

## ASSIGNMENT 10

In this assignment, we will practice some operations with 3D meshes and point clouds using PyTorch3D. We are going to load individual data files from the disk to build the appropriate data structure and visualize it using both a differentiable renderer and the Plotly viewer. It's also an opportunity for us to explore

### The goals of this practice are the following:

- Make simple operations with tensors
- Load meshes from files
- Apply Transformation to Meshes
- Assemble simple scenes with more than one element
- Make batched operations
- Render textured meshes and colored pointclouds using the forward pass of a differentiable renderer

## Instructions:

If you're using Google Colab, you just need to have a google account and an associated Google Drive. Make a copy of the notebook located below and modify it as requested.

In case you're choosing to work locally in your machine you must set Anaconda or a `venv` virtual environment, and install the necessary libraries. Create a folder in your Google Drive or in your machine's workspace. Copy to your drive folder or download the following notebook:

[Assignment 10 Notebook](#)  [Open in Colab](#)

1. Follow the instructions in the notebook for completing the assignment.
2. If you want, you can build auxiliary .py scripts and call them from your notebook, for organizational purposes.

## Submission

The assignment is due on June 12th, 2023 at 11:59pm (GMT-3).

Students should send their assignments before the due date to hallpaz@impa.br with a copy to lvelho@impa.br. Late delivers will be consider subject to a lower score.

The submission email should be sent with the subject "Assignment 10 - [first-name] - [last-name]". The assignment can be structured and sent in two ways:

If your whole solution is implemented in the same notebook as the one provided for the assignment, then you can send just the .ipynb file as the solution. If parts of your implementation were done in auxiliary .py scripts, then you must send both the final notebook and the scripts inside a .zip file. The organization of the code will also be considered in the evaluation.

## References:

1. PyTorch3D: [Getting Started with Renderer](#)
2. Luiz Velho, Jonas Gomes. [Fundamentos de Computação Gráfica](#). Capítulo 11 "Câmera Virtual".
3. [Pulsar: Efficient Sphere-based Neural Rendering](#)

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Assignments and Notes for the course 3D  
Graphics Systems @IMPA 2023