15-464/15-664 Reference List for April 14, 2021

The theme for today was simulation of deformable bodies. We started by looking at the following paper:

Dvorožňák, Marek, Daniel Sýkora, Cassidy Curtis, Brian Curless, Olga Sorkine-Hornung, and David Salesin. "Monster mash: a single-view approach to casual 3D modeling and animation." *ACM Transactions on Graphics (TOG)* 39, no. 6 (2020): 1-12. https://igl.ethz.ch/projects/monster-mash/

Inflation and As-Rigid-As-Possible

We followed up with a short exploration of the As-Rigid-As-Possible technique for animation.

Igarashi, Takeo, Tomer Moscovich, and John F. Hughes. "As-rigid-as-possible shape manipulation." *ACM transactions on Graphics (TOG)* 24, no. 3 (2005): 1134-1141. https://www-ui.is.s.u-tokyo.ac.jp/~takeo/research/rigid/index.html

Igarashi, Takeo, Satoshi Matsuoka, and Hidehiko Tanaka. "Teddy: a sketching interface for 3D freeform design." In *ACM SIGGRAPH 2006 Courses*, pp. 11-es. 2006. https://www-ui.is.s.u-tokyo.ac.jp/~takeo/teddy/teddy.htm

Jacobson, Alec, Ilya Baran, Ladislav Kavan, Jovan Popović, and Olga Sorkine. "Fast automatic skinning transformations." *ACM Transactions on Graphics (TOG)* 31, no. 4 (2012): 1-10. https://www.cs.utah.edu/~ladislav/jacobson12fast/jacobson12fast.html

Finite Element

We then took a look at the finite element method, with reference to this paper. Whiteboard notes are attached below. You can find the video from the link that follows the paper reference.

O'Brien, James F., and Jessica K. Hodgins. "Graphical modeling and animation of brittle fracture." In *Proceedings of the 26th annual conference on Computer graphics and interactive techniques*, pp. 137-146. ACM Press/Addison-Wesley Publishing Co., 1999. http://graphics.berkeley.edu/papers/Obrien-GMA-1999-08/index.html

The basic finite element technique discussed in this paper was extended to simulate goop.

Goktekin TG, Bargteil AW, O'Brien JF. A method for animating viscoelastic fluids. InACM Transactions on Graphics (TOG) 2004 Aug 8 (Vol. 23, No. 3, pp. 463-468). ACM. http://graphics.berkeley.edu/papers/Goktekin-AMF-2004-08/