Objective

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- Create a GUI application to present in real-time some functionalities of computer graphics.

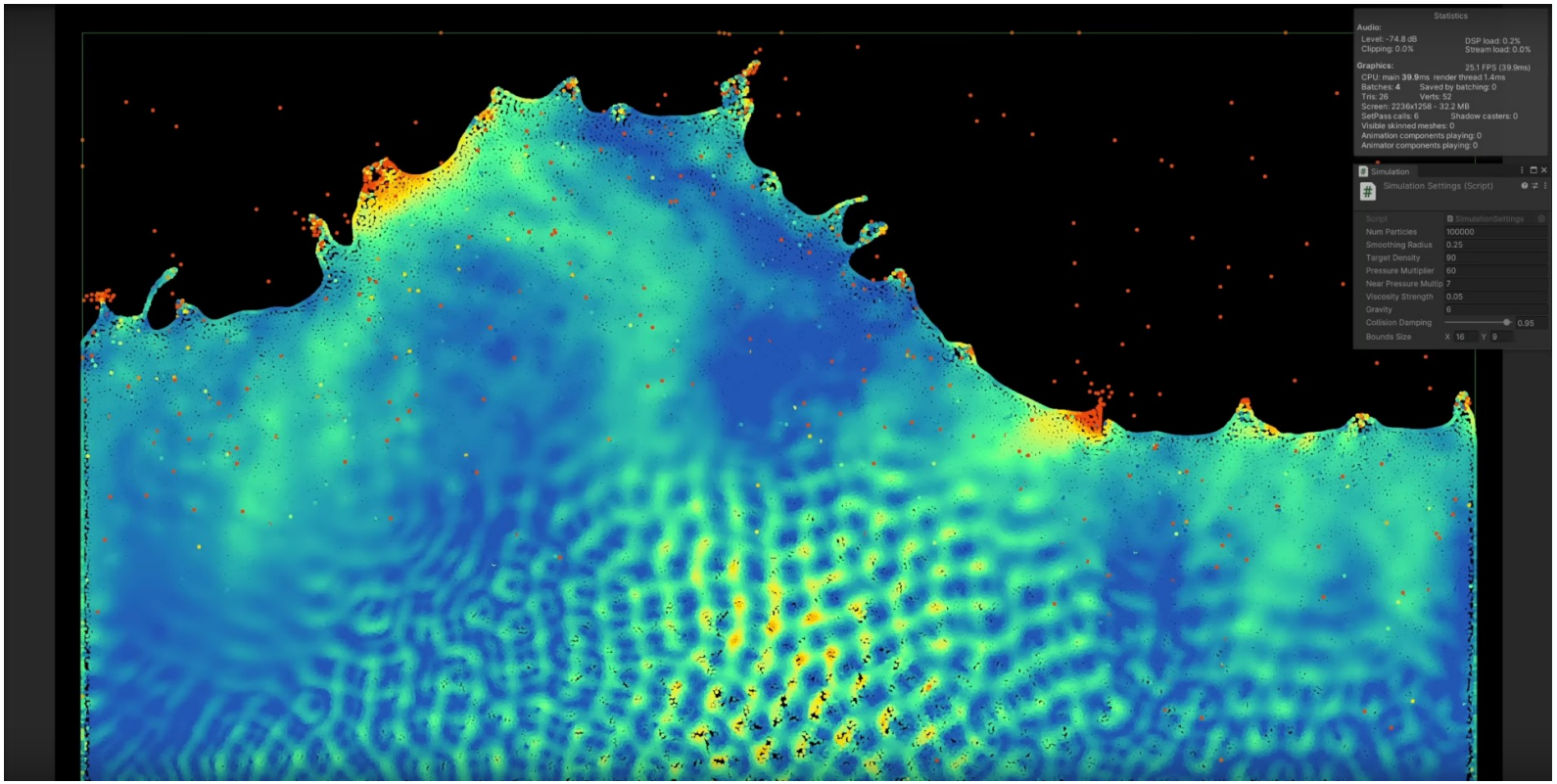

Fig.1 – Main inspiration to this project. Fluid simulation created by Sebastian Lague with interactivity parameters as gravity and fluid density.

Design

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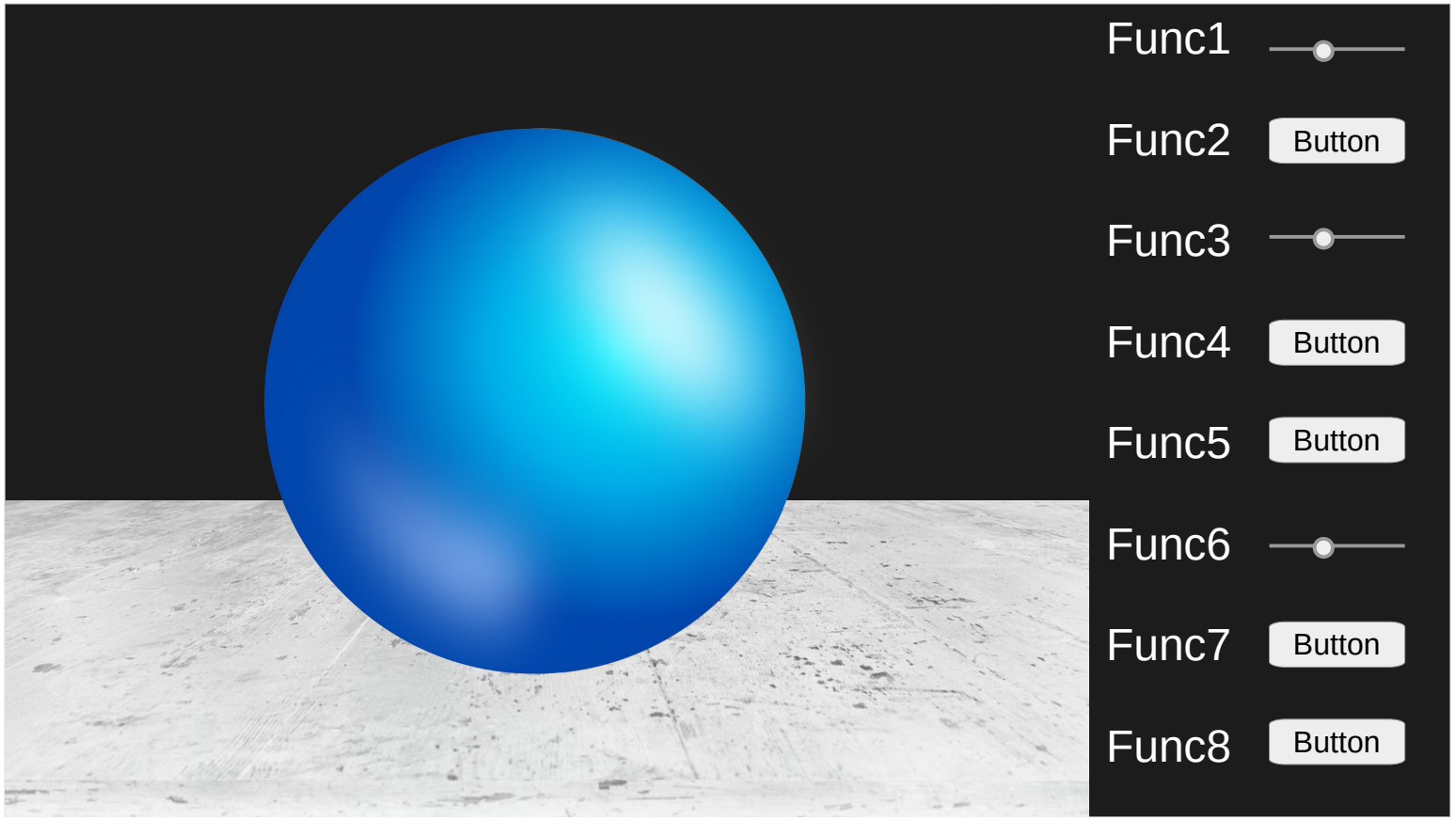
- One plane centered on a 3D model (sphere).
- A side bar presenting multiple transformations.



Graphical Transformations

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- Move the light source around the model.
- Move the camera around the model.
- Change between **projections** (parallel and perspective).
- Change between types of **shading** (flat, goraud, phong, etc).
- Control the **number of vertices** on the sphere (decimation of the model).
- Control **scaling** of the model.
- Apply **noise** to the model. Checkbox to enable/disable **Gaussian smoothing**.
- Remove the model and apply a **texture to the floor**. Change between different **texture filters**.
- Per review: Create a secondary point-of-view to observe the **frustum of the main camera**.
- Per review: Create a closed box around the model and apply **ray tracing**.

Development

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- Interactivity and visualization will be handled through PyGame.
- Computations related to graphical transformations in the pane will be developed with PyOpenGL.