

15-464 / 15-664 Reference List for 2/17/2015 lecture

## Intro to building a physically based simulator

Andrew Witkin and David Baraff, "Physically Based Modeling: Principles and Practice," Siggraph '97 Course notes. <http://www.cs.cmu.edu/~baraff/sigcourse/>

You can find a clear writeup about the spring mass system's behavior and a reminder for how to solve those differential equations here:

Allen, Brian F., and Petros Faloutsos. "Misconceptions of PD control in animation." In *Proceedings of the ACM SIGGRAPH/Eurographics Symposium on Computer Animation*, pp. 231-234. Eurographics Association, 2012. <http://dl.acm.org/citation.cfm?id=2422389>

How to do PD Control correctly:

Hongyi Xu, Yili Zhao, Jernej Barbič:

Implicit Multibody Penalty-based Distributed Contact *IEEE Transactions on Visualization and Computer Graphics*, 20(9), 2014 <http://run.usc.edu/implicitContact/>

One idea for making contacts soft:

[Controlling Physics-Based Characters Using Soft Contacts](#), Sumit Jain, and C. Karen Liu, in *ACM Transactions on Graphics* (presented at SIGGRAPH Asia), 2011

## Simulation Survey Paper

Ivaldi, S.; Peters, J.; Padois, V.; Nori, F. (2014). Tools for simulating humanoid robot dynamics: a survey based on user feedback, *Proceedings of the International Conference on Humanoid Robots (HUMANOIDS)* <https://www.codyco.eu/survey-simulation>

## Some Simulation References

Open Dynamics Engine <http://www.ode.org/>

Bullet Physics Library <http://bulletphysics.org/wordpress/>

Also check out this SIGGRAPH 2011 course: <http://bulletphysics.org/siggraph2011/>

Karen Liu's RTQL8 <http://www.cc.gatech.edu/~karenliu/RTQL8.html>

Karen Liu's DART <http://dartsim.github.io/>

Emanuel Todorov's MuJoCo has apparently not yet been released? <http://www.mujoco.org/>

Box2D <http://box2d.org/>

Gazebo <http://gazebosim.org/>