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Submarine Cables globe visualisation

Context

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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

Technical Methodology

1 Approach

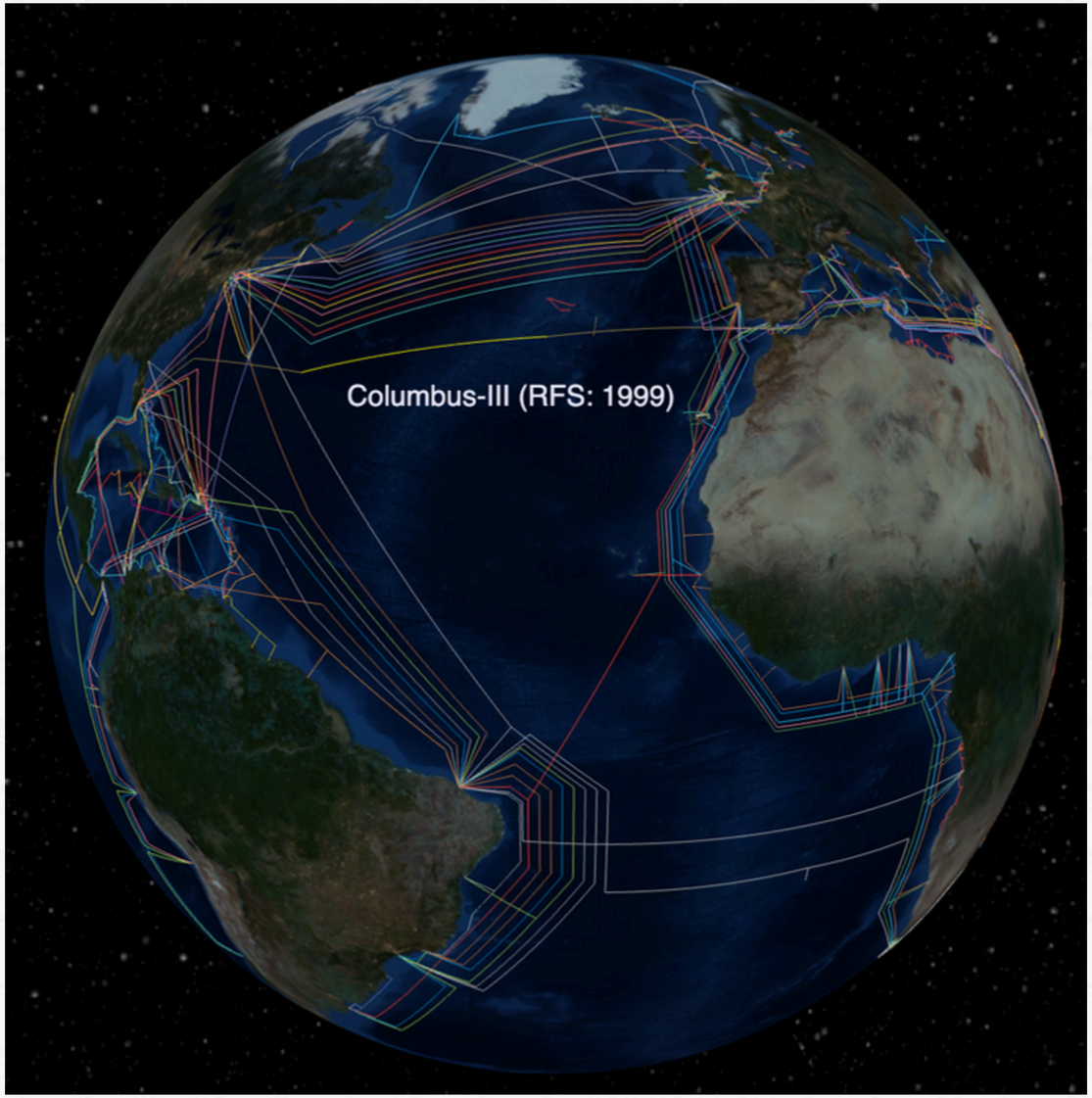
- Globe.gl library to obtain the 3D globe
- Old dataset retrieve from a public GitHub repository
- Librairies : Globe.GL, Three.js, Node.js/npm

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

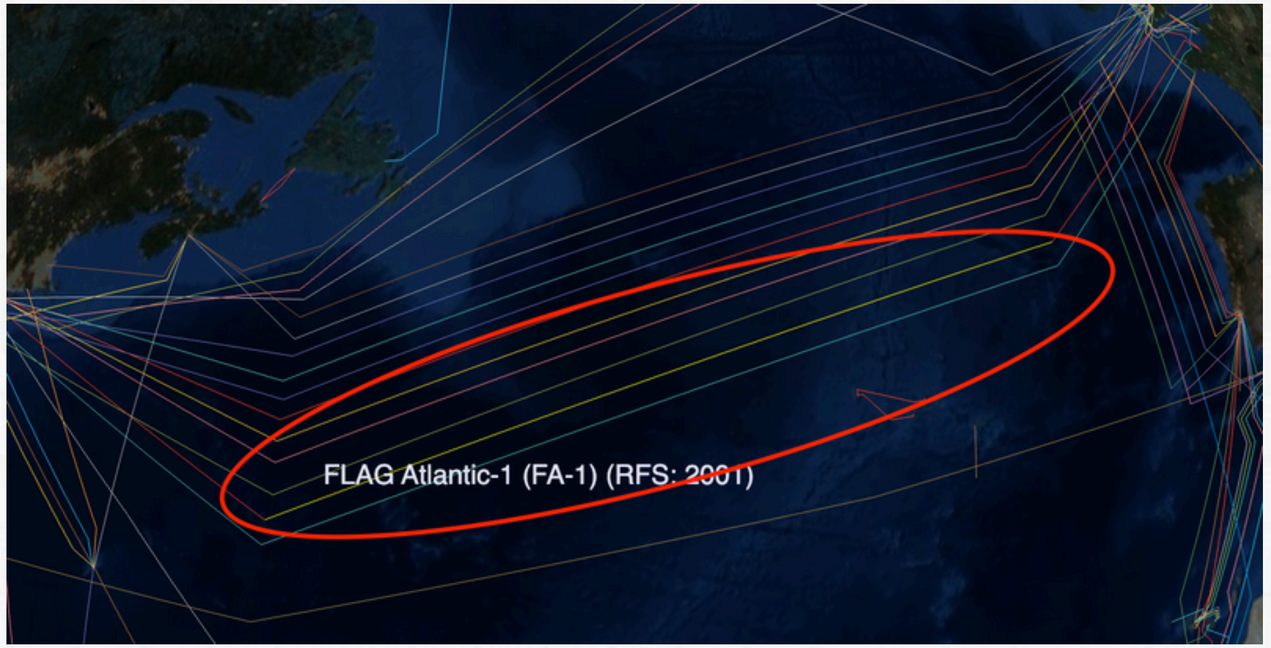
Implementation details

- Data visualisation on a Globe



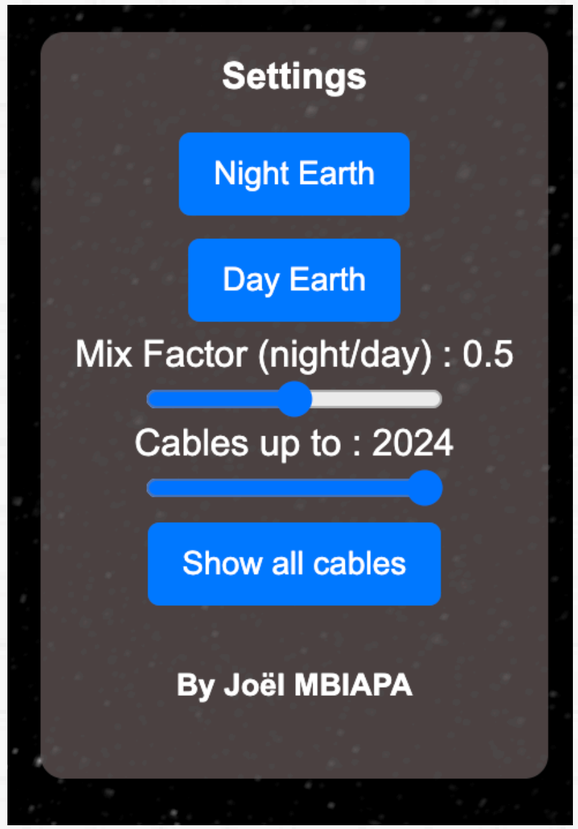
Implementation details

- Hover interactivity



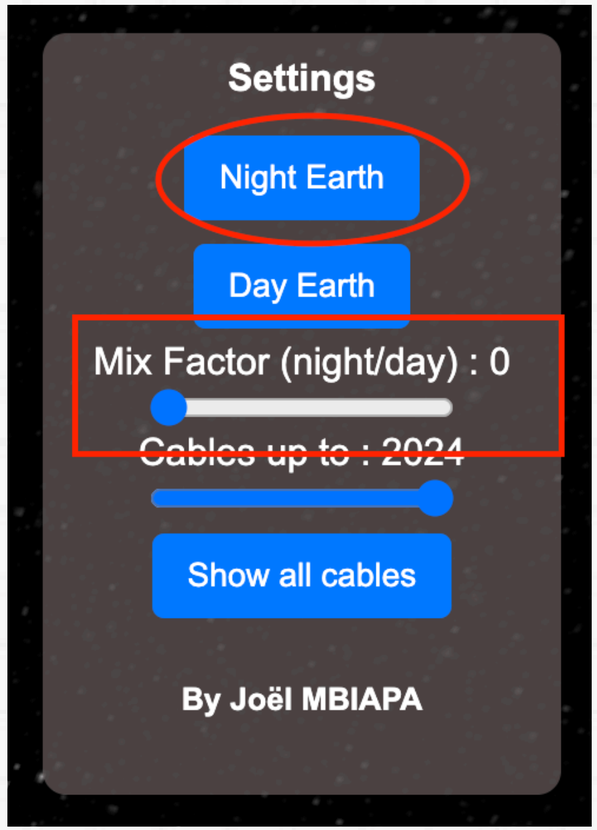
Implementation details

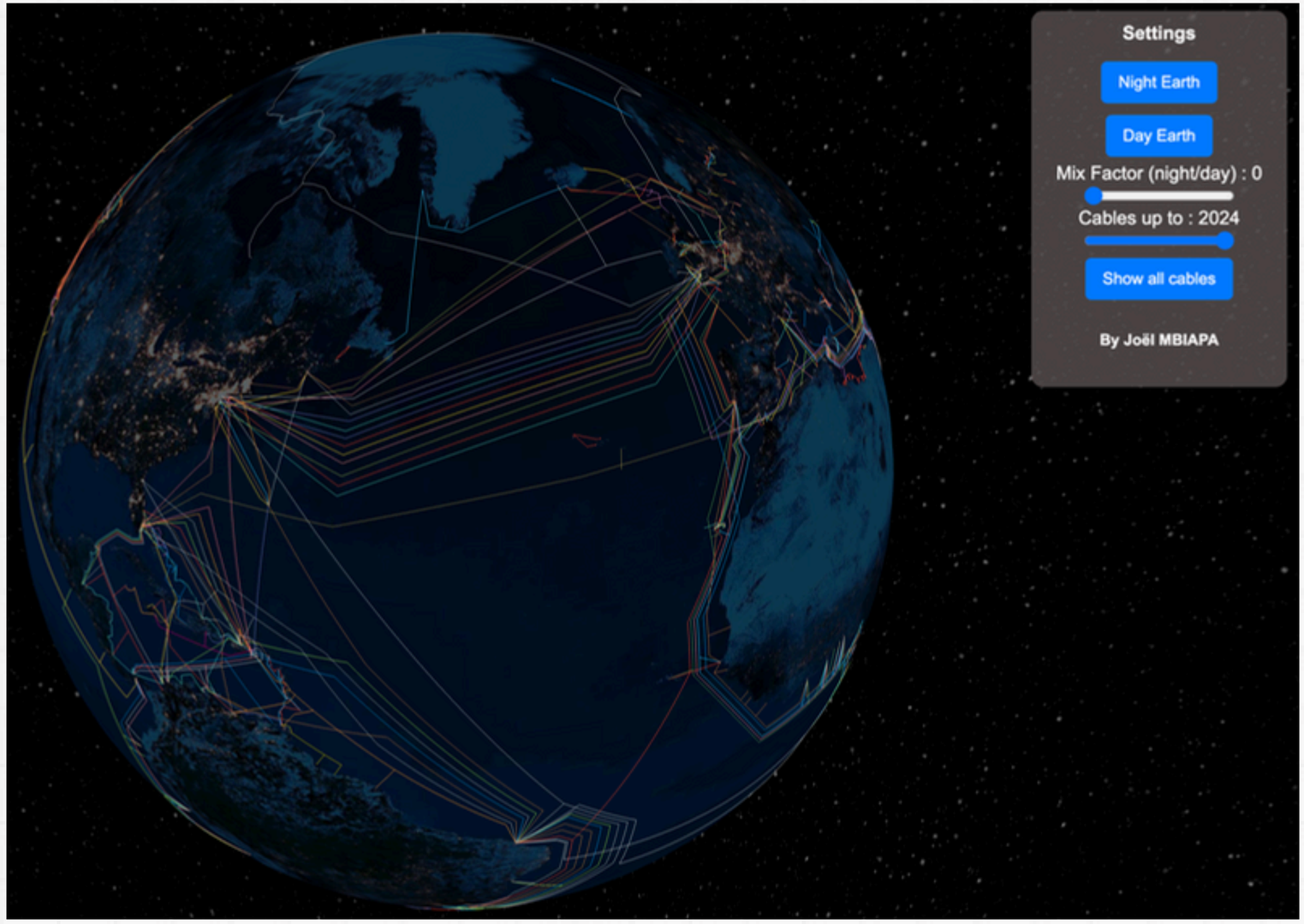
- Settings menu with additional interactive options



Implementation details

- Settings menu with additional interactive options : texture





Implementation details

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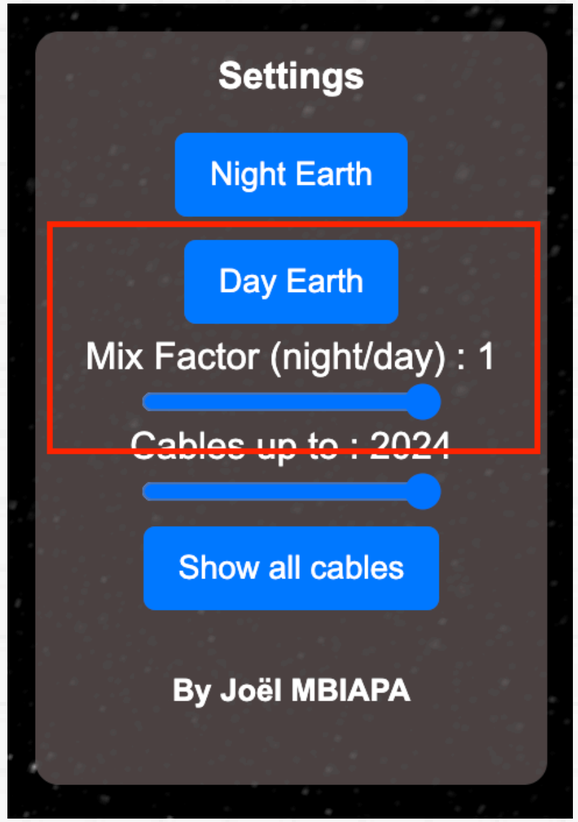

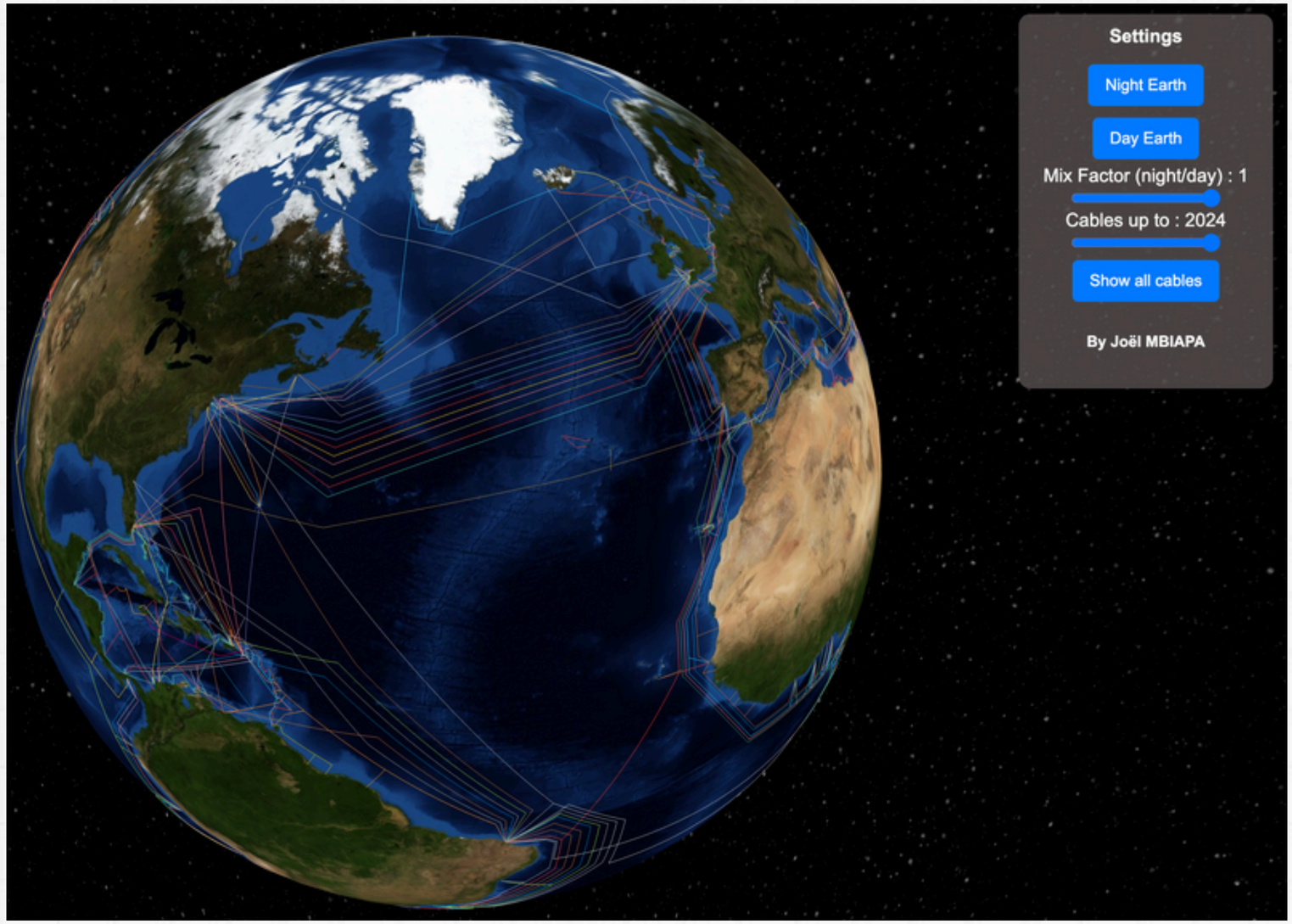

Implementation details

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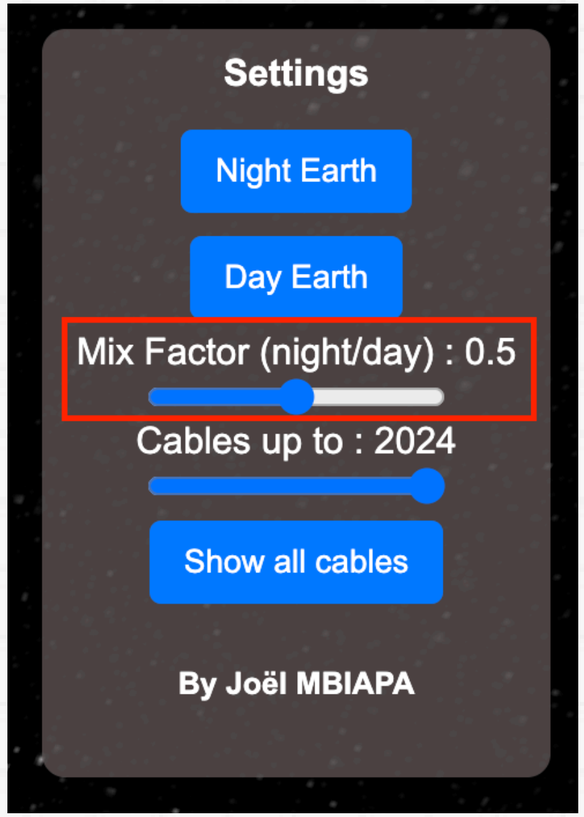
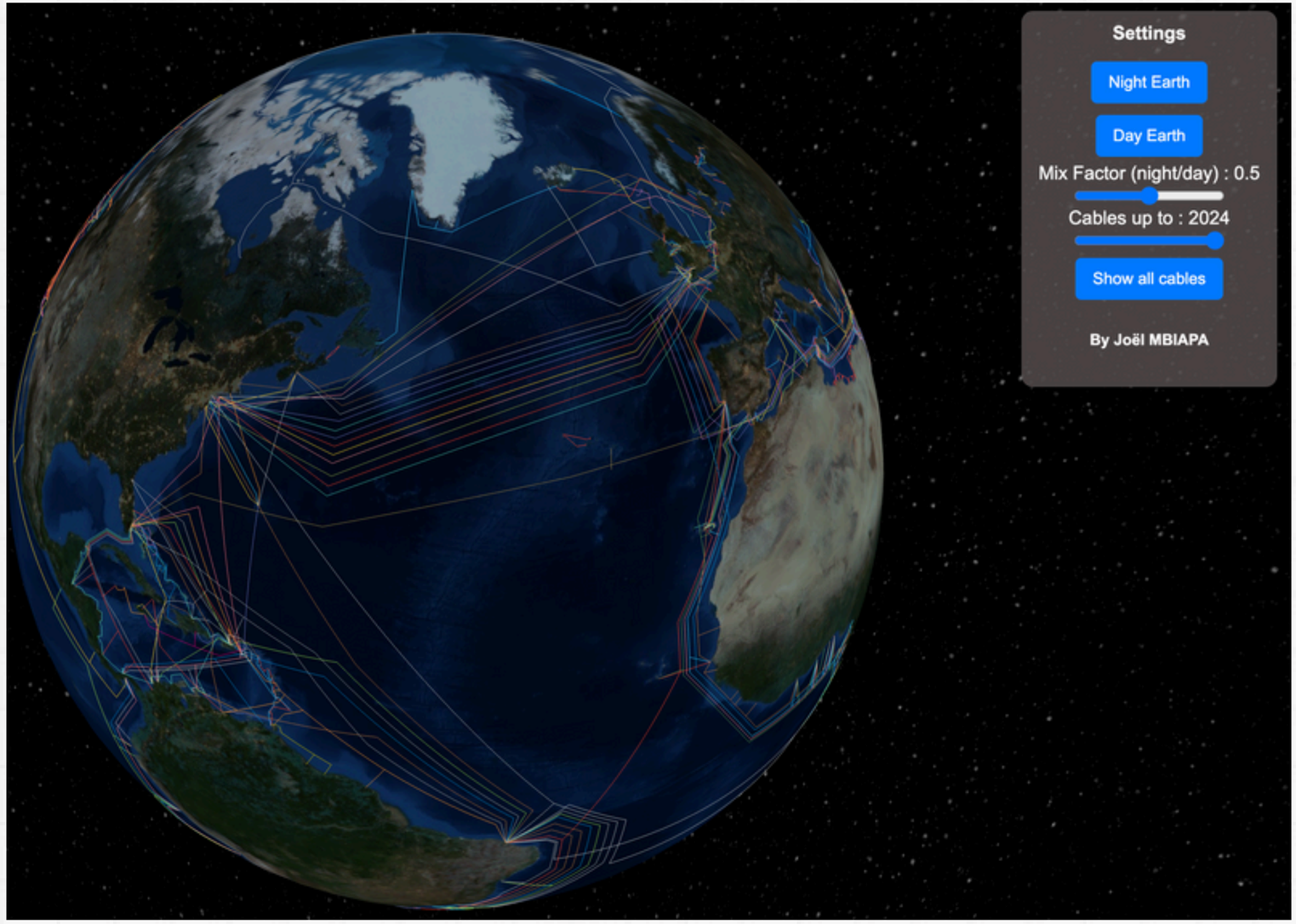
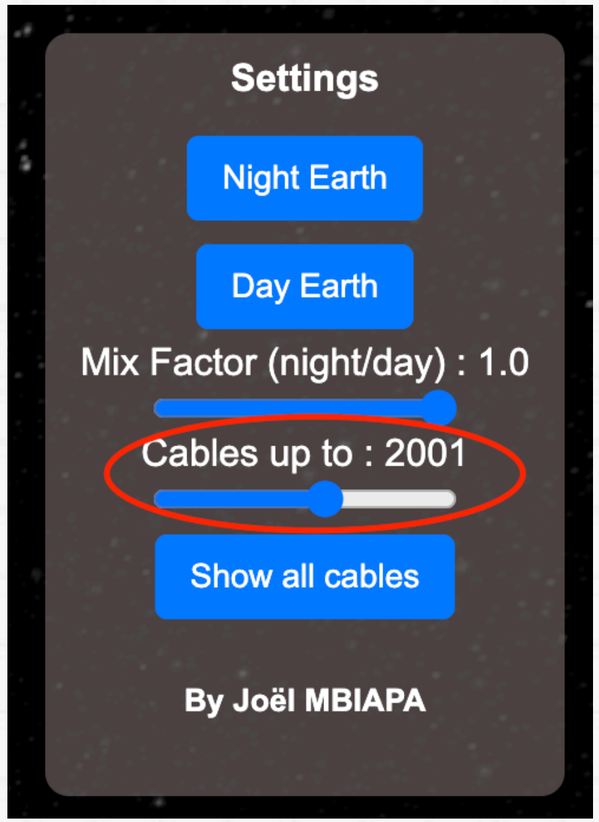
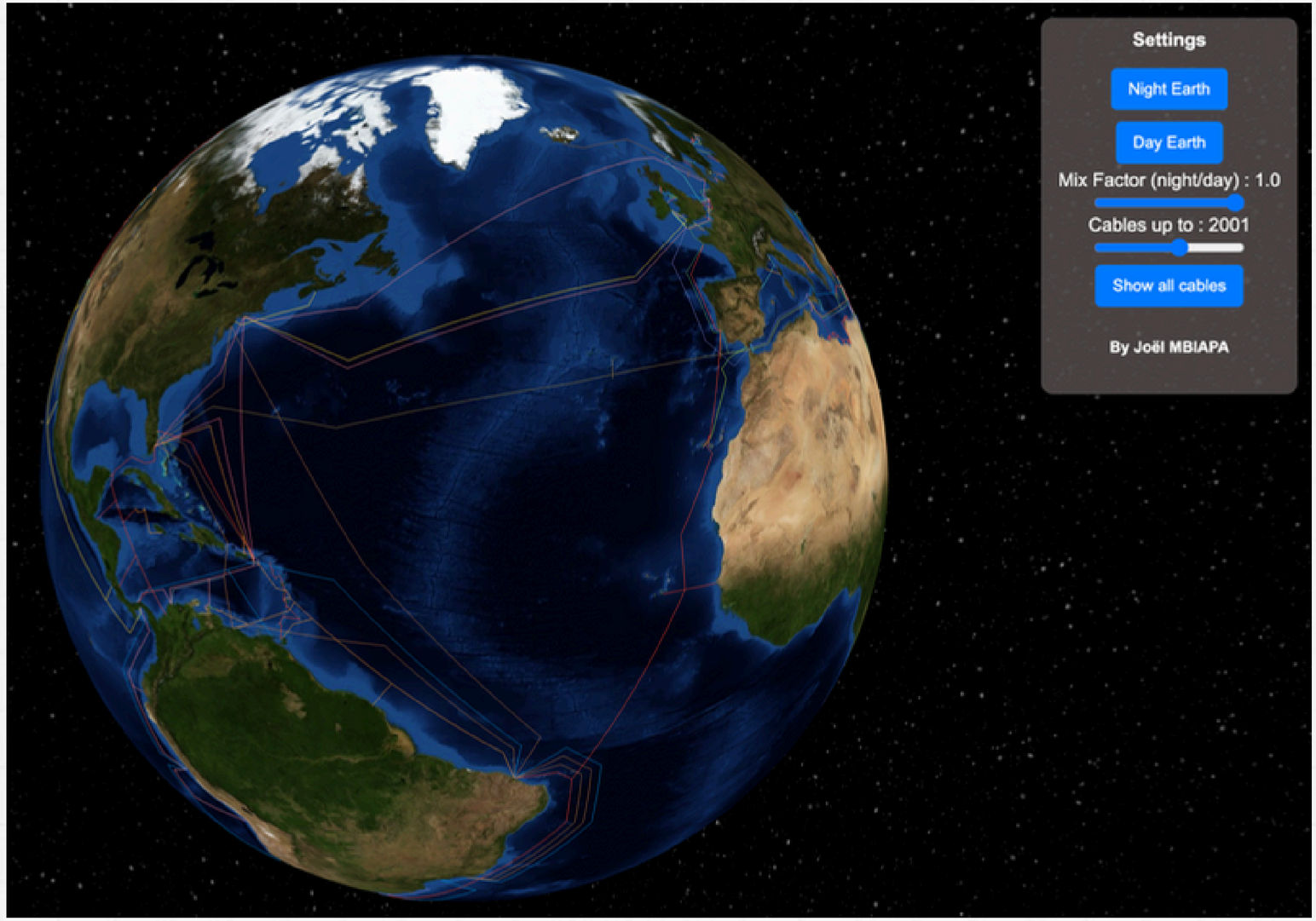




Implementation details

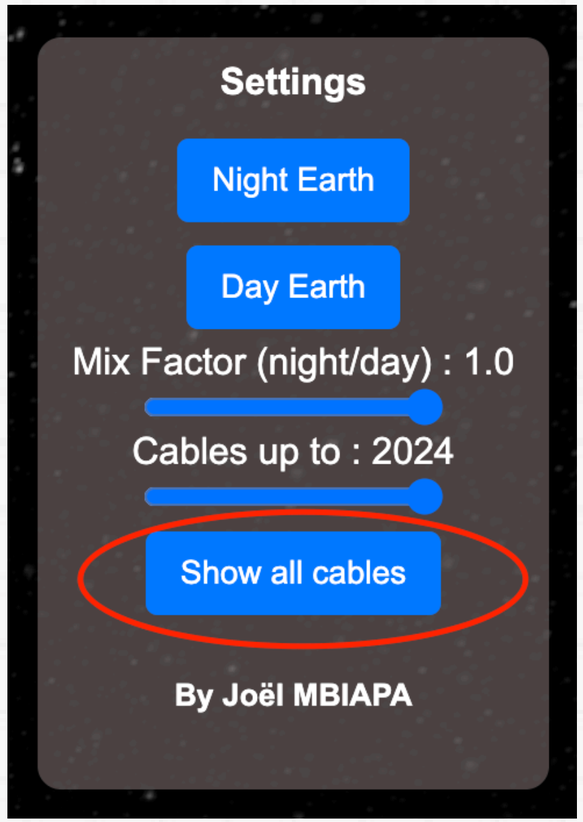
- Settings menu with additional interactive options : filtering

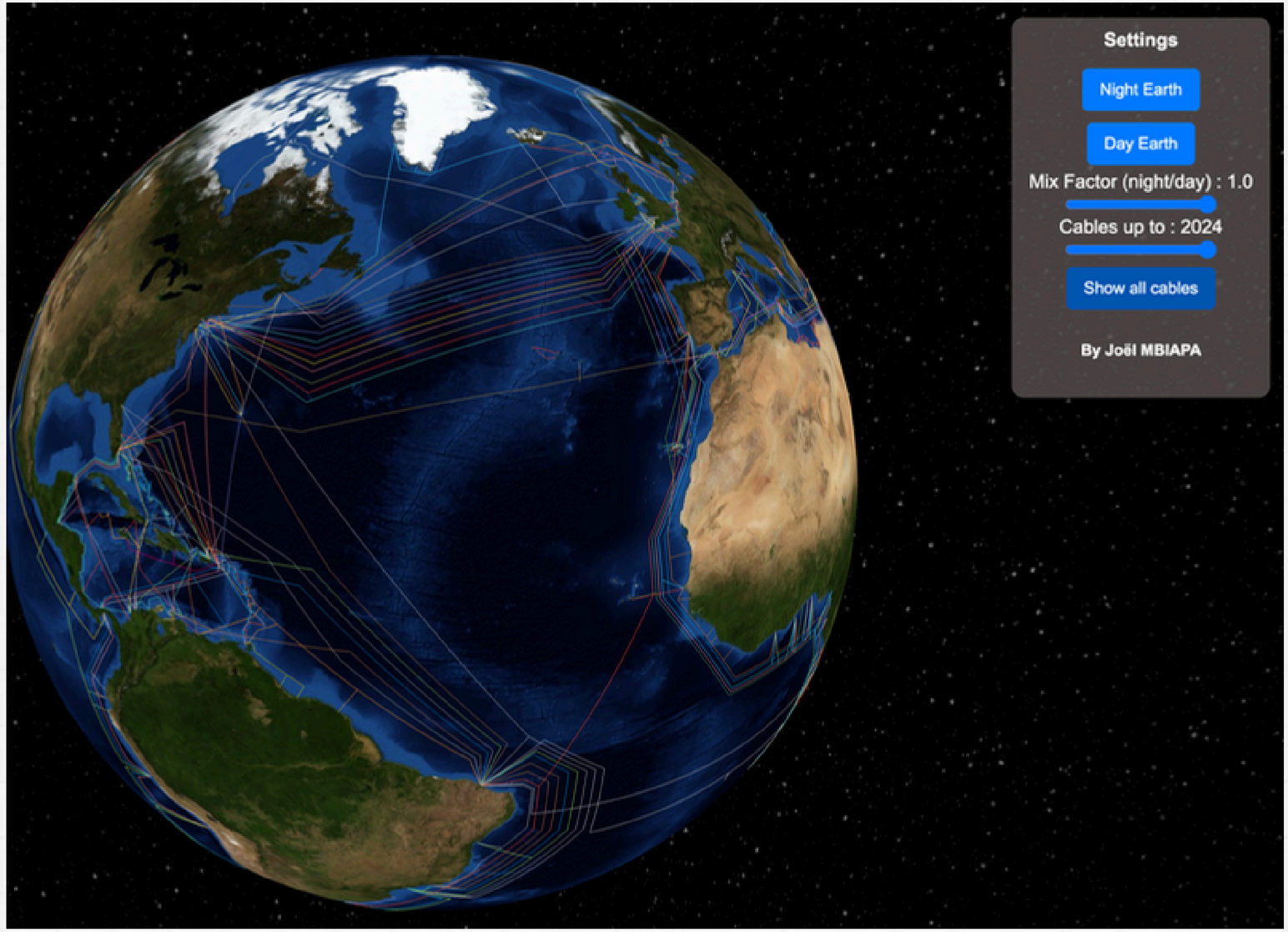




Implementation details

- 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 !