Physically-Based Simulation for Computer Graphics

Project Results: Meteorite strike

Mikael Stellio, Silvia Nauer, Sean Bone
Last time...

Problems with 2D simulation:
- Symmetry
- Stability
- Incompressibility

Don’t you remember?
The problems were:

- Symmetry → wrong indices
- Stability → more PIC on boundary
- Incompressibility → error in pressure matrix

The main problem were **indices** and **typos**!
2D final result
From the 2D to the 3D we had to do:

- Expand our grid in the z-dimension
- Adapt the algorithm to the z-dimension

In order to get a rendered image we had to do:

- Level set function
More bugs

The problems were:

• Symmetry $\rightarrow$ wrong indices

• Level set function $\rightarrow$ wrong implementation!
3D Problems
3D Problems
At the end we have won against bugs!

- Marching cubes (libigl)
- Rendering (blender)

https://r-loops.com/web/uploads/images/entries/600/Music-Rendering-Do-you-know-this-feelin--6675063.jpg
Final video
• Better level set function
• Improve the runtime of our simulation
• Implement smoke and lather
• Implement fluid-solid interactions
Thank you for the attention, any questions?