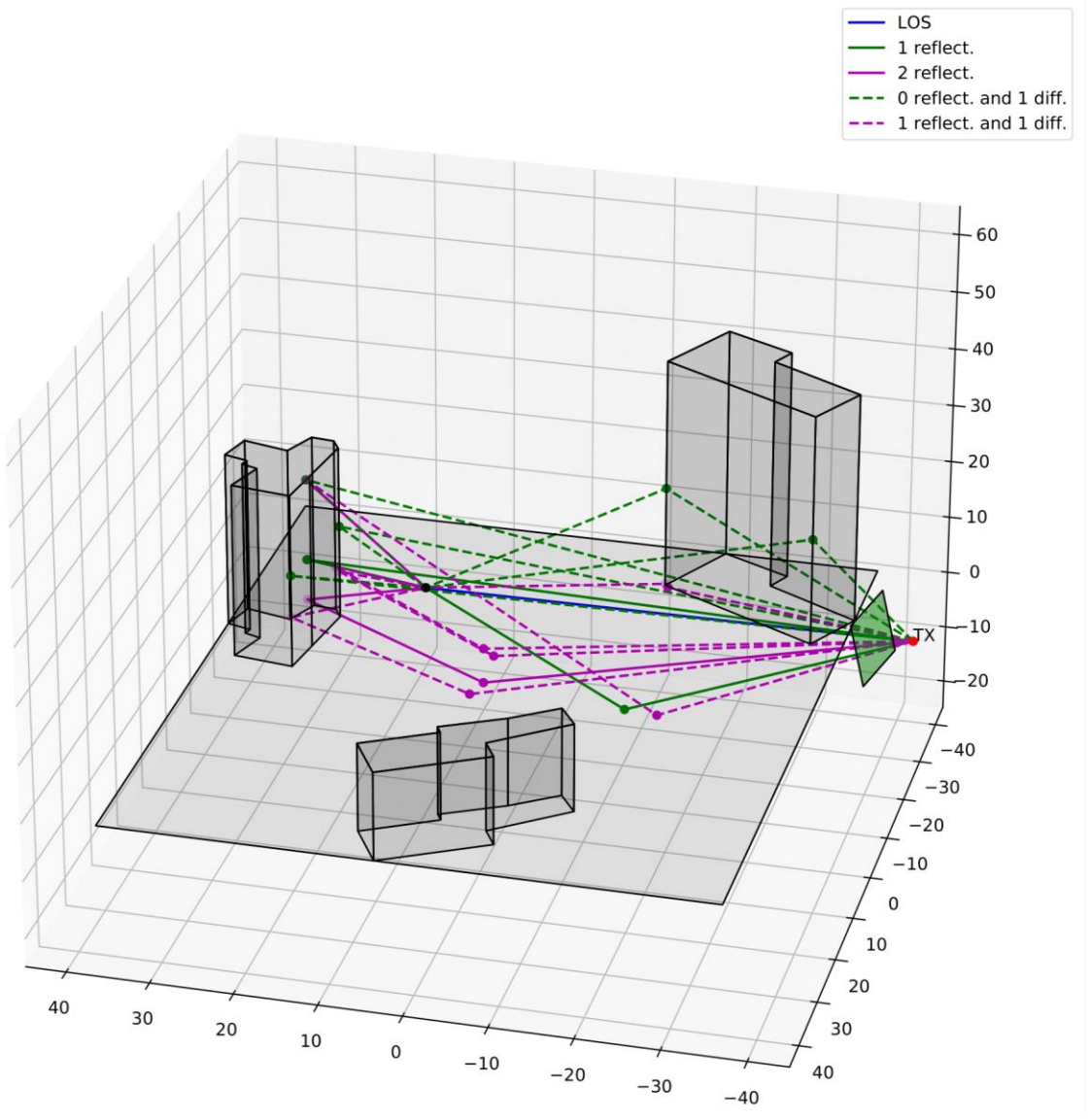
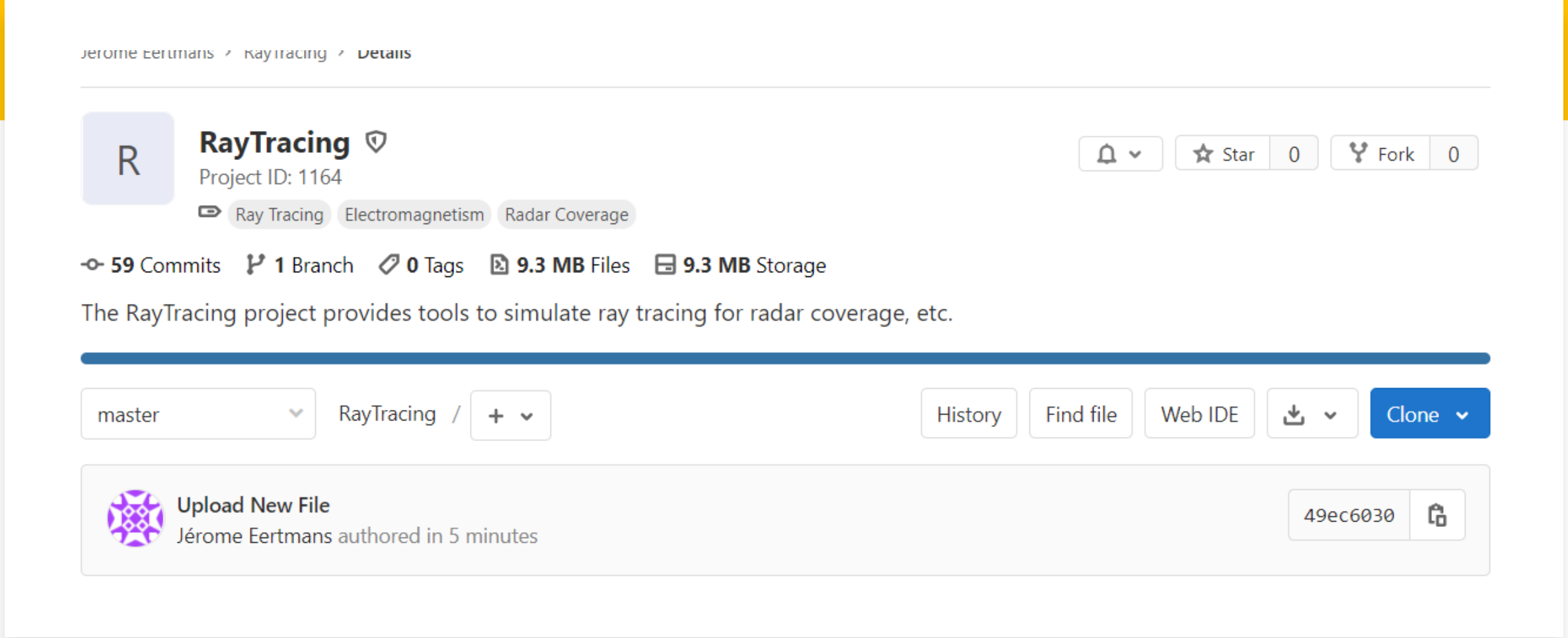


Presentation

RayTracing project

Why using Python version vs. Matlab old one ?

- Scalability
- Performances
- Intuitive interface
- Object-oriented programming
- Python is free!
- 3D animations for debugging purposes



How to setup the project ?

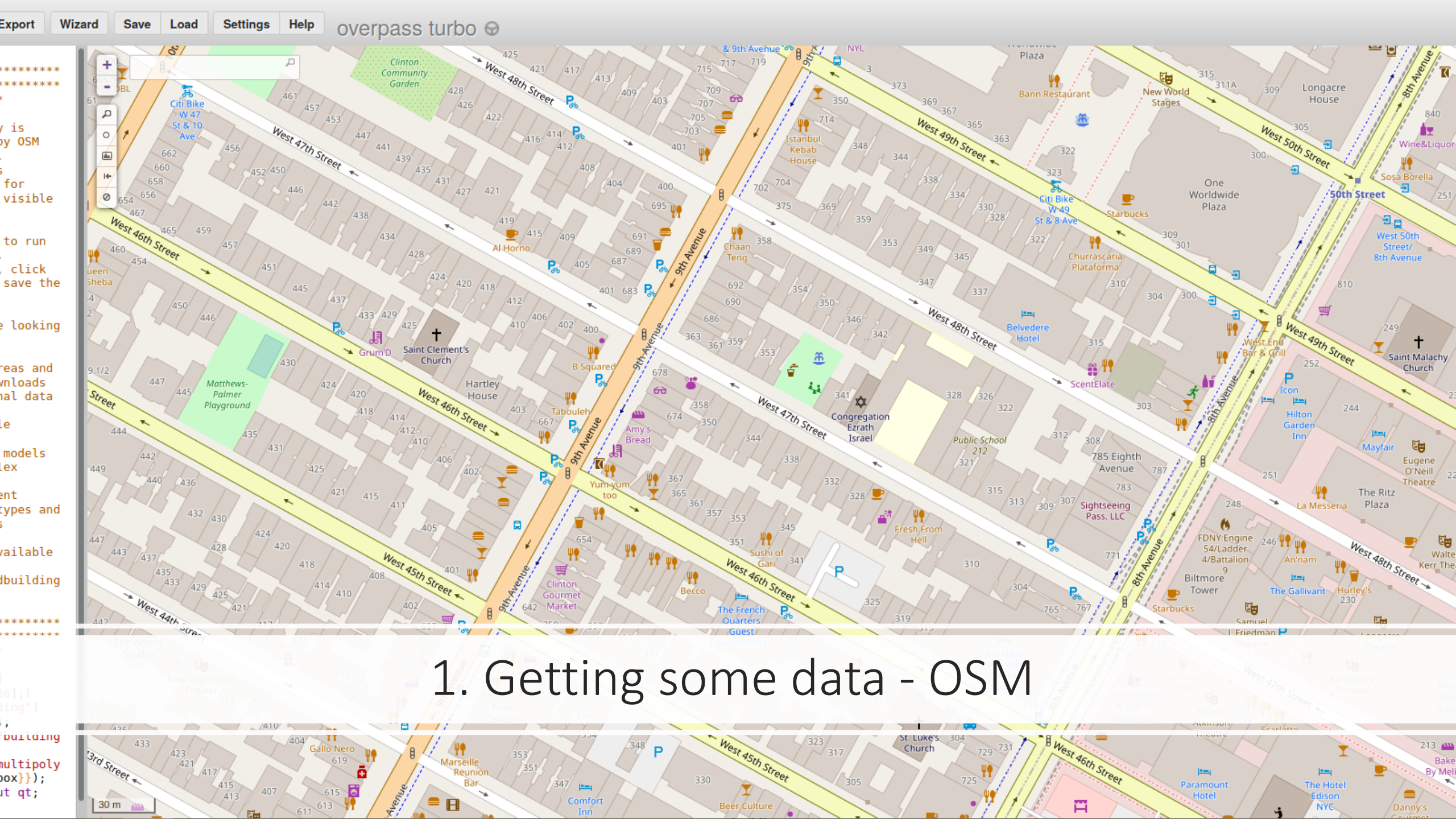
- Go to https://forge.uclouvain.be/eertmans/RayTracing
- Follow the `README.md' instructions:
  1. Clone the repository
  2. Install Python
  3. Setup a virtual environment
  4. Install the packages

How to use the project ?

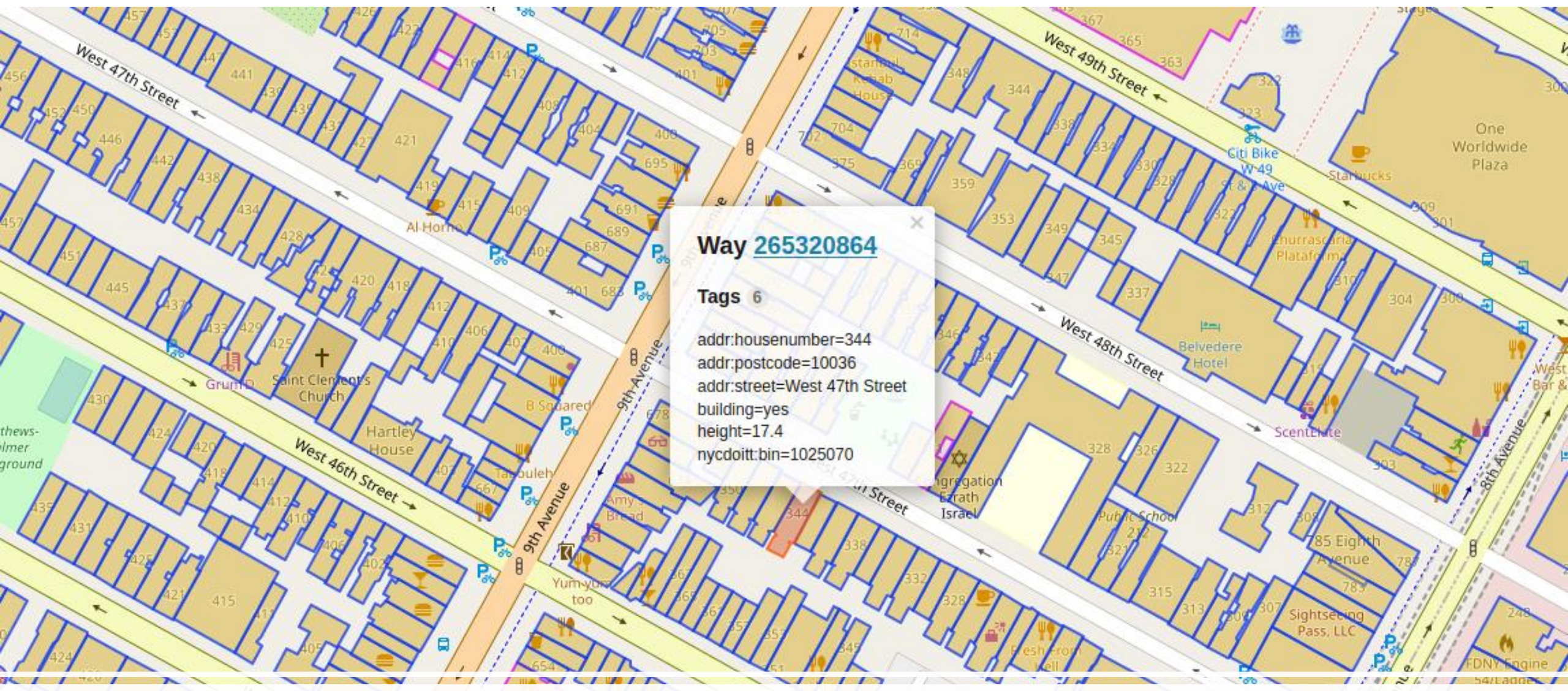
Let’s go through an example !

1. Getting some data

- Instructions in https://forge.uclouvain.be/eertmans/RayTracing/-/tree/master/data
- Data can be obtained/built via:
  - Open source projects (ex.: OpenStreetMap)
  - Open source softwares (ex.: QGIS)
  - Commands using the `geometry.py` library or the command-line tools



1. Getting some data - OSM

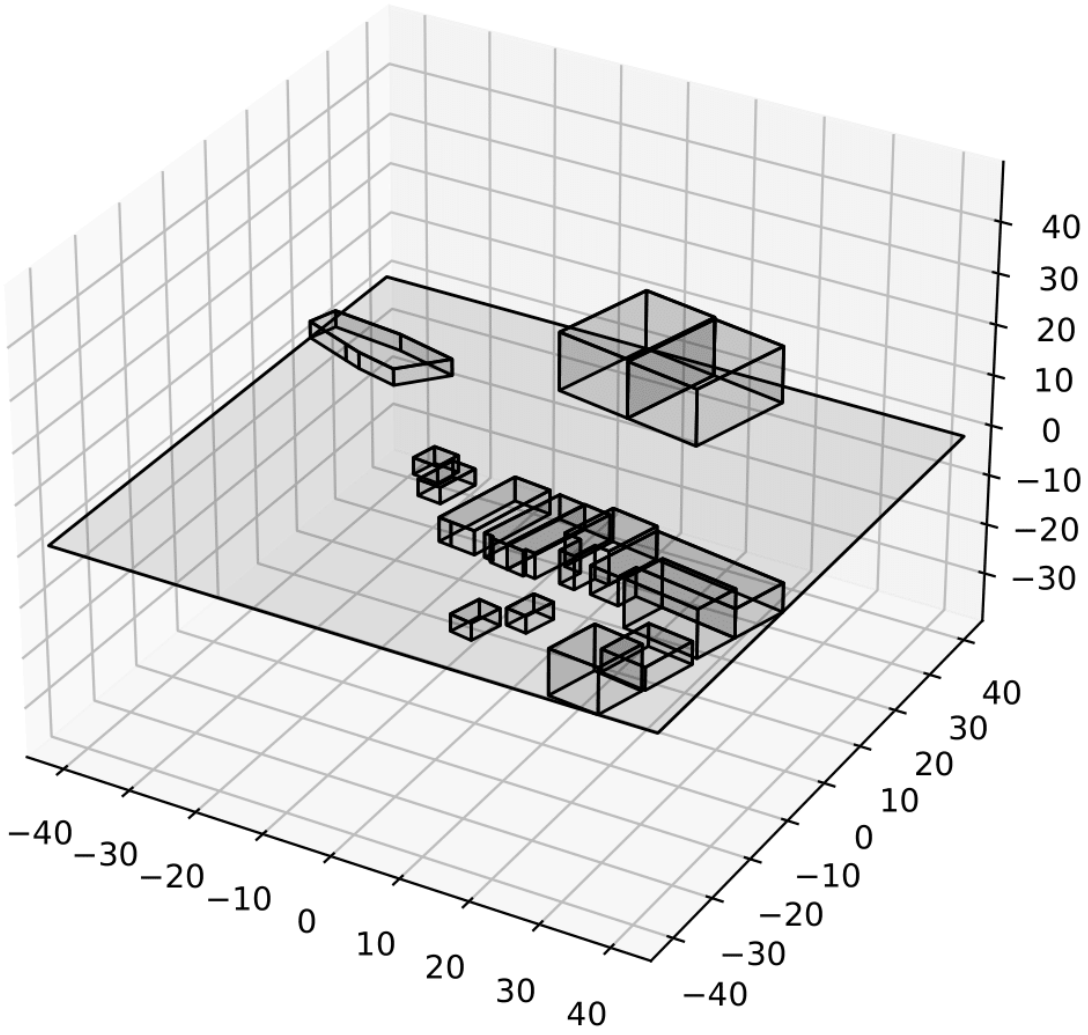


1. Getting some data - OSM

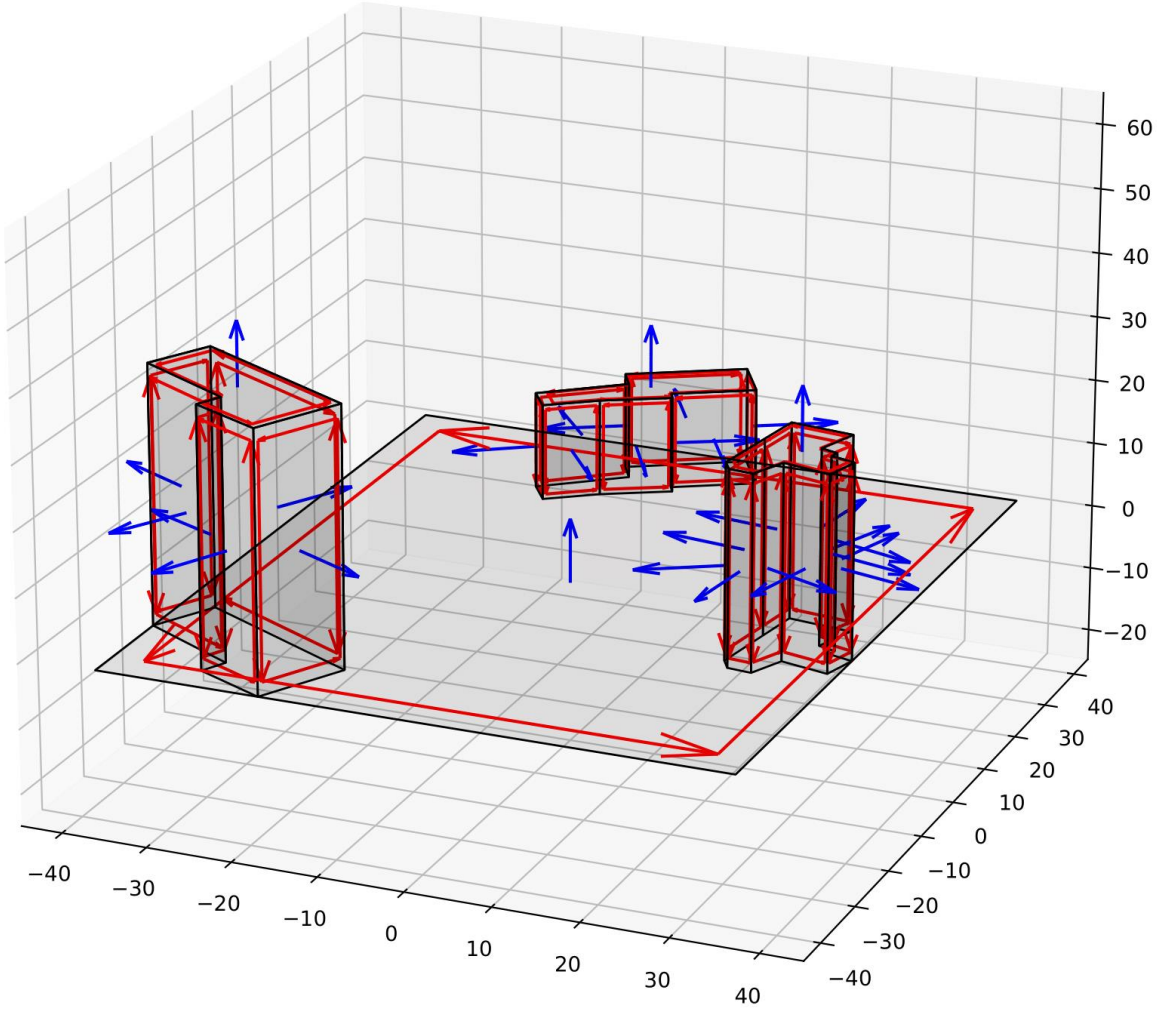
2. Plotting the data

Good to verify:

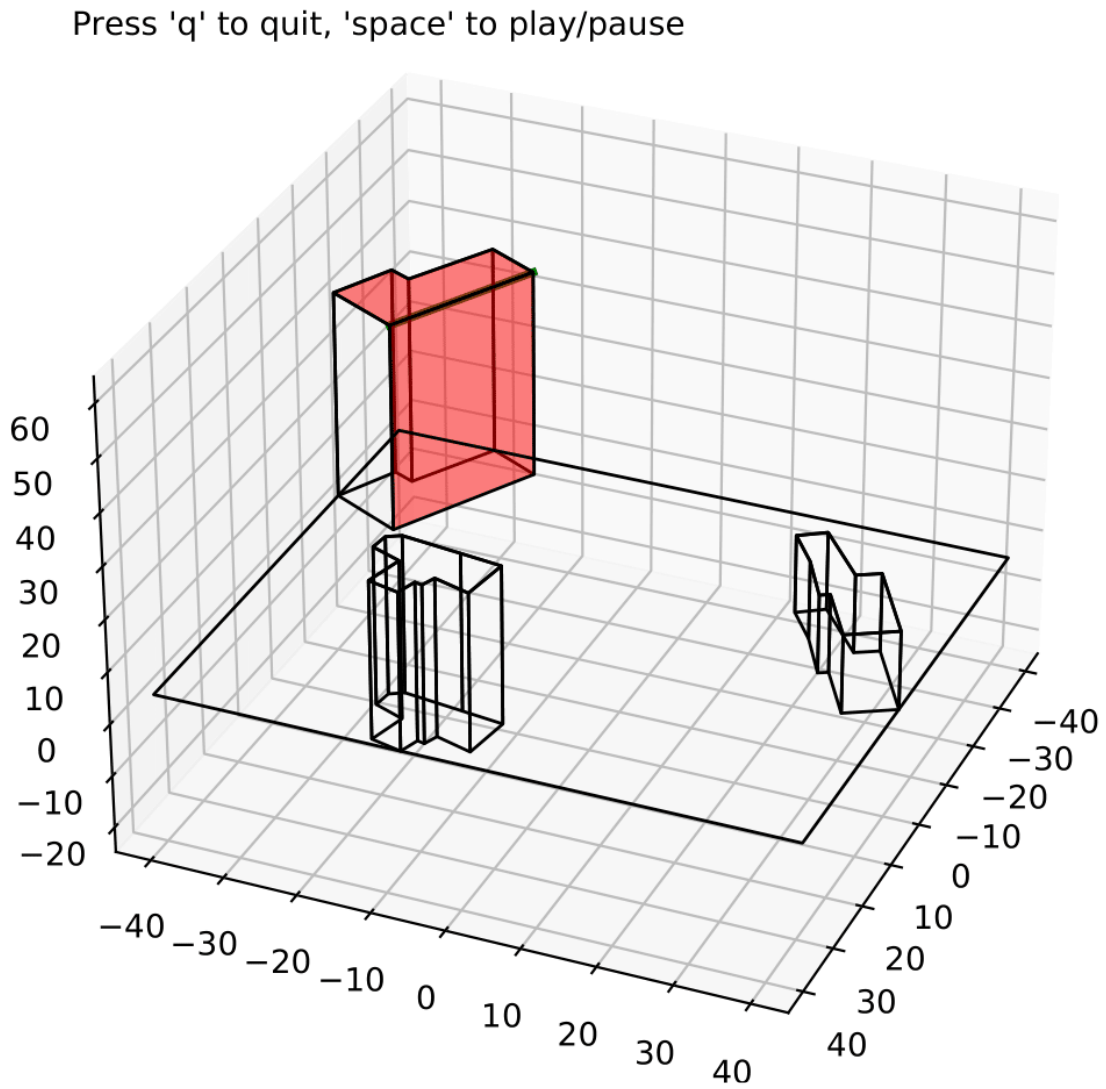
1. Correctness of data
2. Orientation of surfaces
3. Detection of sharp edges
4. Visibility matrix (NP problem)



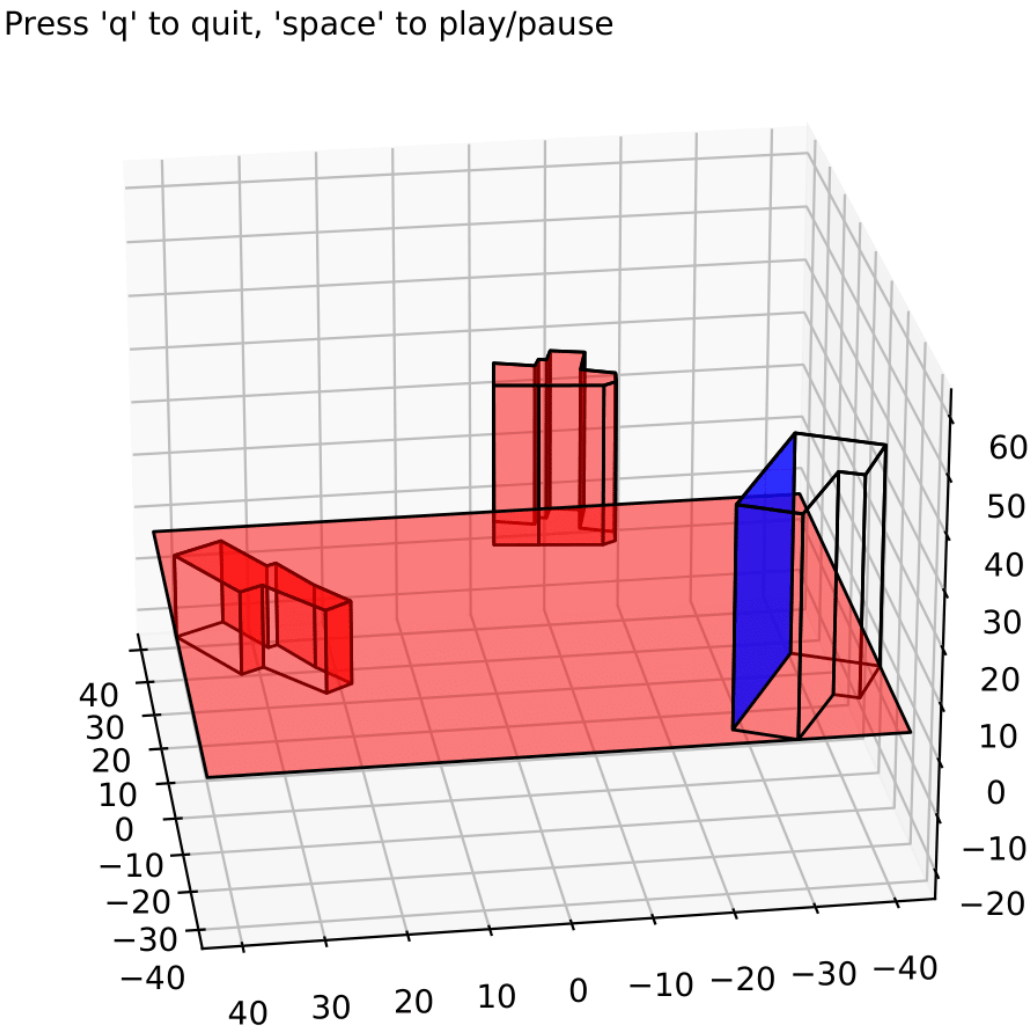
2.1 Correctness of data



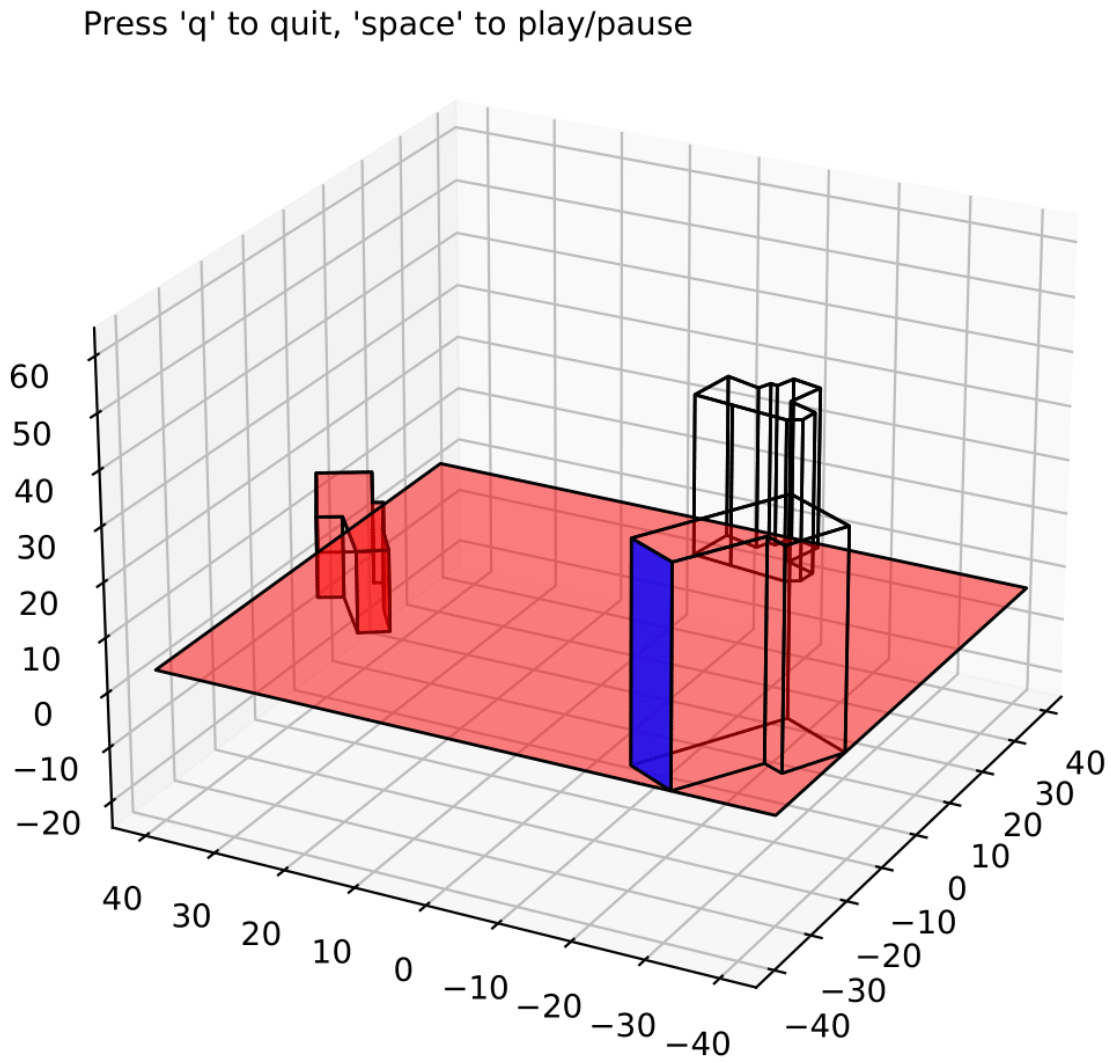
2.2 Orientation of surfaces



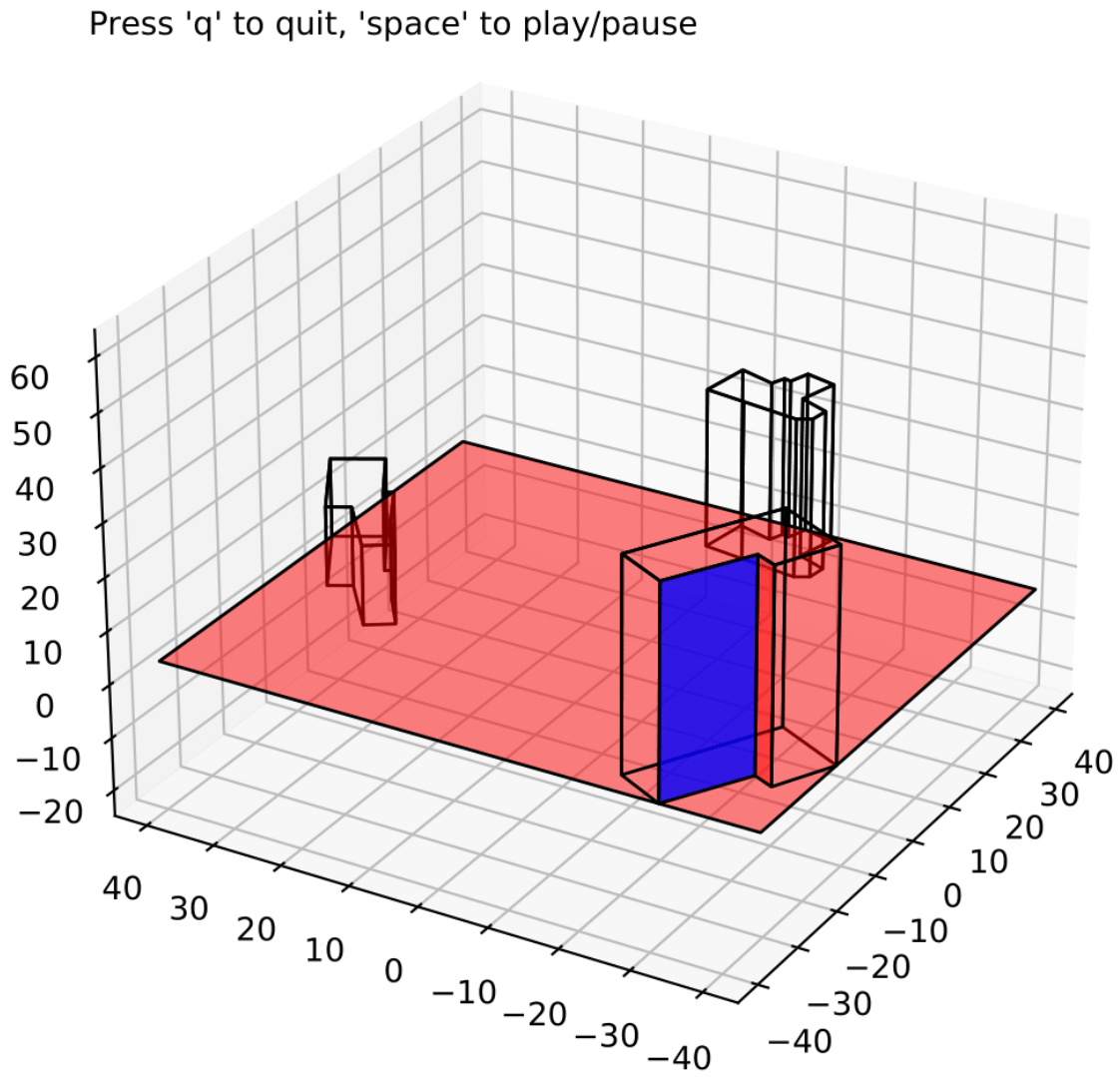
2.3 Detection of sharp edges



2.4-A Visibility matrix (NP problem)



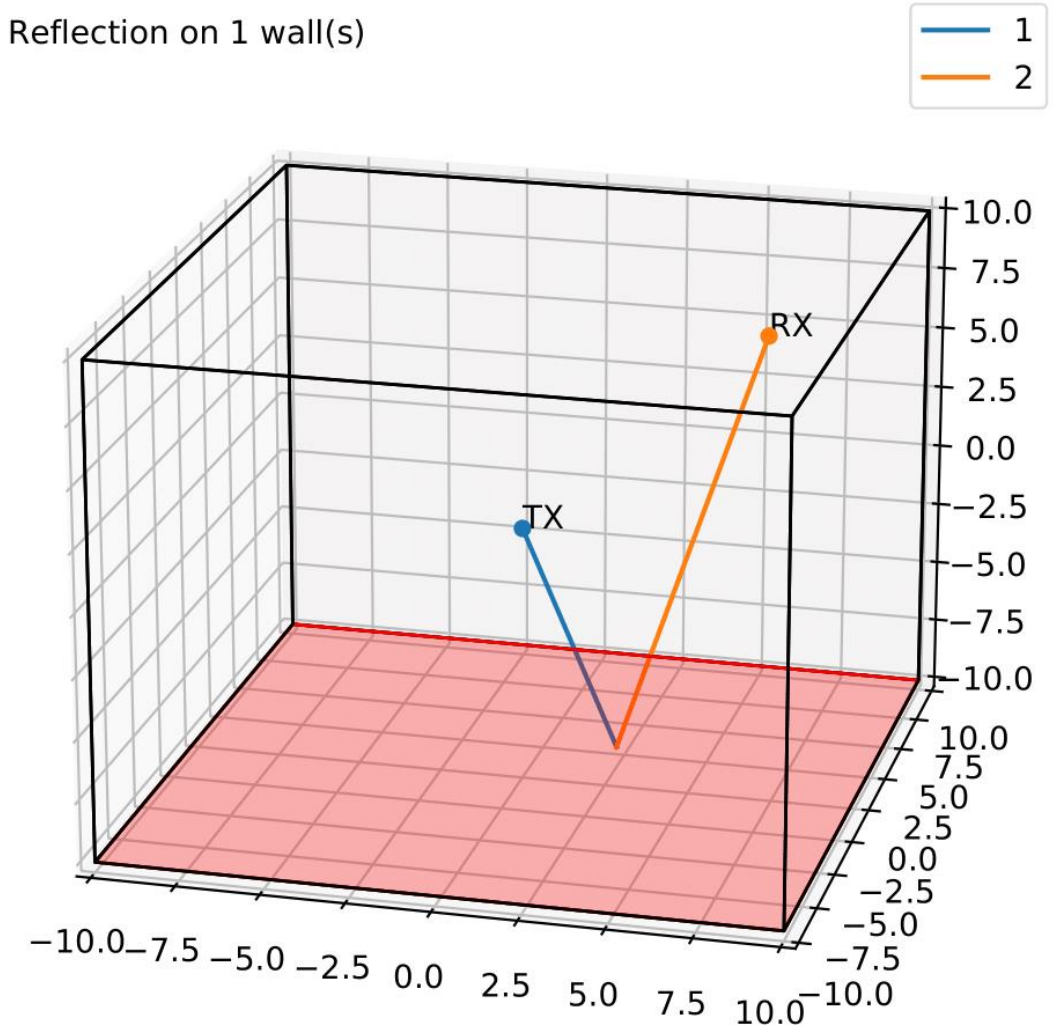
2.4-B Visibility matrix (NP problem)



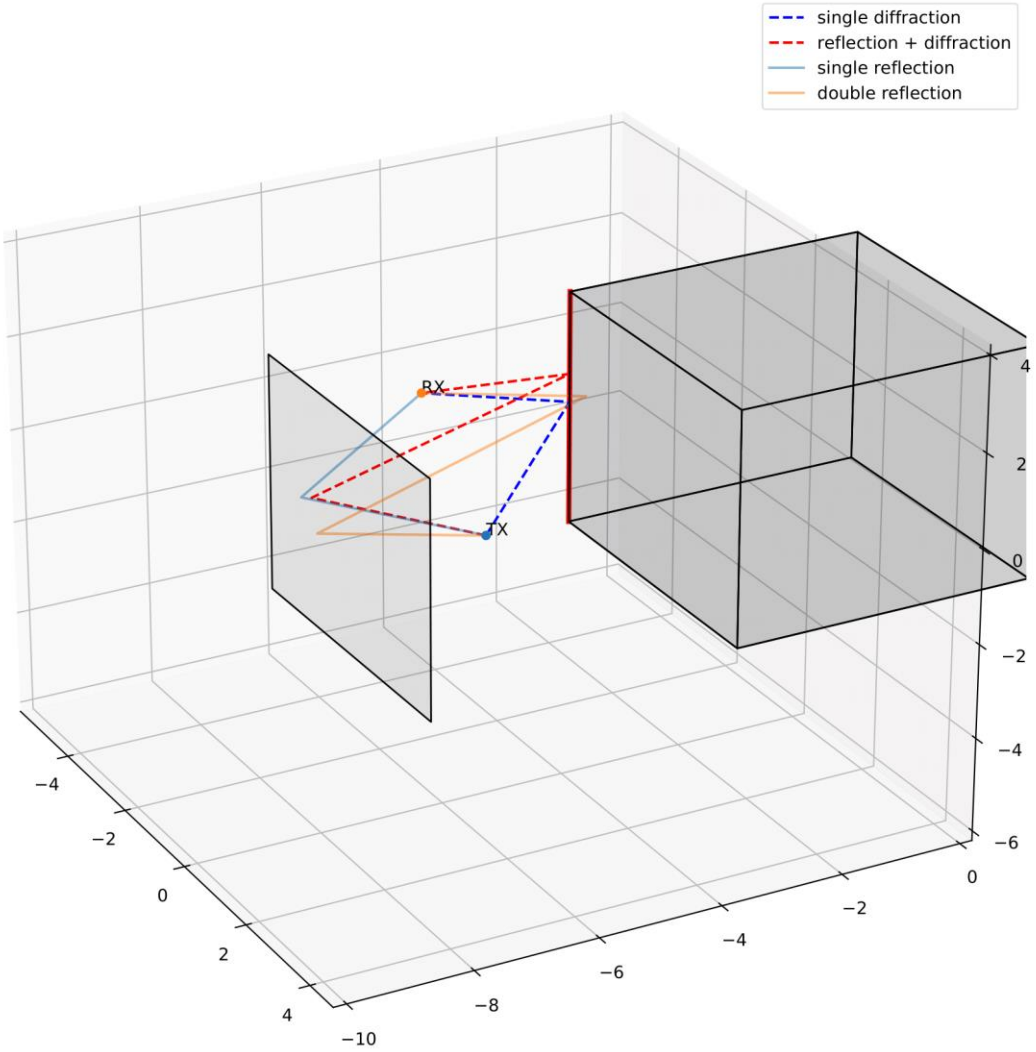
2.4-C Visibility matrix (NP problem)

3. Ray tracing

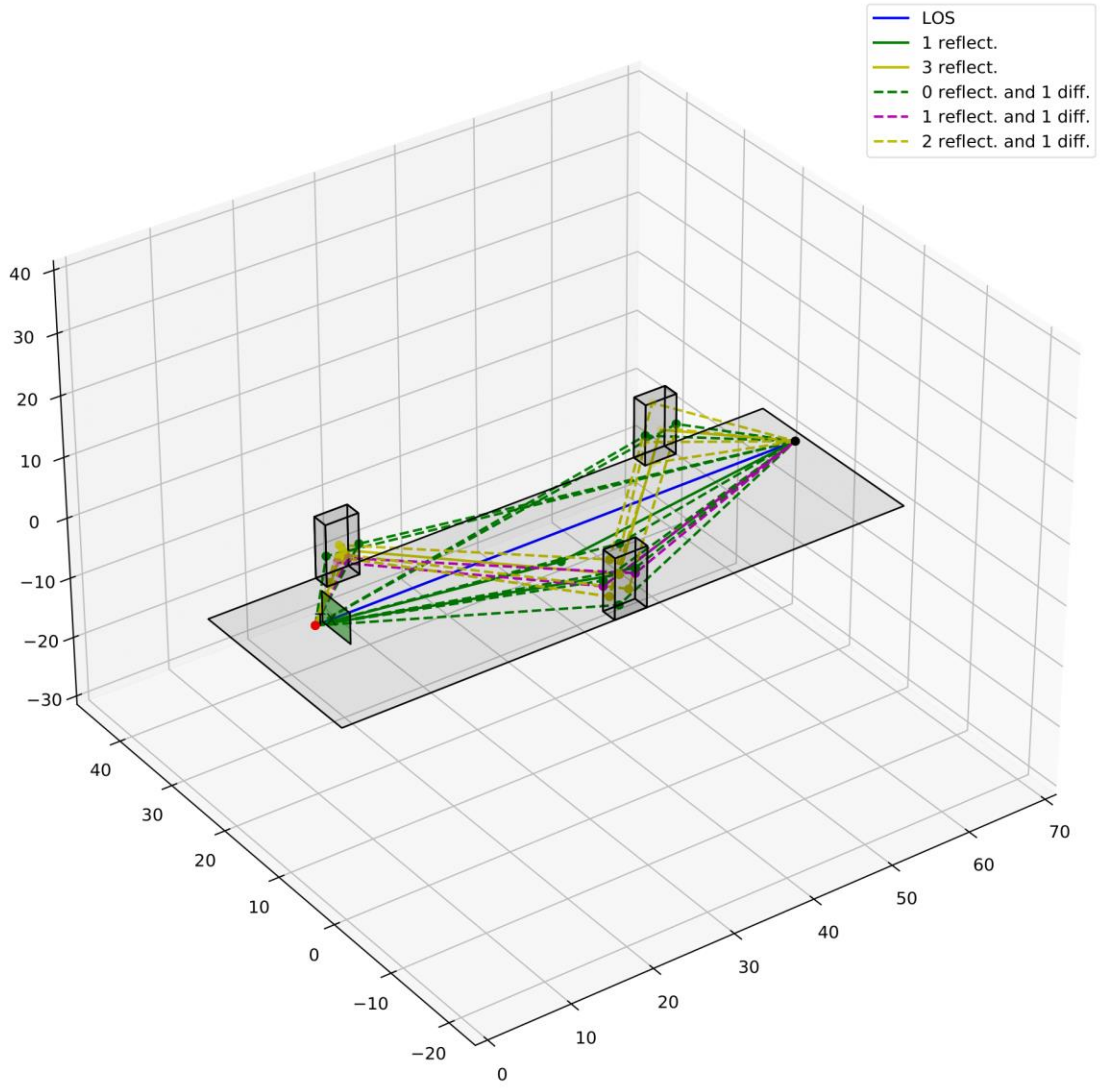
1. Reflection(s)
2. Diffraction
3. Multiple reflection(s) and diffraction



3.1 Reflection(s)



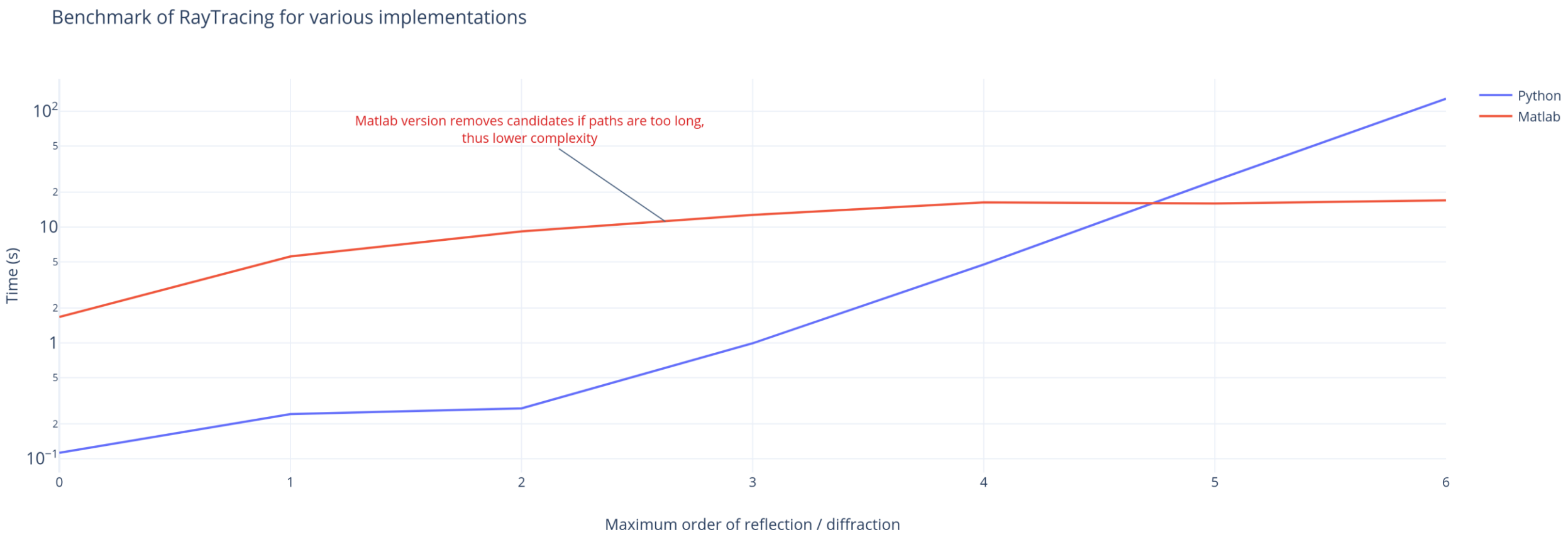
3.2 Diffraction



3.3 Multiple reflection(s) and diffraction

4. Post-processing

- Save geometries in json-like files
- Re-use or modify geometries
- Compute received power at given position(s) from ray tracing
- Etc.



4.1 Comparing Matlab and Python versions

5. Read the documentation

You can generate the documentation and read it:

- It is better than reading thousands of lines of code
- It can be open in any browser

6. Questions ?

If you find any problem, I encourage you to use Gitlab's issues and merge requests:

- Issues at https://forge.uclouvain.be/eertmans/RayTracing/-/issues
- Requests at https://forge.uclouvain.be/eertmans/RayTracing/-/merge_requests

Feel also free to contact me: Jérome Eertmans