Physically-Based Simulation

PhysIce

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Simulation Scenario

A powder avalanche tumbles down a mountain in real time on a GPU

Simulation methods

- SPH approach for fluid part, air drag for gaz
- 2 passes (density+pressure, forces+integration+collisions)
- Directx 12 API with compute shader

Milestones

1. Set up c++ game loop (directx 12)
2. Render particles on screen
3. Add starting velocities
4. Particle physics
5. Add collision with heightmap
6. Rendering particles

How we achieved it

- DirectX12 API for interleaving simulation and rendering
- Gridless SPH approach
- Collisions with high precision heightmap

Live Demo