We started out with a recent paper that builds on Eulerian techniques but attempts to minimize dissipation during the projection step.

[https://jzehnder.me/publications/advectionReflection/](https://jzehnder.me/publications/advectionReflection/)

We then turned to this paper which attempted to characterize perceptual differences in simulation techniques

[https://ge.in.tum.de/publications/2017-sig-um/](https://ge.in.tum.de/publications/2017-sig-um/)

As background, we reviewed the various fluid simulation approaches which they compare.

MP and LS methods are due to Nick Foster’s Eulerian approach, with LS indicating a level set method to smooth out and track the fluid surface.

[http://www.cbim.rutgers.edu/dmdocuments/gmip96%20Foster.pdf](http://www.cbim.rutgers.edu/dmdocuments/gmip96%20Foster.pdf)

[https://dl.acm.org/citation.cfm?id=383261](https://dl.acm.org/citation.cfm?id=383261)

PIC and FLIP methods involve switching between grid based and particle based representations to try to obtain the best of both worlds, and are well discussed in these course notes and slides:


The APIC method attempts to conserve affine transformations in the mapping to and from particles and is covered in this paper

[https://dl.acm.org/citation.cfm?id=2766996](https://dl.acm.org/citation.cfm?id=2766996)

WCSPH and IISPH try to solve the problem of simulating incompressibility in SPH fluid simulations efficiently and are covered in the following papers.


**Texturing Fluid**

We briefly looked at this paper on adding texture to a fluid.


**Fluid control**

Next, I spoke about fluid control – how do we coerce a fluid into taking on keyframes. The go-to references are the first two, while the third shows an extension by previous 15-464 students. We talked exclusively about the second of these papers, but the others are included for reference.


**Fluids Motion Capture**

We also looked briefly at using real-world images or 3D point clouds to help guide a simulation. Here are the examples we saw:


**SIGGRAPH 2013 course**

You may find this course interesting:


**Heightfields**

We didn’t talk about procedural water and heightfields, but these are still good techniques to know about for fast water to create some kinds of effects.

Procedural water has a long history as you might expect. I mentioned Darwin Peachey's paper on the topic, which you can find here.


Also check out this paper for procedural waves:


Here is a good explanation of a heightfield technique: