

# Assignment 4 : Rigid Body Simulation

NAME: GE TIANYANG

STUDENT NUMBER: 27869265

EMAIL: GETY@SHANGHAITECH.EDU.CN

## 1 INTRODUCTION

The main part of the rigid body simulation is the collisionDetect and update the velocity and position.

## 2 IMPLEMENTATION DETAILS

1. F() function. It needs to be done before stateNumInt() function. In this function, compute force(the sum of vertex force). Then compute torque by equation return rigidStateDot.

2. stateNumInt(). compute new rigidstate by plus the  $F \cdot h$ , for accurate result, i represent

$$F = 0.5 * (F(0) + F(h))$$

Then, update new center and new position.

3. collisionDetect(). There are three states:

### 2.1 $< \text{DepthEpsilon}$

decrease the current delta t and update vertex position and velocity

### 2.2 $\geq \text{thr}$

do the update process using original delta t.

### 2.3 $< \text{thr}$

Count and jump to Resolvecollision() handling colliding contact. If count>5, set velocity to 0.

## 3 RESULTS

There is a mp4 in the file.