new code mainly to the CPhysEnv class.

To launch the simulation, use the attached OpenGL library and follow the instructions in readme.txt to link OpenGL with Visual Studio.

Deliverables

You will need to electronically submit the source code for the project including your implementation files as well as a functional executable.

A ***detailed report*** is to be submitted and should explain how the program works and include justifications on how the new integrators lead to improved simulations. You will need to provide comparison of used integrators and propose metrics for error. You should also investigate the **effect of modifying the step size and spring stiffness (spring constant) on simulation behaviour and stability for each integrator**.

Criteria for grading this coursework include **code understanding**, report details & quality, correctness and efficiency.