COMP559 A2   README

Submission by Agnes Liu (stid: 260713093)

/src

//all source files modified

/datalcp

/skittles.png //my new scene image
559A2_demonstration_movie.mp4 //demonstration video

This is the result I had for the factory:

Agnes Liu
datalcp/tetrisTube.png factory
bodies = 1005
contacts = 24367
2021/02/23 00:33:44
simulation time = 451.5000000000684
total compute time = 172.84894279999983
compute time = 0.0696502
collision detection = 0.0172676
collision processing = 0.0516555
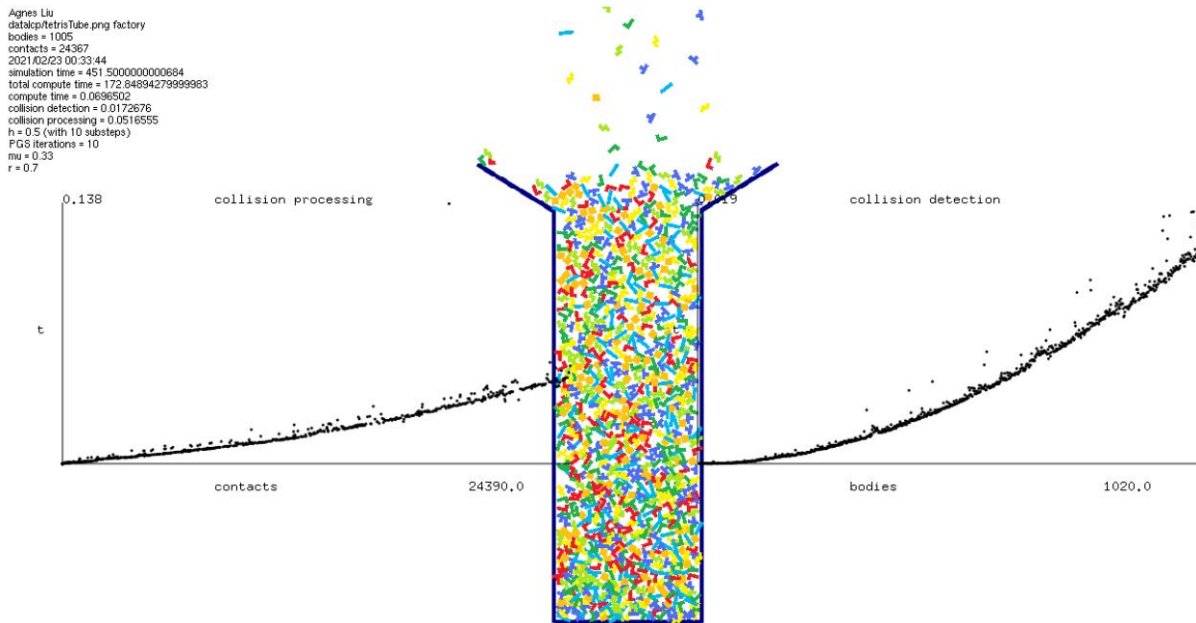h = 0.5 (with 10 substeps)
PGS iterations = 10
mu = 0.33
r = 0.7

Figure 1. Factory with LCP solver, using BVTree, with randomization and Warm Start applied

I noticed from here as well in other videos (all required elements assembled in the demonstration video) there is still interpenetration, but have identified that without randomization and/or warm start the situation was worse:

Agnes Liu
datalcp/tetrisTube.png factory
bodies = 1318
contacts = 120017
2021/02/23 02:55:00
simulation time = 526.5000000000512
total compute time = 245.21348029999996
compute time = 0.1291377
collision detection = 0.0430009
collision processing = 0.0852619
h = 0.5 (with 5 substeps)
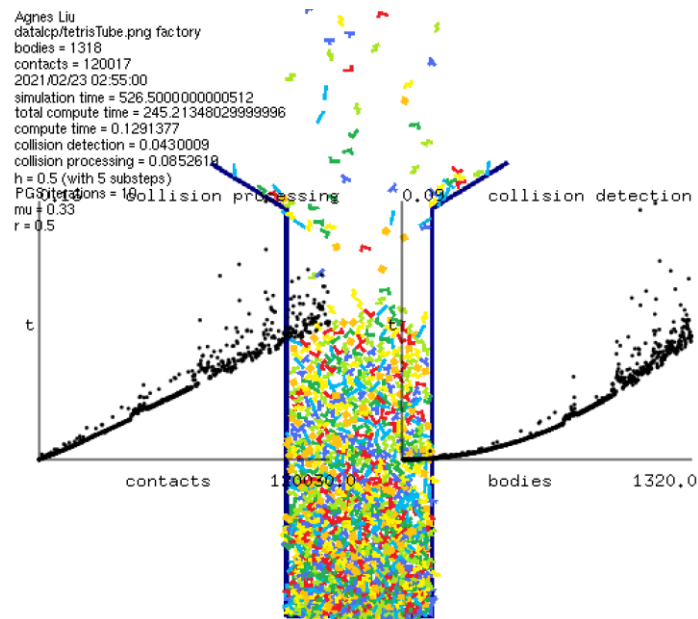PGS iterations = 10
mu = 0.33
r = 0.5

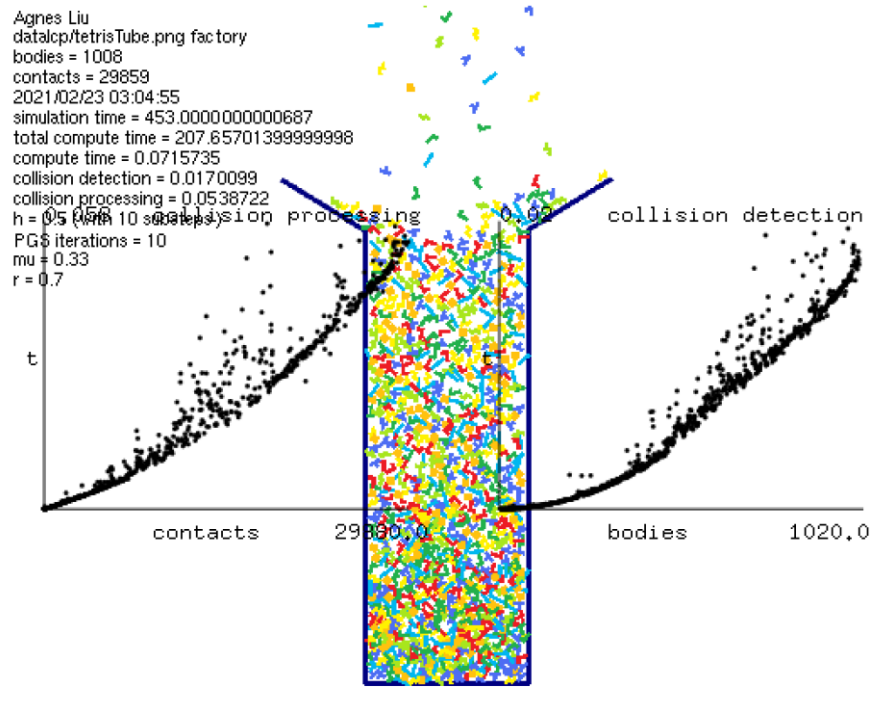Figure 2. Without Randomization and warm start

Figure 3. Without Warm Start

With Randomization and Warm Start the number of contacts dropped from 120,000 to 24,000. I am not sure how well the performance of PGS should be without contact pruning and upgraded time stepping, but the implementation of PGS was strictly following hints from lectures and the Erleben 2007 paper.