15-464/15-664 Reference List for March 27, 2023

Stable Fluids review – an Eulerian approach

Today we began by reviewing the step by step process for stable Eulerian fluid simulation in this paper:

Stam, Jos. "Real-time fluid dynamics for games." In Proceedings of the game developer conference, vol. 18. 2003. http://graphics.cs.cmu.edu/nsp/course/15-464/Spring11/papers/StamFluidforGames.pdf
https://www.youtube.com/watch?v=t-erFRTMIWA
https://www.youtube.com/watch?v=fFl0FOiR3Nc

This blog page walks through how the 3D effects shown in the second video were created:
https://softologyblog.wordpress.com/2019/02/28/jos-stams-fluid-simulations-in-3d/

Smoothed Particle Hydrodynamics (SPH) – a Lagrangian approach

We then moved on to Lagrangian fluid simulation. The very same year the above paper came out saw the first SPH fluids paper presented at SIGGRAPH. This paper expresses quite clearly the necessary implementation details to produce a realistic looking particle based representation for fluids.

Müller, Matthias, David Charypar, and Markus Gross. "Particle-based fluid simulation for interactive applications." In *Proceedings of the 2003 ACM SIGGRAPH/Eurographics symposium on Computer animation*, pp. 154-159. Eurographics Association, 2003.
https://matthias-research.github.io/pages/publications/sca03.pdf
https://www.youtube.com/watch?v=aaWqybla4r4

If you are interested in more introductory reading to understand the basics, this is a good course:

SIGGRAPH 2007 Course (Introductory)

Robert Bridson and Matthias Müller-Fischer, “Fluid Simulation for Computer Animation”
http://www.cs.ubc.ca/~rbridson/fluidsimulation/