

Physically-Based Simulation

Final Presentation:

Breakout clone

Group: RigidFluid

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Inspiration

- Atari Breakout (1976)
- Inspired a whole game genre:
 - Breakout clones
- Recreate the game in 3D with:
 - spherical obstacles
 - an ellipsoid as cursor
 - liquid explosions upon destruction of obstacles



Image source: <https://en.wikipedia.org/w/index.php?curid=52132637>

Our Solution

- Unity Project
- Rigidbodies and custom collision
- system:
 - Only few necessary object collisions
 - are handled, but efficiently
- Basic SPH fluid simulation:
 - Editable parameters for adaption to computer power

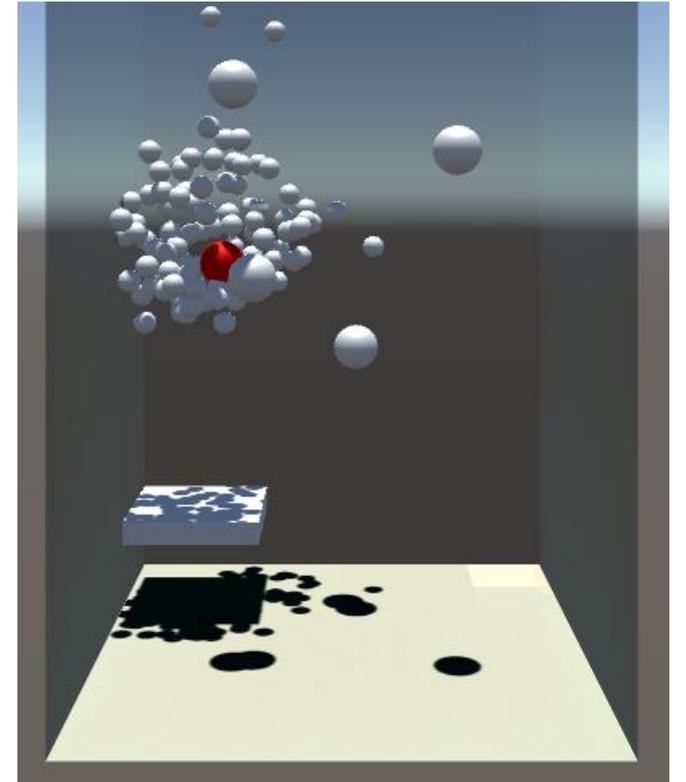
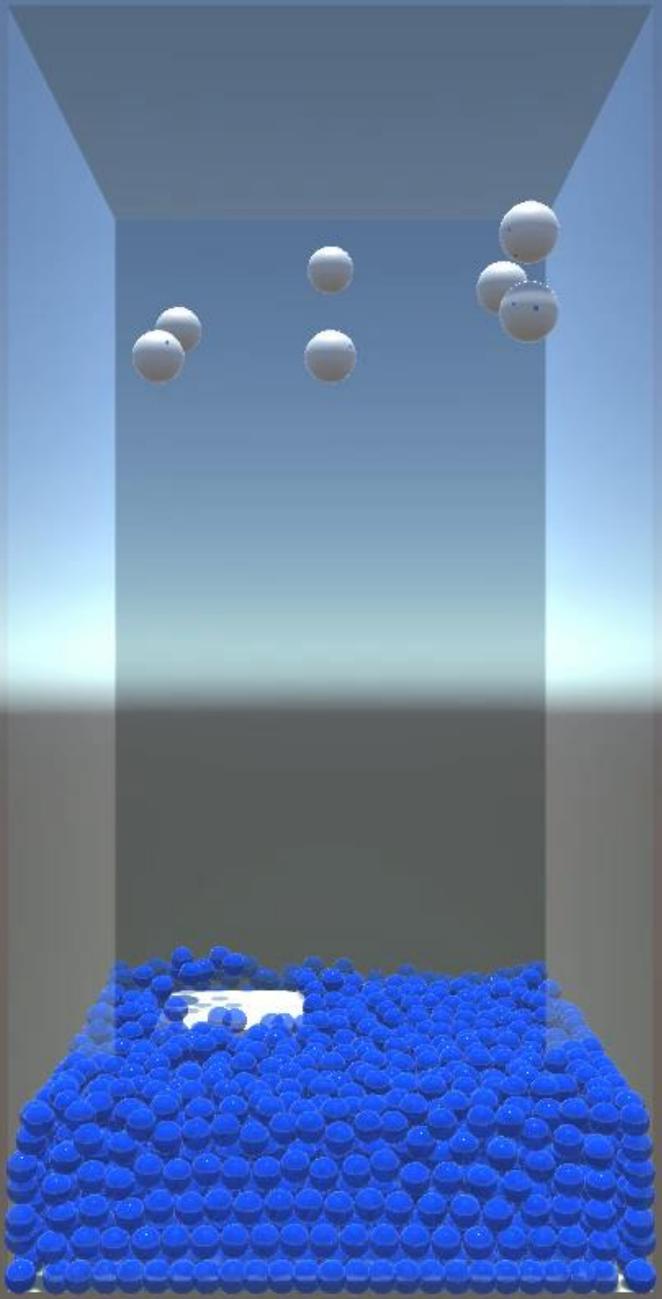
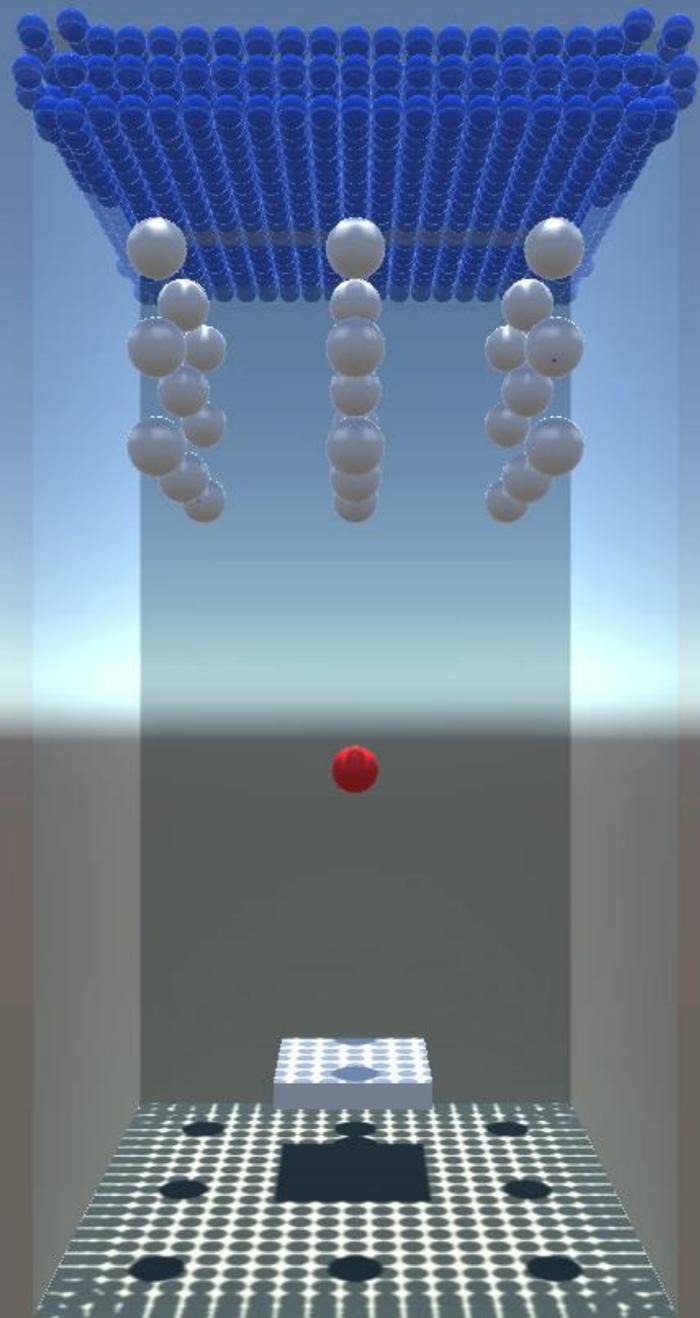
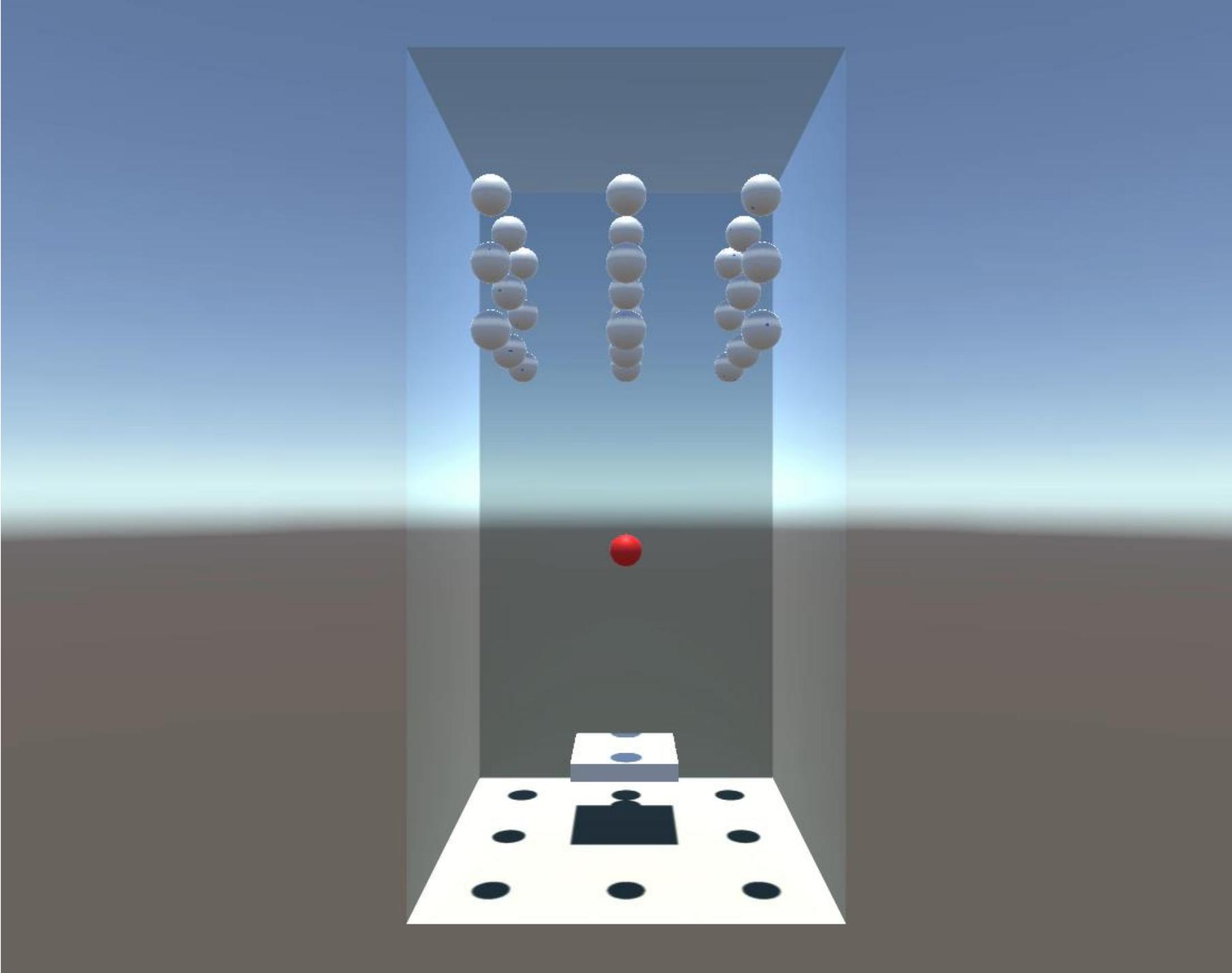
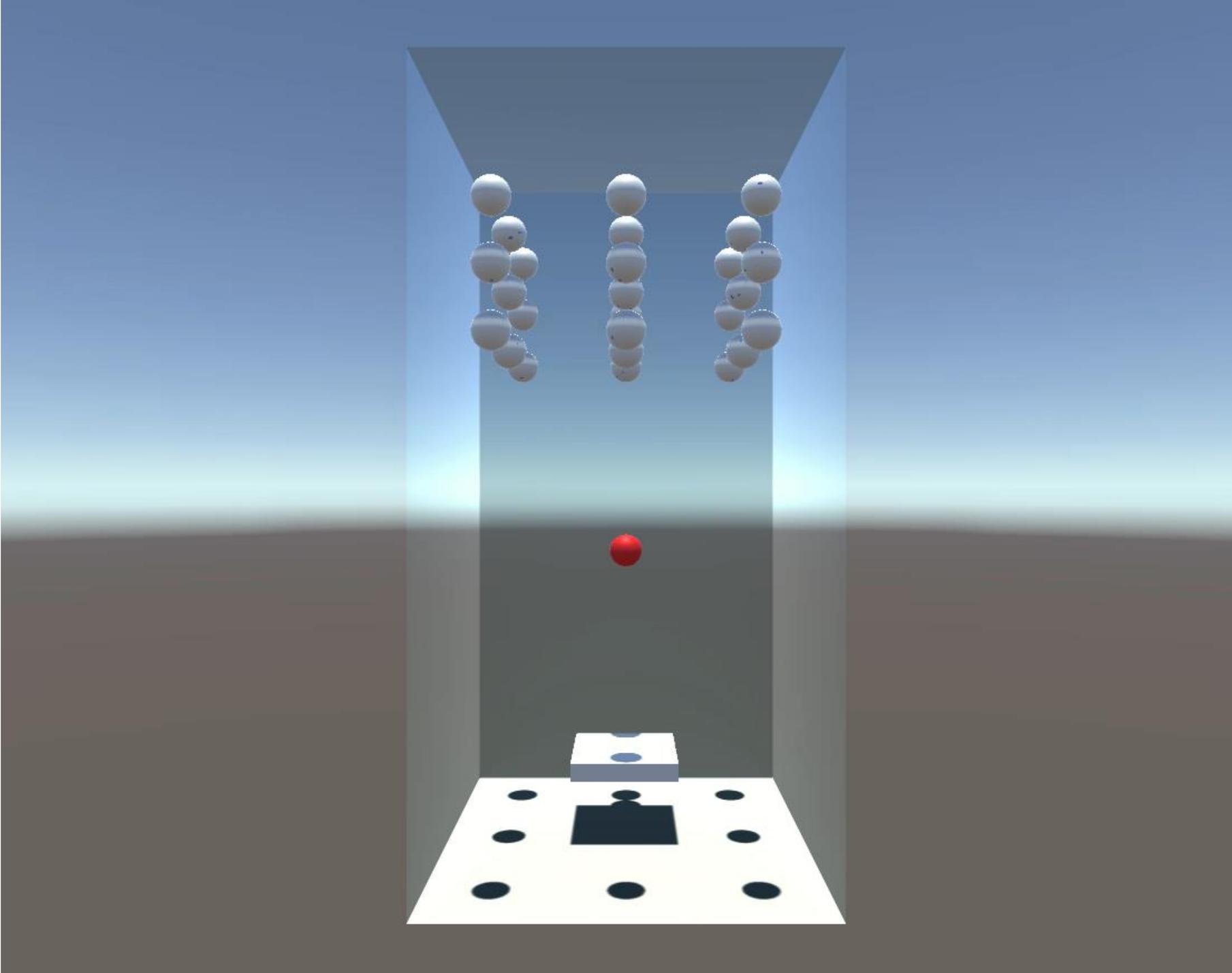


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Minimal Target

- Realistic collisions between the ball, the cursor, obstacles and the walls

Desired Target

- Real-time simulation of the game
- Transitioning the destroyed obstacles to a fluid
 - realistically simulating the fall of the fluid and letting it bounce-off of the other obstacles

Bonus Target

- Falling fluids affecting the ball as well as the cursor
- Nice Graphics

What we learnt in the process

- Unity does not provide most efficient solution for all cases
- SPH fluid simulation
- Merging of Rigidbody and a Fluid World can get hard when not planned through properly