

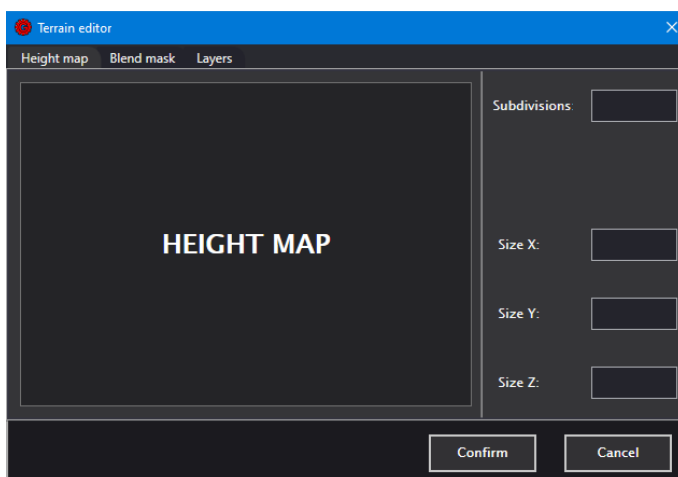
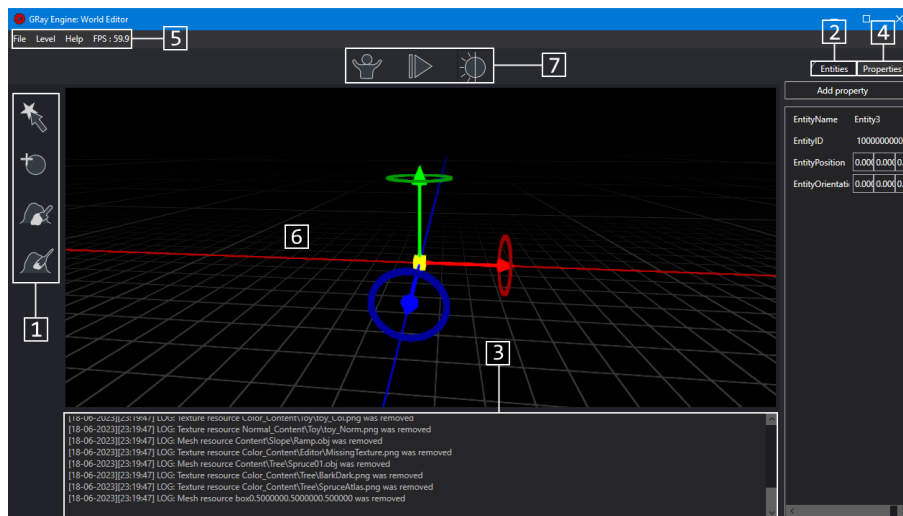
# GRay Engine by Savchenko Daniil

## Features overview

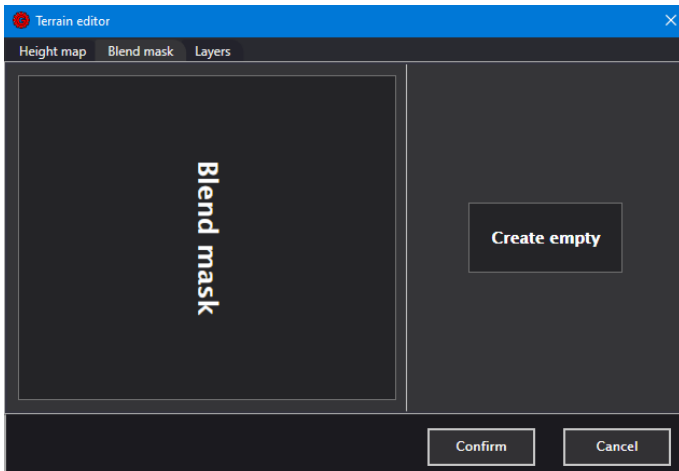
<https://github.com/HarryP0ster/GrayEngine>

GGray engine is based on Vulkan API and realizes Deferred shading technique with Fast Approximate anti-aliasing. It was built as passion project with no prior experience in graphics programming field. Gray World Editor is a custom level editor developed on top of the engine. Program uses C++ to communicate with the engine and C#/WPF as user interface.

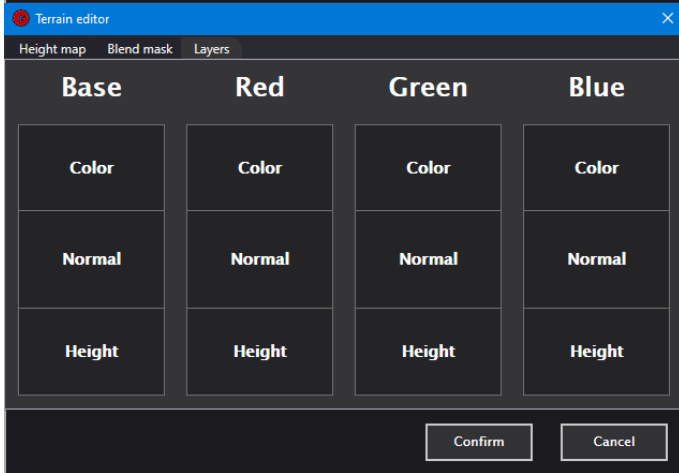
### 1. Main View of the World Editor



Terrain editor lies in the «Level» component under misc controls section.

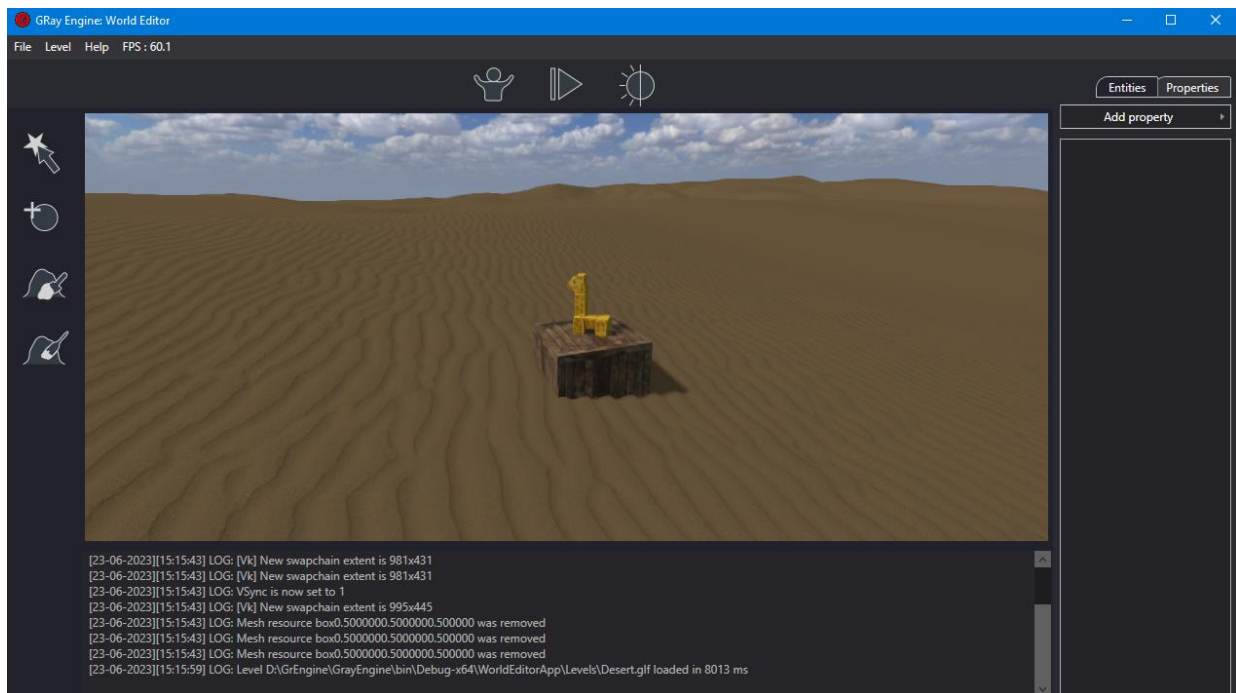


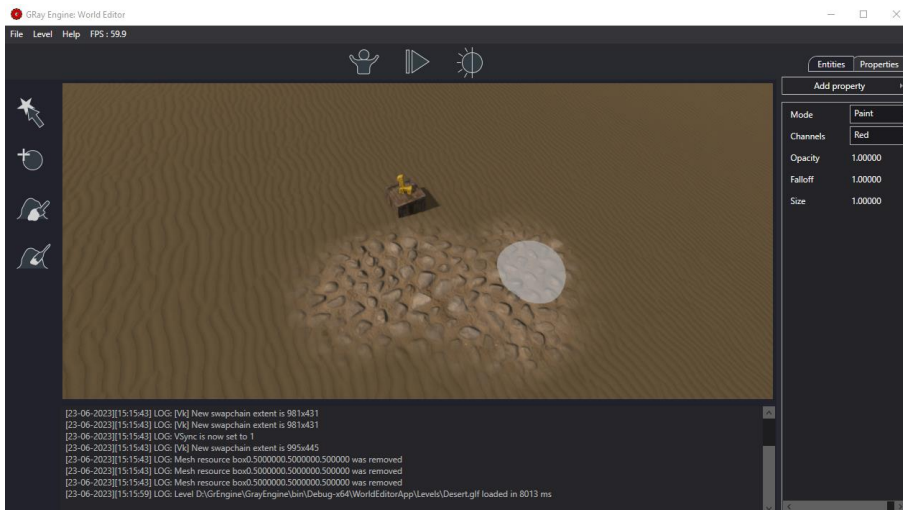
Blend mask defines the way textures are applied to the terrain.



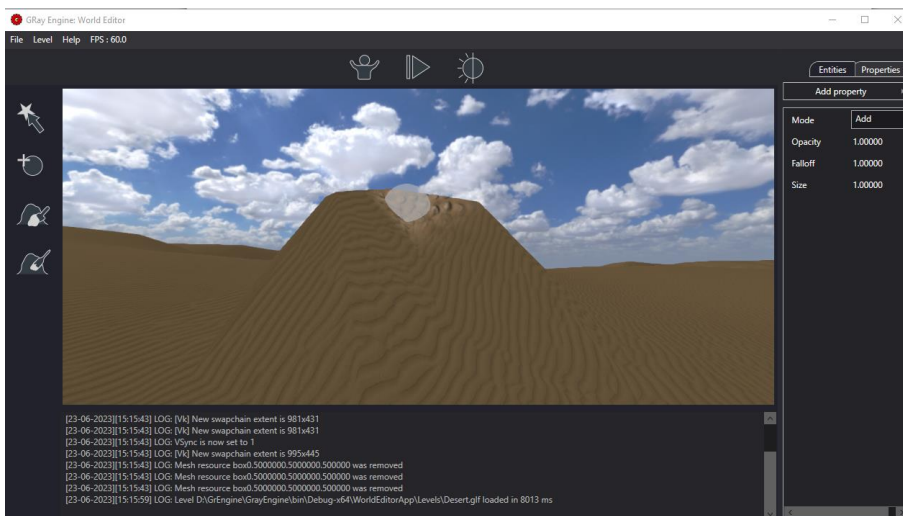
Each set of textures represents a certain color of the blend mask.

Levels can be saved and loaded using «File» section under misc controls. Shown below is the level with generated terrain, a few models, skybox and directional light:

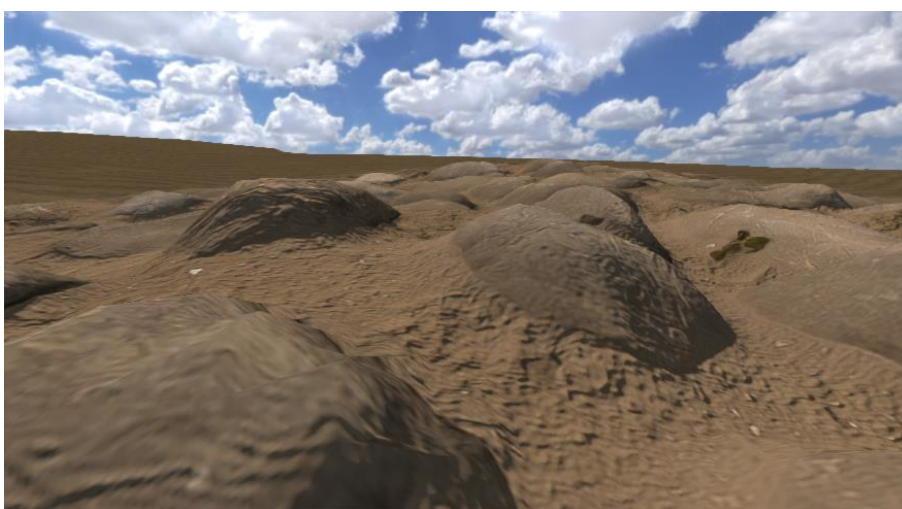




Terrain brush tool allows user to paint the color mask of the terrain.

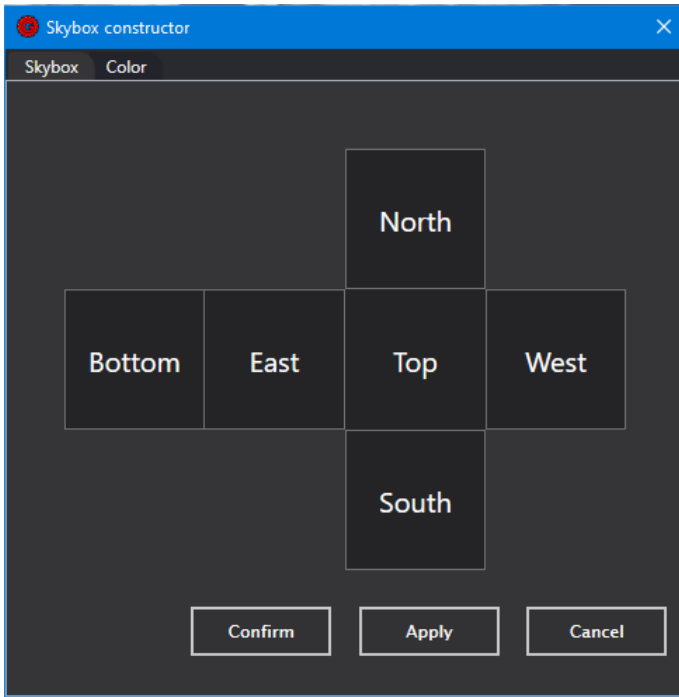


Terrain sculpt allows user to edit generated terrain.

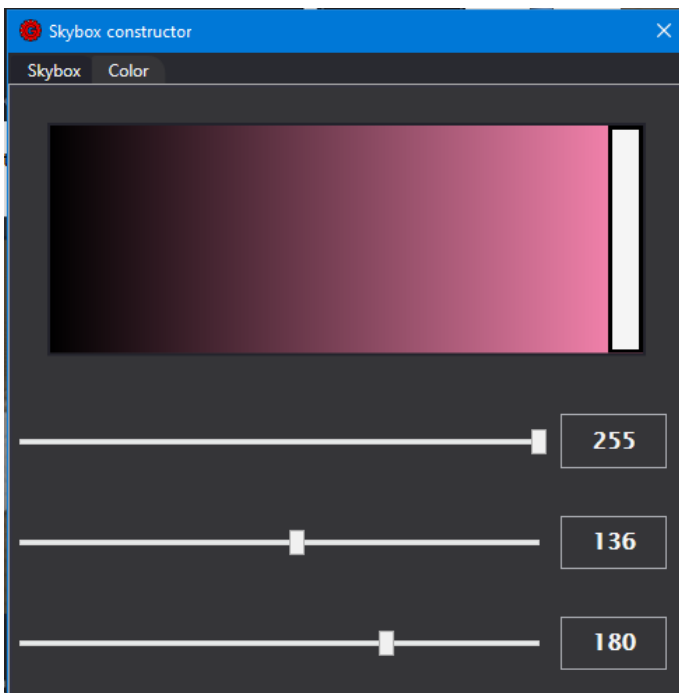


Terrain materials also support tessellation shaders coupled with height maps to massively improve its visual quality.

Image above was taken using «Save screenshot» button under the tools section. «Toggle lighting» button may turn on or off usage of shadow mapping and any other lighting calculation.

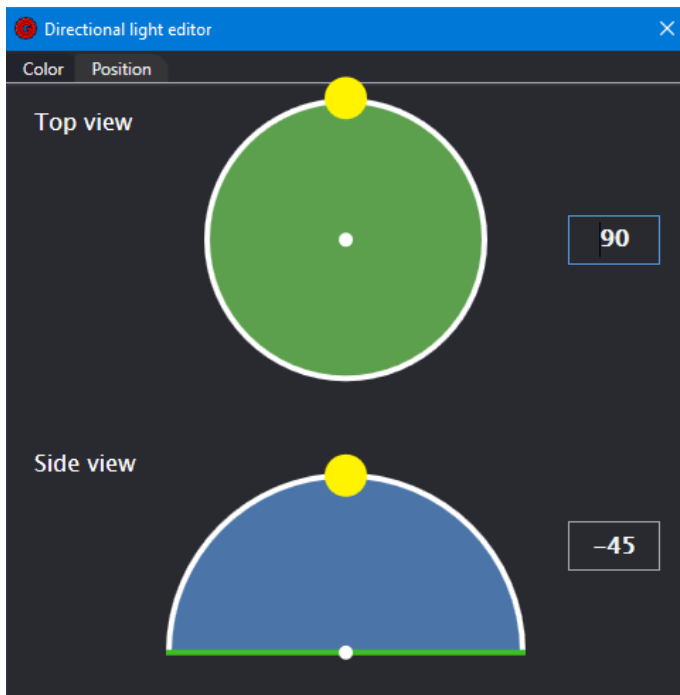


Skybox can be added using «Skybox constructor» which is present under «Level» section of misc controls.

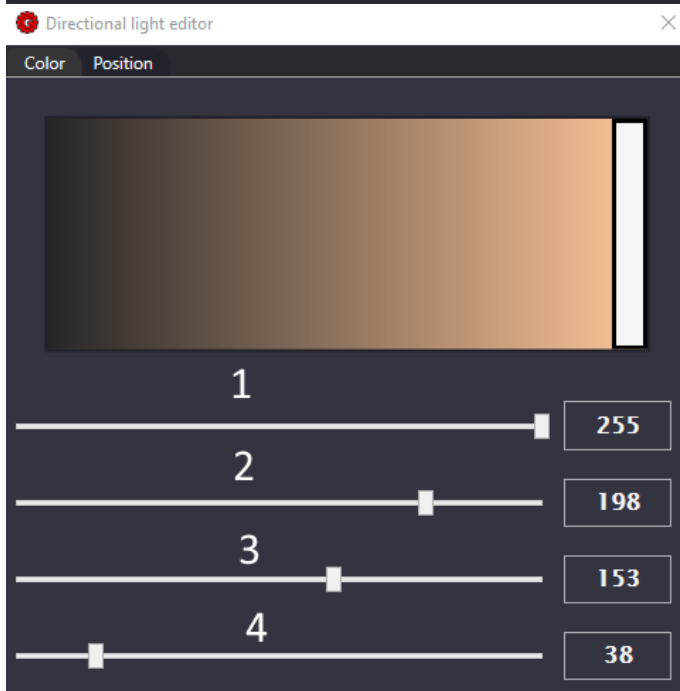


Color of the sky can also be edited.

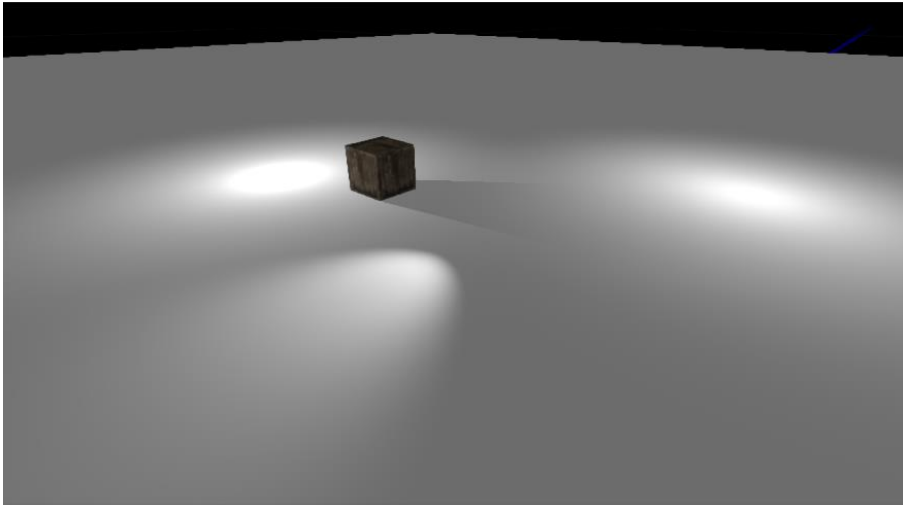
Directional lighting in the engine uses Cascade Shadow Mapping technique to improve quality of the shadows.



Direction of the light can be manipulated with «Directional light editor» which is located under «Level» section of misc controls.



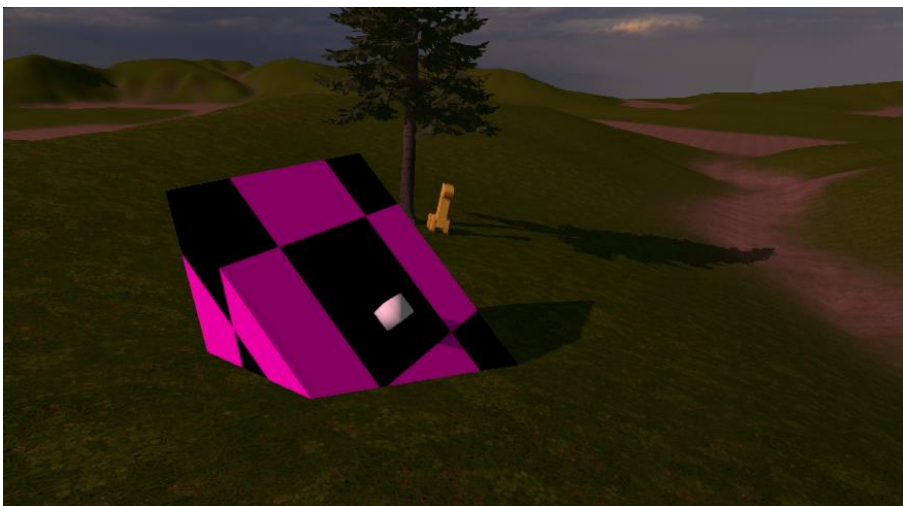
Each slider represents a color:  
1 – Red; 2 – Green; 3 – Blue; 4 – Ambient



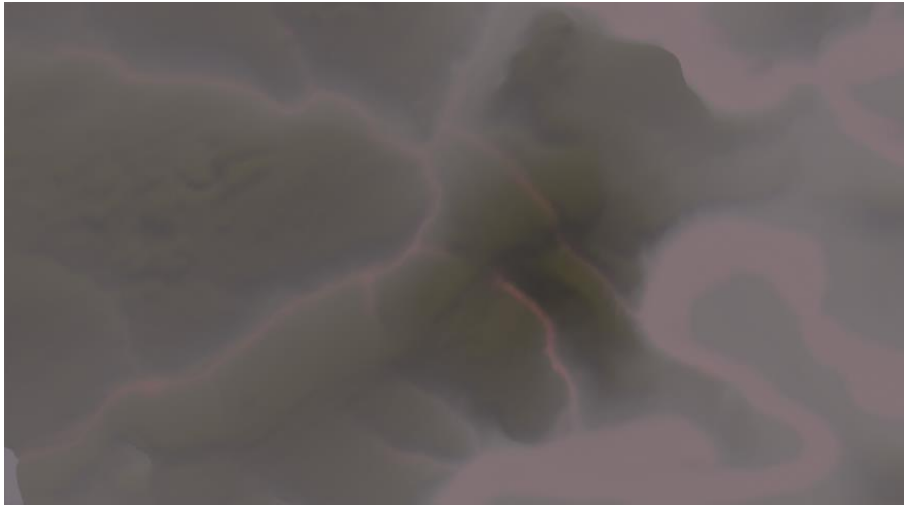
Alongside directional light, engine realizes point lights, omni lights and spot lights.



Engine supports normal mapping.



GRay engine has Bullet Physics integration to enhance the experience.



Height based fog can improve level visuals.

---

Alongside those features engine supports:

- order independent transparency;
- reposition gizmo;
- model scaling;
- basic character controller;
- distance based culling;
- different collision types and behaviors;
- sun rendering based on direction of the light source;
- model loading;
- texturing;
- custom built resource managers;
- event listener;
- logger;
- many more!

## 2. Model browser

Model browser allow user to browse and customize saved model presets. Open browser can be accessed from «Mesh» entity property. But first the property needs to be added, for that proceed to the «Entity properties control panel» in the main view and press «Add property» button. From the list of properties select «Mesh» property.

