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Submarine Cables globe visualisation





Project introduction

1

Description

- Visualize data on a globe : submarine cables
- Loading of textures plus smooth transition
- Interactivity with the globe
- Filtering of cables by year of ready for service

2

Connection to the course topic

- WebGL usage with : Globe.GL, Three.js for an interactive globe
- Custom shaders usage for texture loading with uniforms
- Interactivity management
- 3D data visualisation

2



Technical Methodology

1

Approach

- Globe.gl library to obtain the 3D globe
- Old dataset retrieve from a public GitHub repository
- Libraries : Globe.GL, Three.js

2

Alternatives

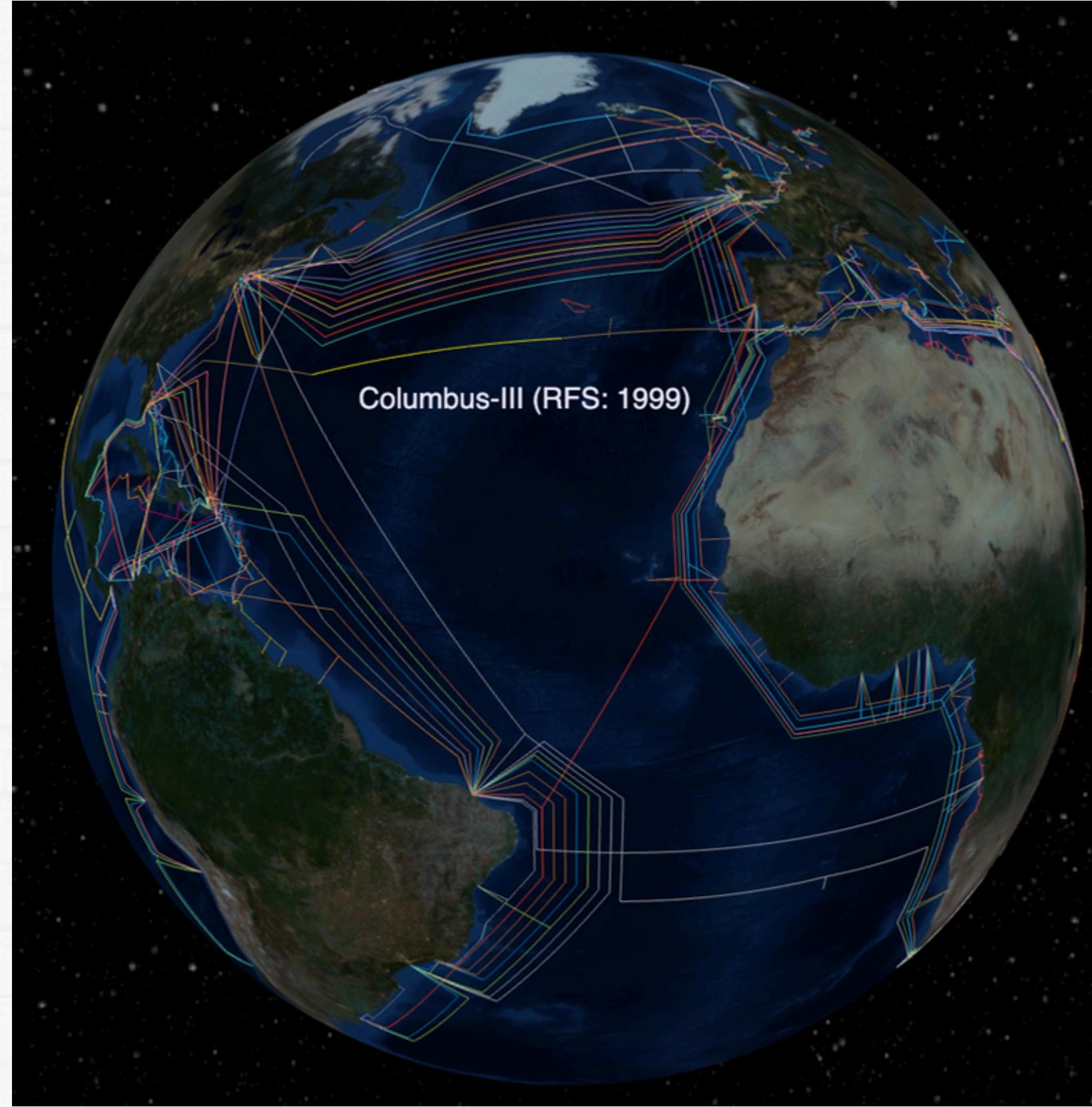
- WebGL Globe from Google : allow less flexibility and customisation or personnalisation, no complete documentation, not really maintain
- Usage of an old dataset due to a lack of accessibility to an up to date one
- Filtering cables by regions : lack of information in the current dataset

3



Implementation details

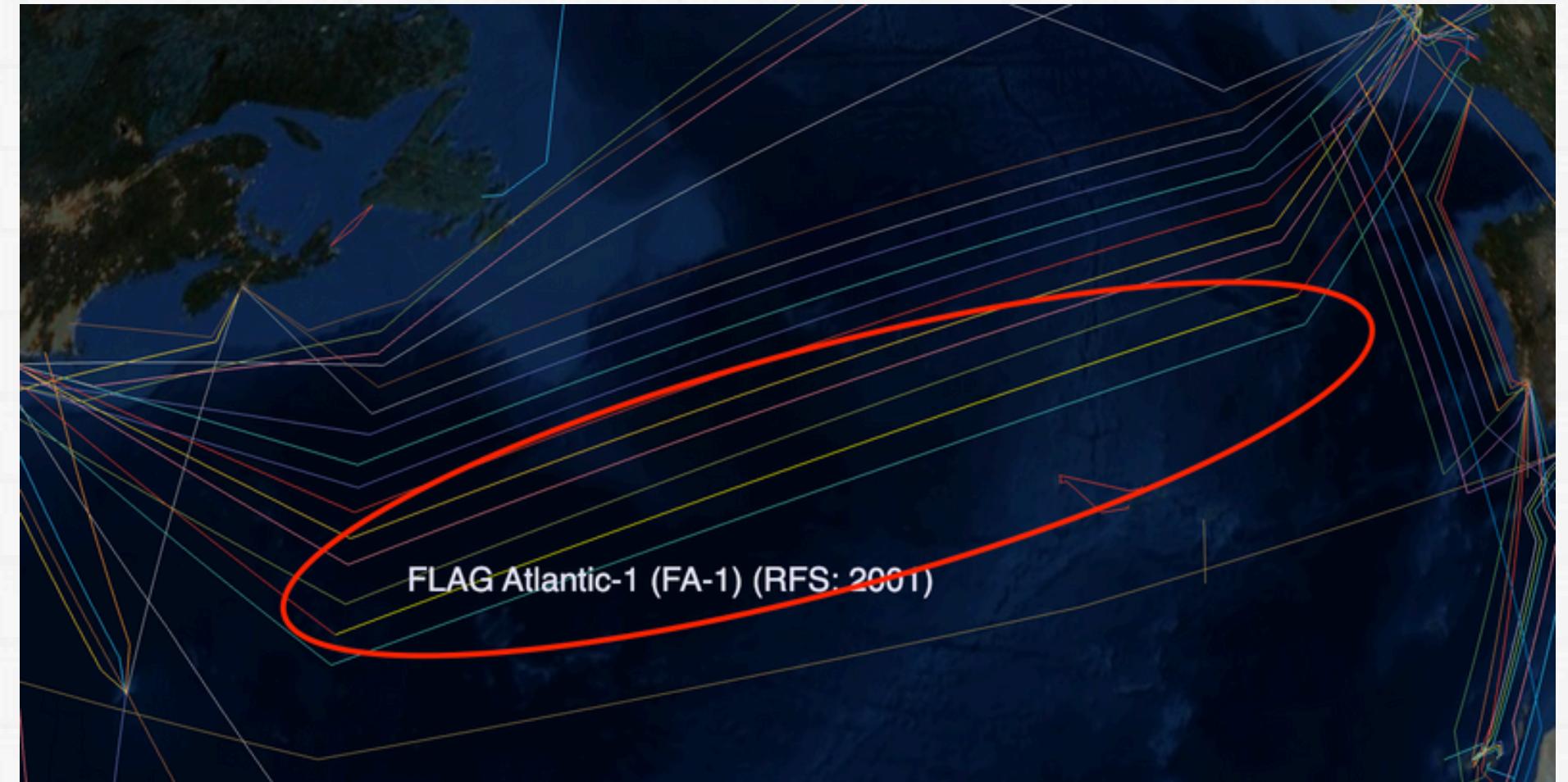
→ Data visualisation on a Globe





Implementation details

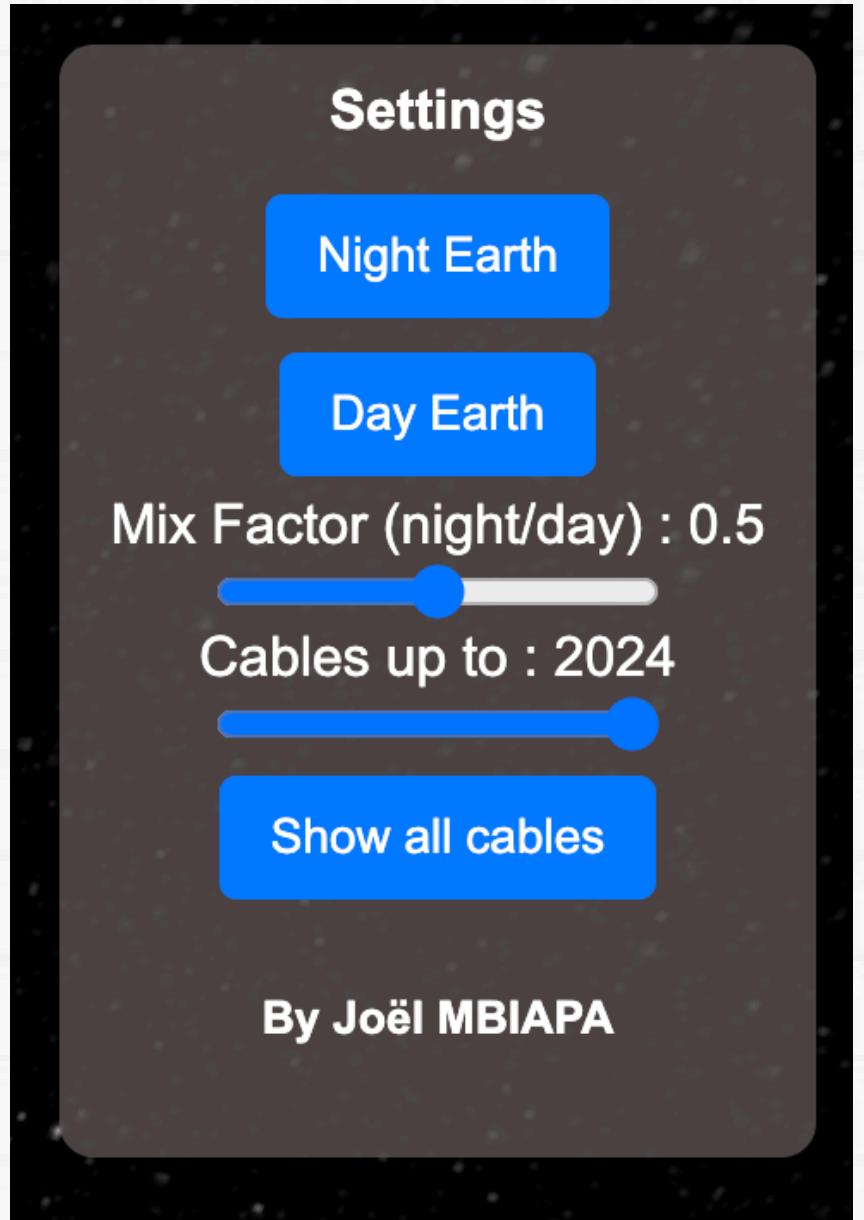
→ Hover interactivity





Implementation details

→ **Settings menu with additional interactive options**

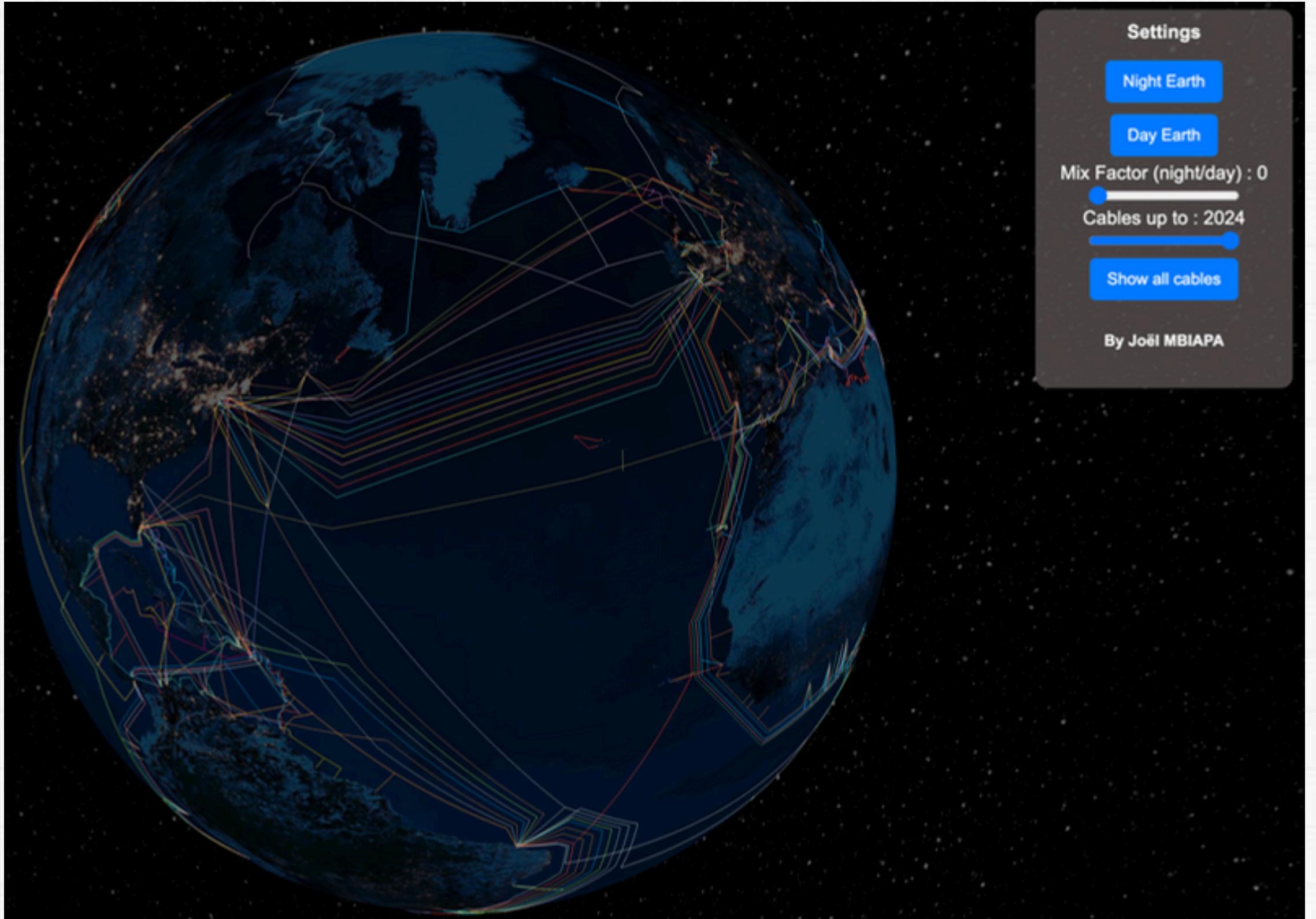
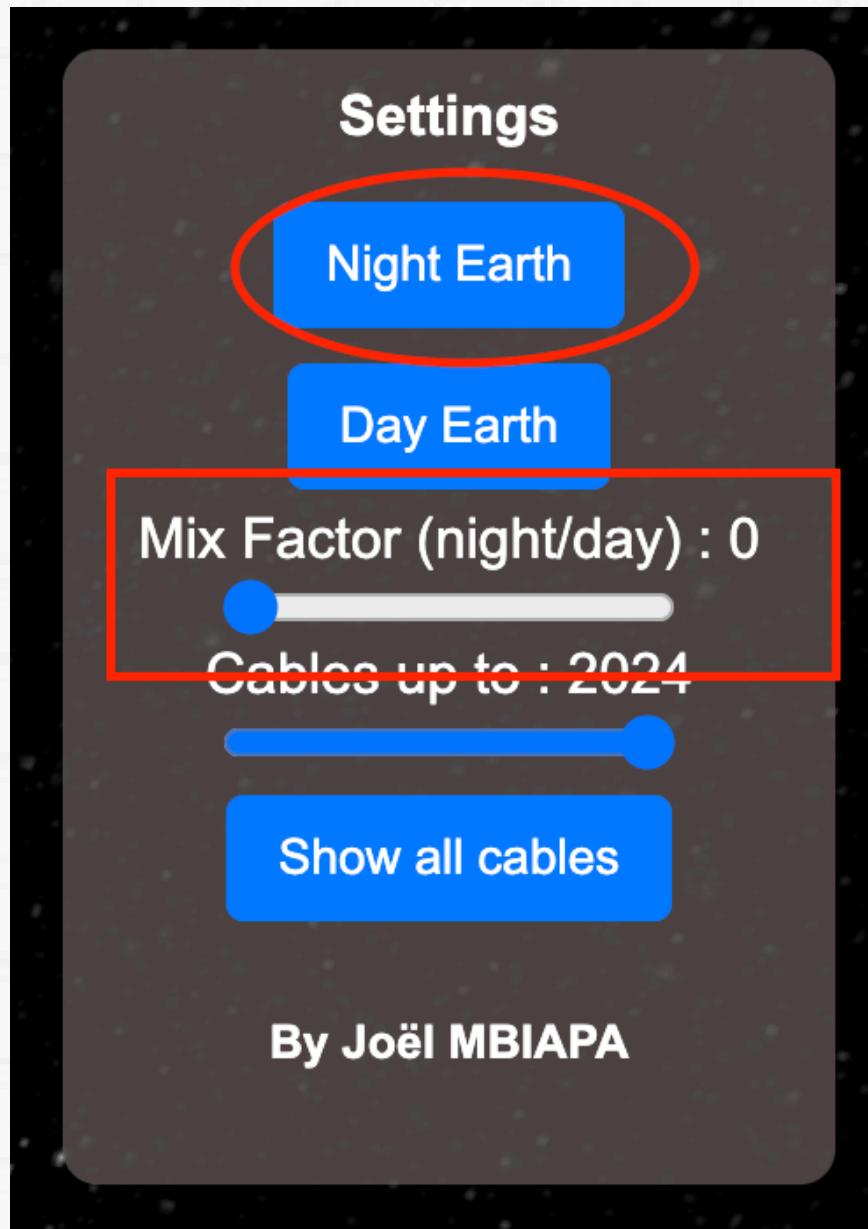




Implementation details



Settings menu with additional interactive options : texture

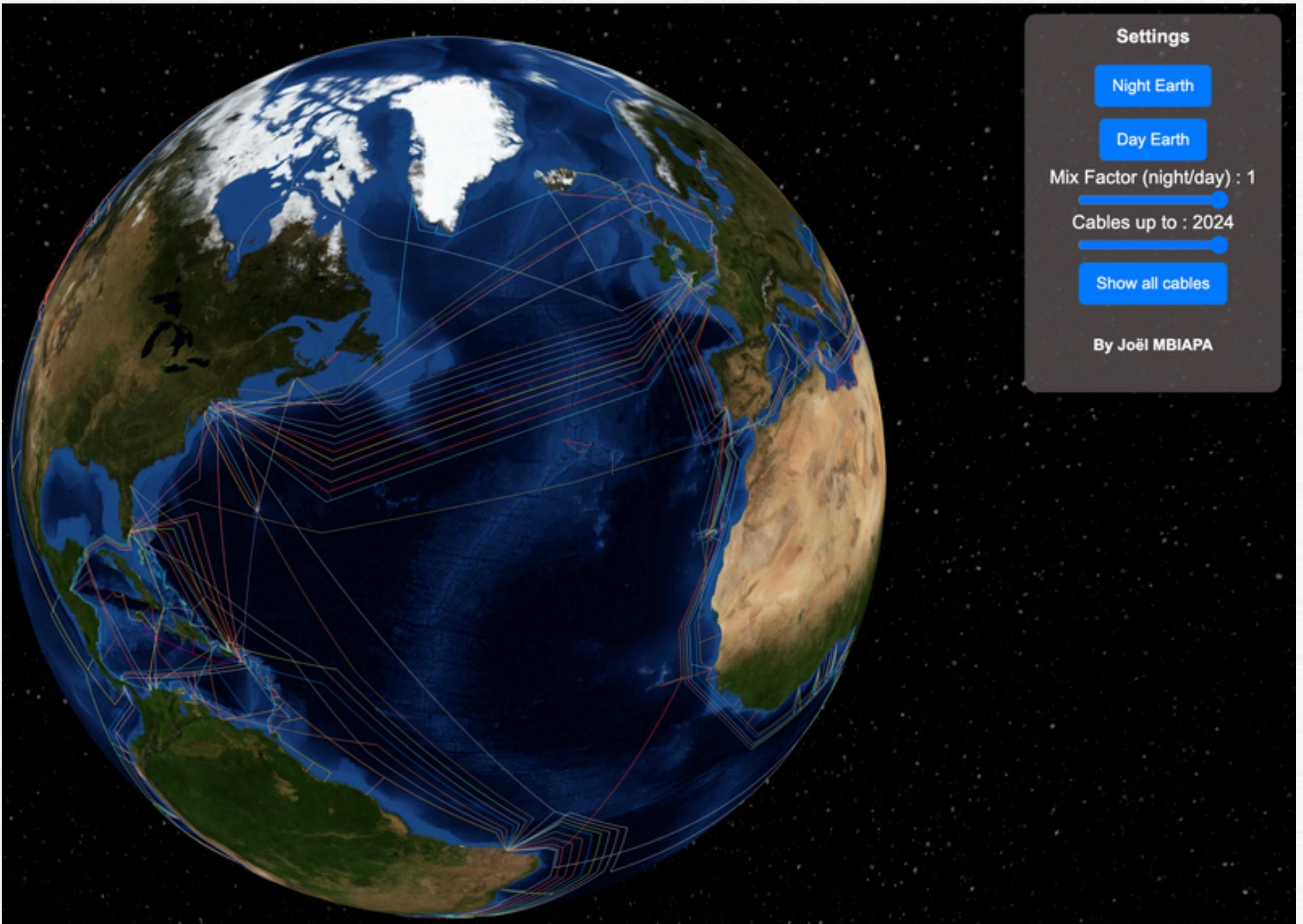
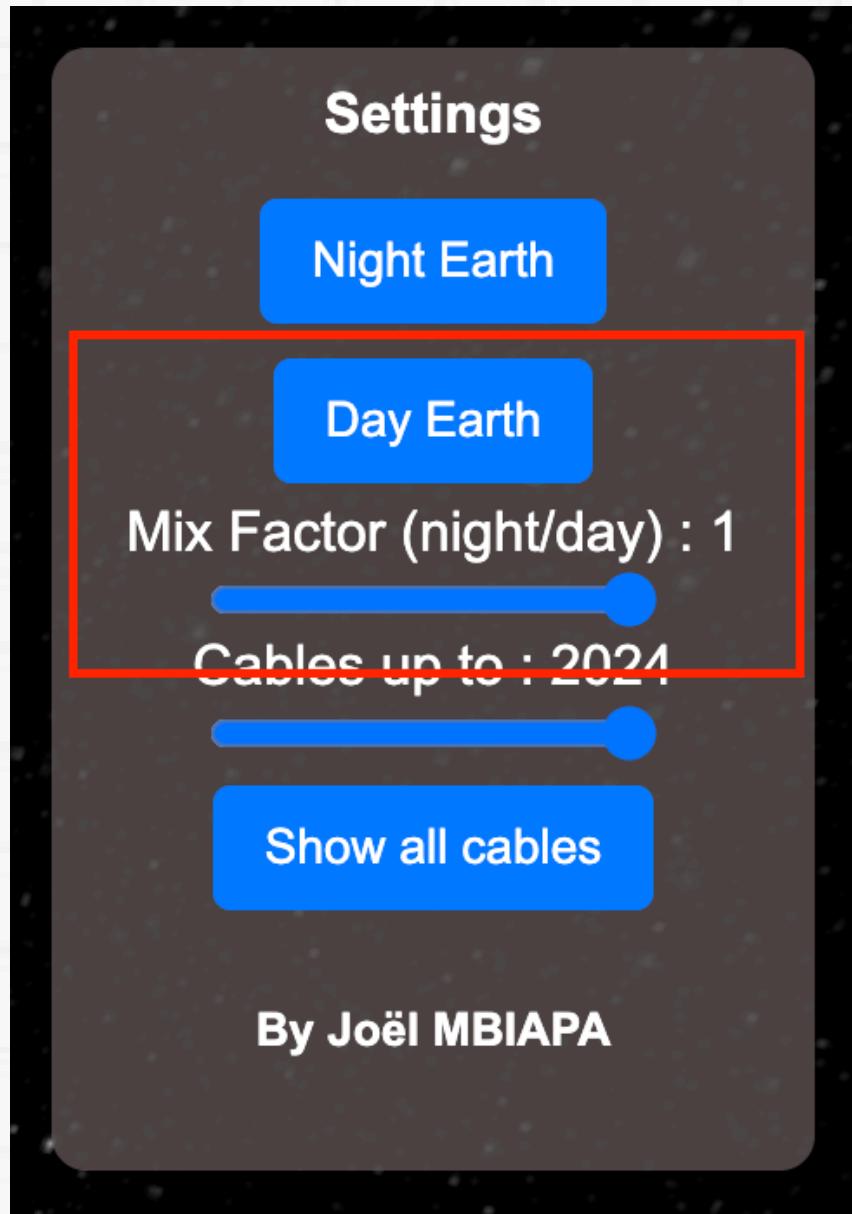


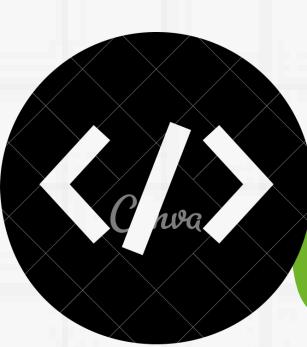


Implementation details



Settings menu with additional interactive options : texture



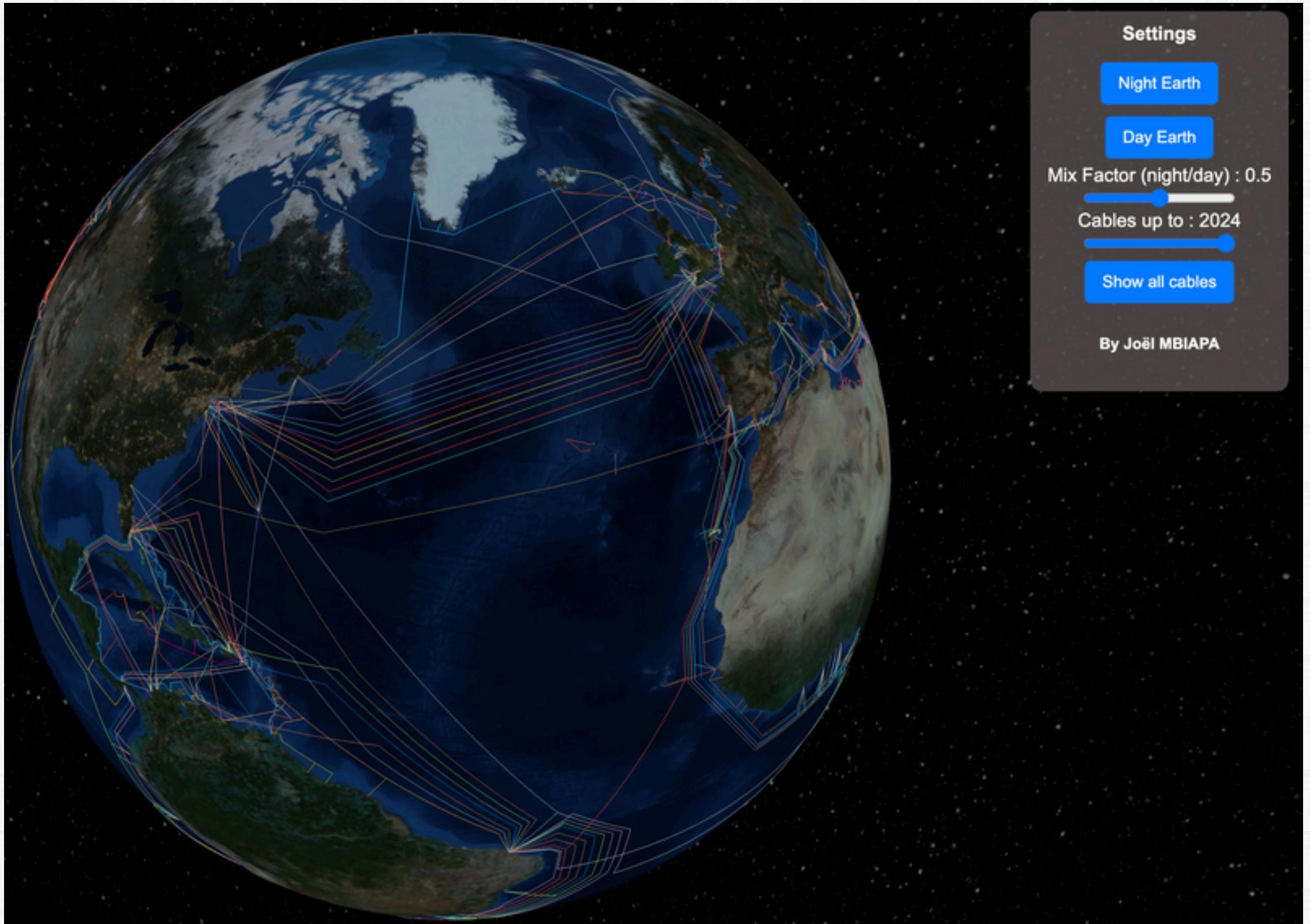
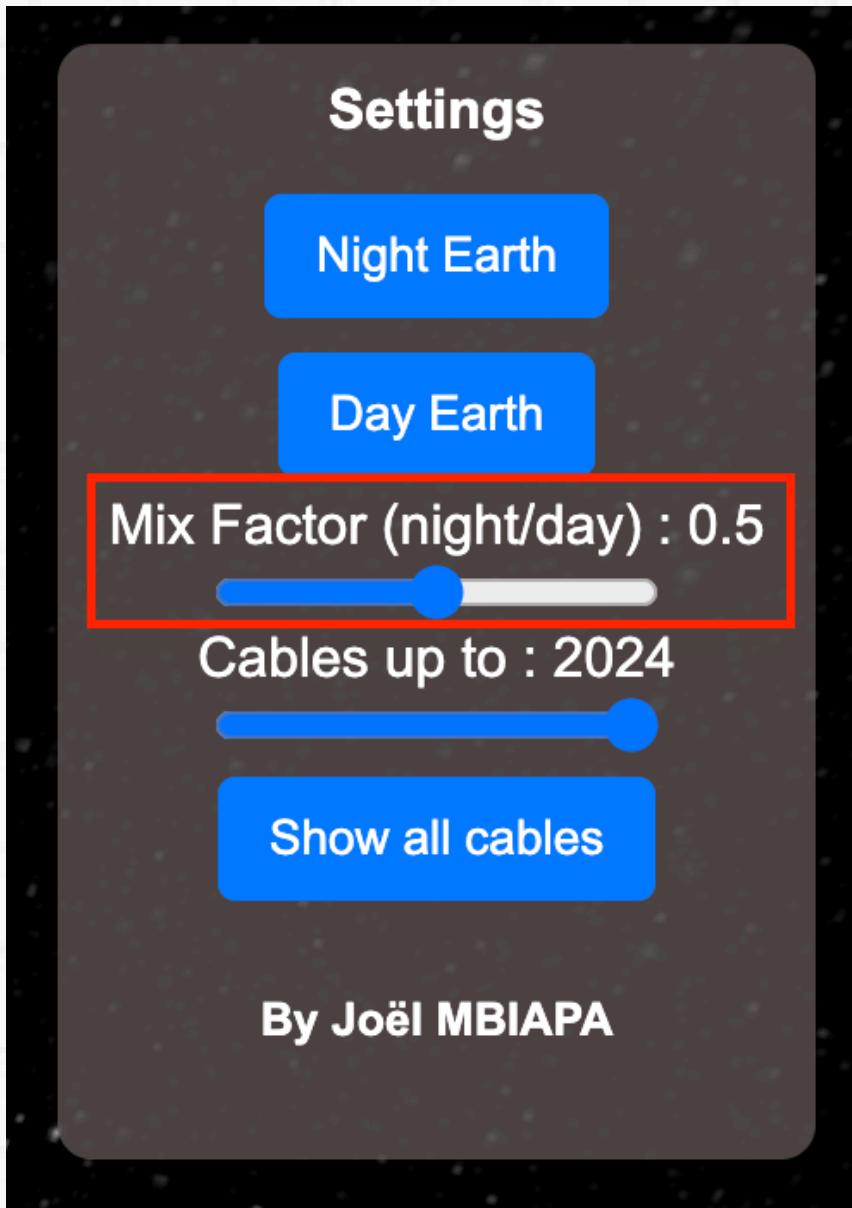


Implementation details

1



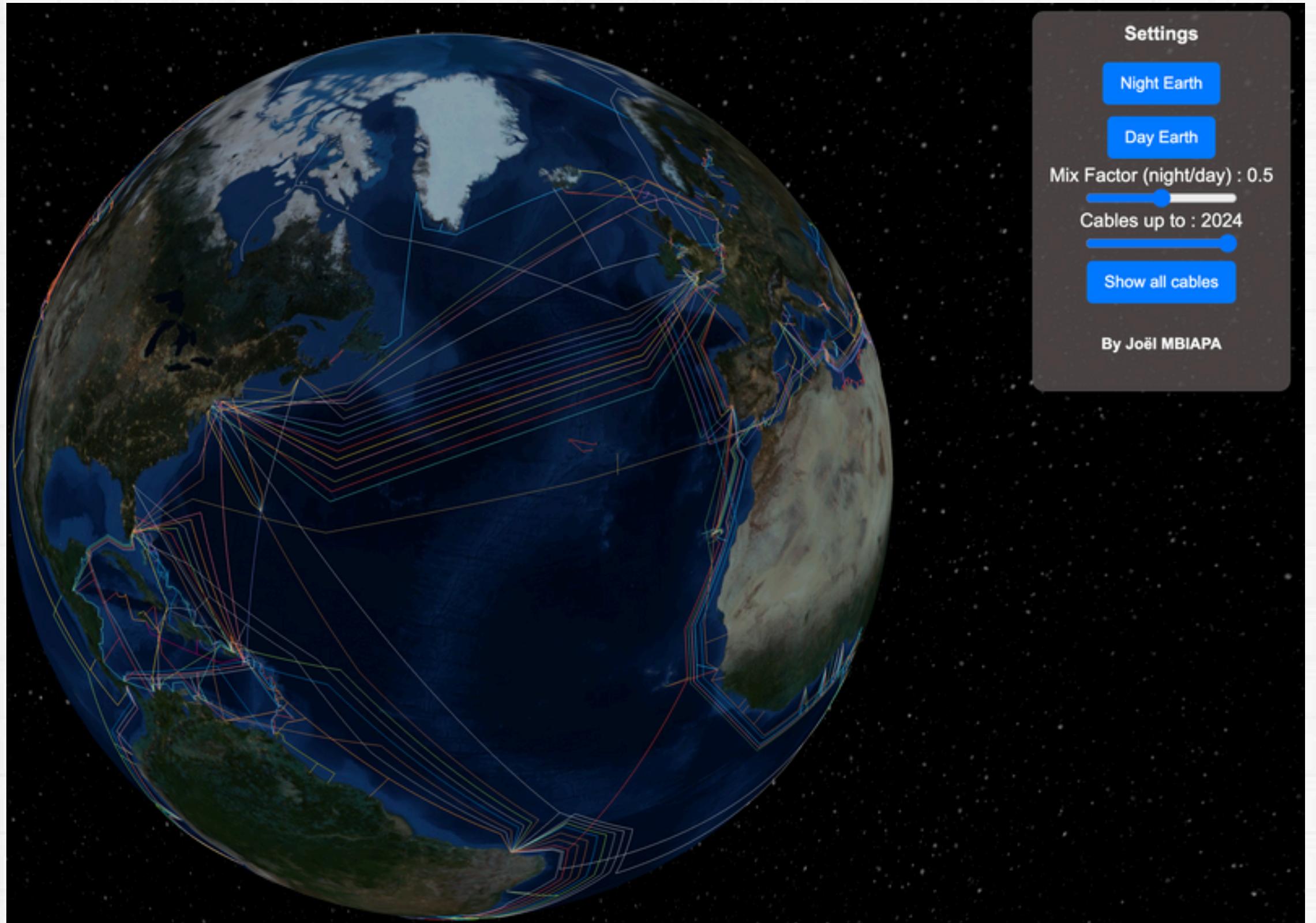
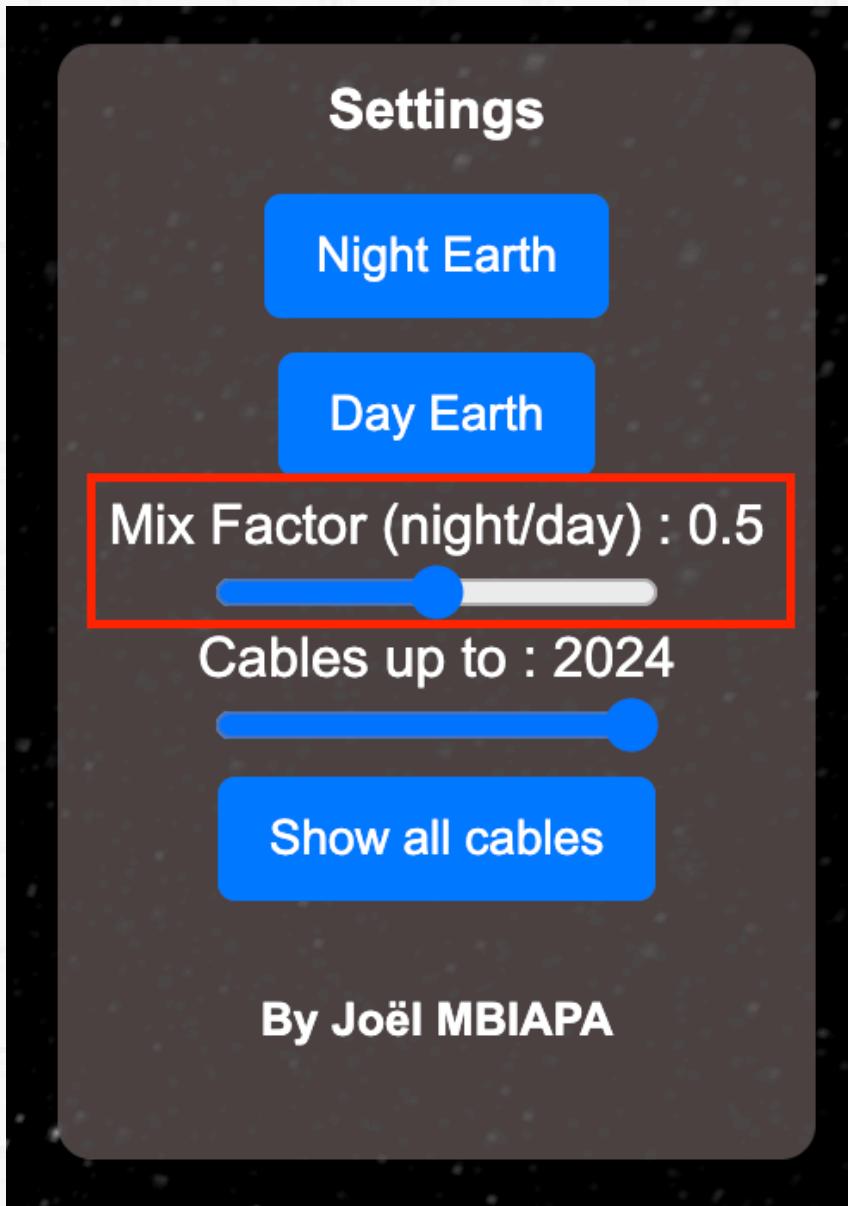
Settings menu with additional interactive options : texture

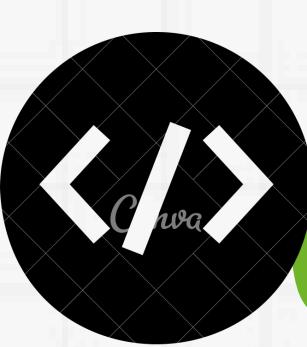




Implementation details

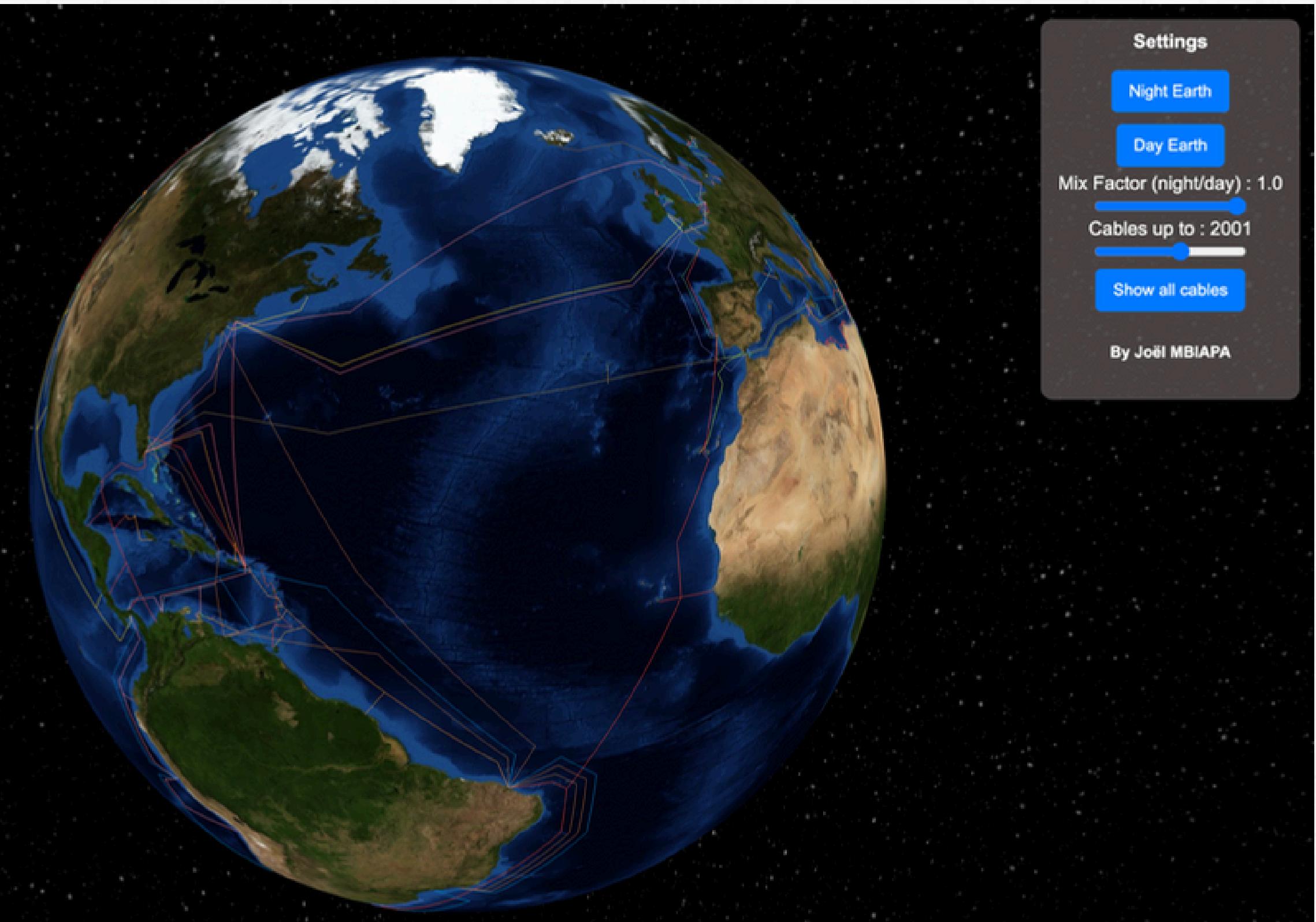
→ Settings menu with additional interactive options : texture





Implementation details

→ Settings menu with additional interactive options : filtering

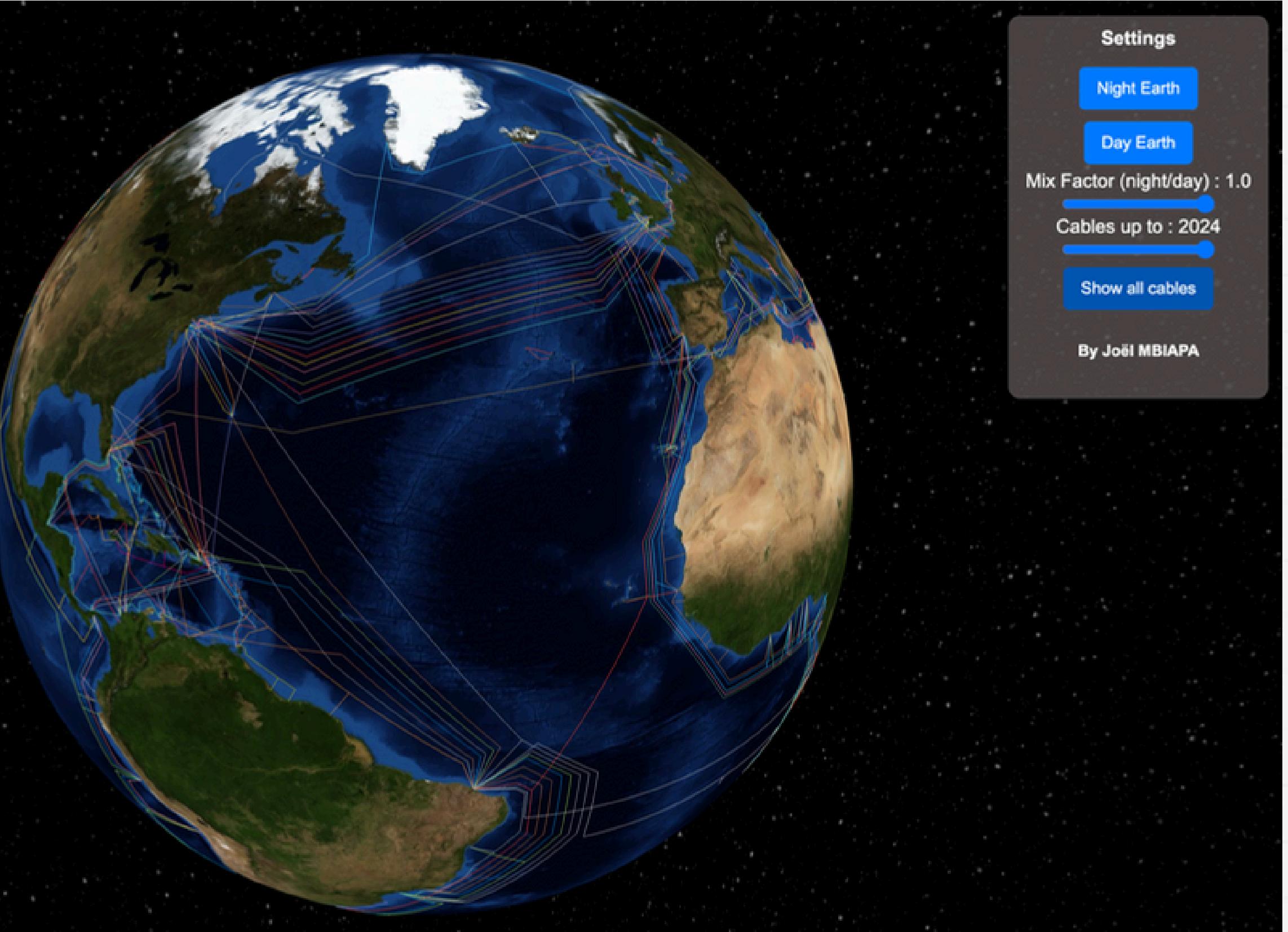
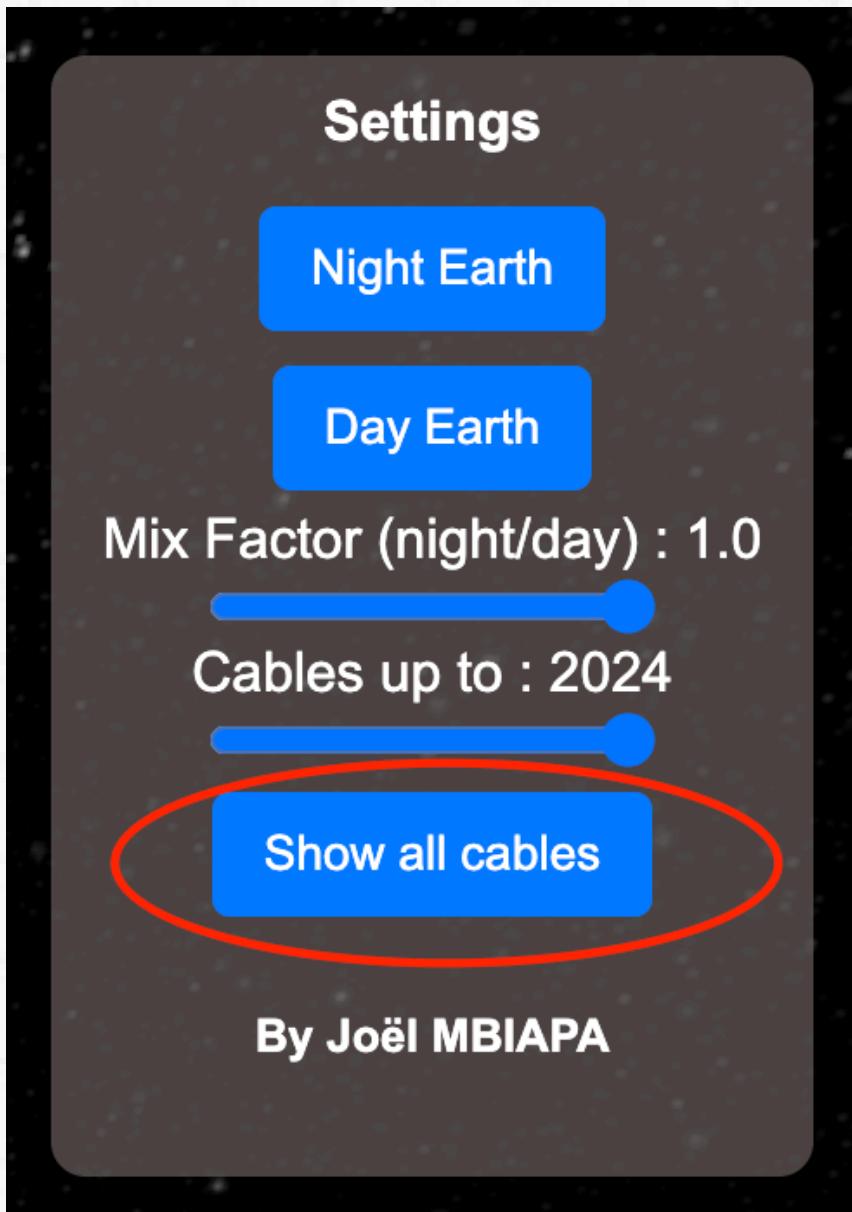


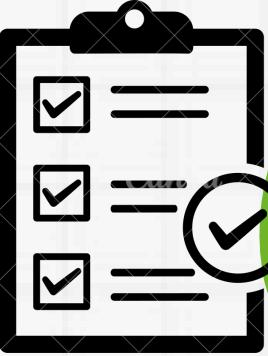


Implementation details



Settings menu with additional interactive options : filtering





Preliminary outcomes

1

Current results

- Interactive globe with texture management
- Visualisation of data
- Basic filtering

2

Challenges

- Lack of up to date **complete** dataset
- Performance and interactivity problem : need a better usage of hover functionality because the camera create micro lags beside a smooth auto rotation

Live demo



Reflections

- **Real-world application** : geospatial visualisation for company ?
- **Connection to subsequent course** : Algorithm and Data Structure for performance in real-time
- **Learning** : project management and how to react in front of issues, shaders manipulation, code optimisation for performances

Thank You !

