Project report

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**Code repository**

Our code can be found at <https://github.com/lucieperrotta/ICG>

**Additional implemented features**

**Infinite terrain generation:** Instead if moving the camera over the plate, the camera stays in the middle of plate and the plate changes shape because the FbM is actually moving. This allows us to walk infinitely ahead.

**Mist and transparency**: The mountains fade out with distance and mix with the sky, which looks like there is some fog. Also, the water changes color with distance to make it look "dirtier" with distance (like if the atmosphere is charged with dust). Please note that we had to set the fog distance to very near the camera since our PCs are not powerful at all and increasing that distance make them melt.

**Texture shading:**

**Simplex noise:** We implement an alternative of the simplex noise which features a gain parameter to modify the gain of the noise picture. We also added that gain parameter to the Perlin noise.

**Ridged Fbm:** The mountains look sharper on the tops.

**Multifractal FbM:** This is an alternative to FbM, which allows us to mix many different noises (simplex and Perlin) to create the mountains.

**Water waves simulation:** In addition to the colored reflections, the water is also moving in small movements with refractions.

**Moving sky:** The skybox is slowly moving the give the impression of the sky changing over the day.

**Keys navigation:** We can continue moving in the same direction when we continue pressing the key. Bezier curves are used to create smoother FPS movements.

**Full keyboard controls:**

***Navigation (key 1)***

↑,↓, →,←: move direction

Q - E : inertia

W,A,S,D : camera rotation

***FPS (key 2)***

↑,↓, →,←: move direction

Q - E : inertia

A,D : camera rotation

***Bezier (key 3)***

Automatic

**Repartition of work**

We all worked equally on the project, while always trying to clearly determine who should work on what task, in order not to overlap with others work. This also helped us to be more efficient as one’s would work on less code and hence be more

**External code used**

A pseudo-hash generator function by **Pietro Di Nicola**. His blog: <http://gdevice.blogspot.ch/>

We inspired our simplex implementation from **Stefan Gustavson’s** work, working for Ashima Arts: <https://github.com/ashima/>

That video was really useful to create refraction on water using a dudv map : <https://www.youtube.com/watch?v=6B7IF6GOu7s&ytbChannel=ThinMatrix>