NeRF project

Exercise 4

Advanced Deep Learning in Computer Vision

September 2023

In this exercise, you are asked to build a NeRF model and analyze its performance. You should make a pdf report. Here you can see some example scenes:

Figure 1: Example scenes

You tasks are as follows:

1. Sample linearly between `near` and `far` at the function `sample_stratified`. (See files `nerf_helpers.py` and `playground.py`)
2. Complete the implementation of the `Embedder` module. (See files `model.py` and `playground.py`)
3. Implement the forward function of the NeRF model and render a video using a pre-trained model. (See files `model.py` and `playground.py`)

4. Render a video with a constant viewing direction. Are the results the same?
   (See files `nerf_helpers.py` and `playground.py`)

5. Complete the training loop and train your own Nerf model at a different scene(s).
   (See the file train.py)

Notes:

- If the rendering process takes too long, reduce the `TARGET_SIZE` (line 75 `playground.py`)
- You will train with images 50×50 and a smaller network. Therefore, the results of the pre-trained model will be better.
- The default scene of `train.py` is 'chair'. To train on a different scene: `python train.py --scene-name <name>`. Each config file corresponds to a different scene.
- Do not change neither the names of the layers in the NeRF model nor the scene name at the `playground.py`