

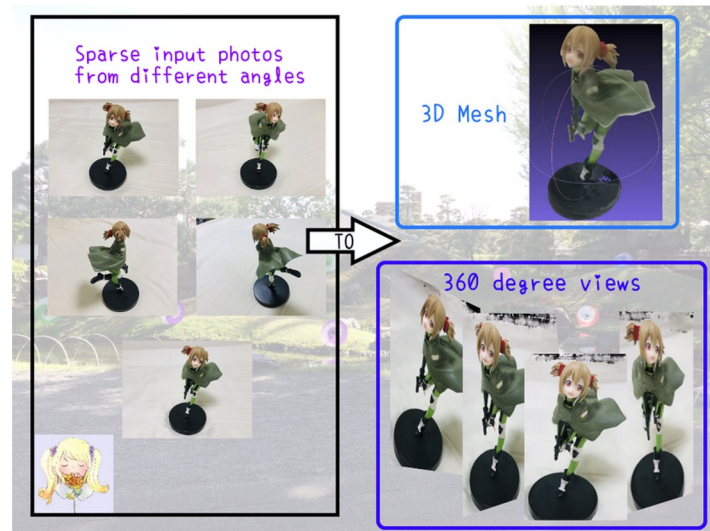
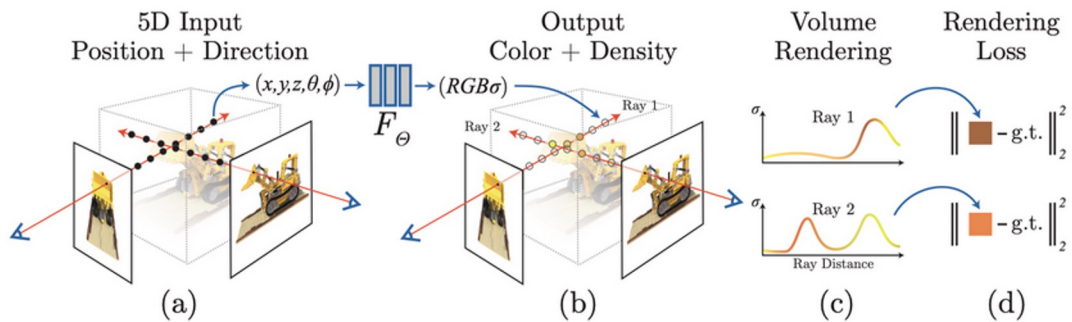


影像處理概論

Introduction to Image Processing

作業二：影像處理與影像生成實習

NeRF (Neural Radiance Fields)



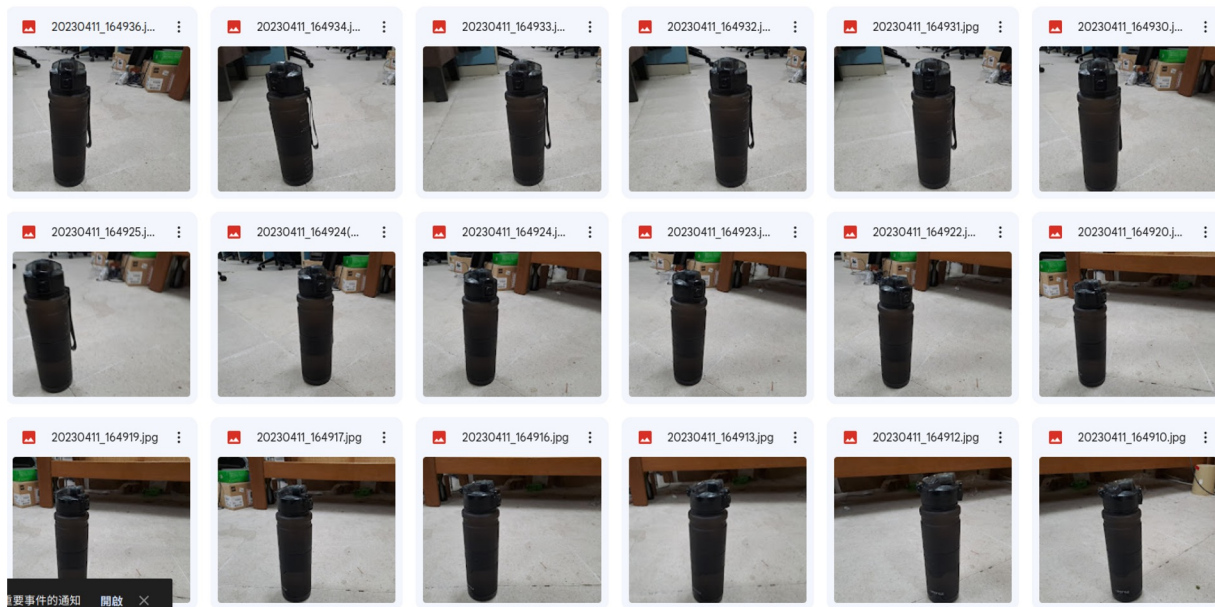
https://github.com/kwea123/nerf_pl



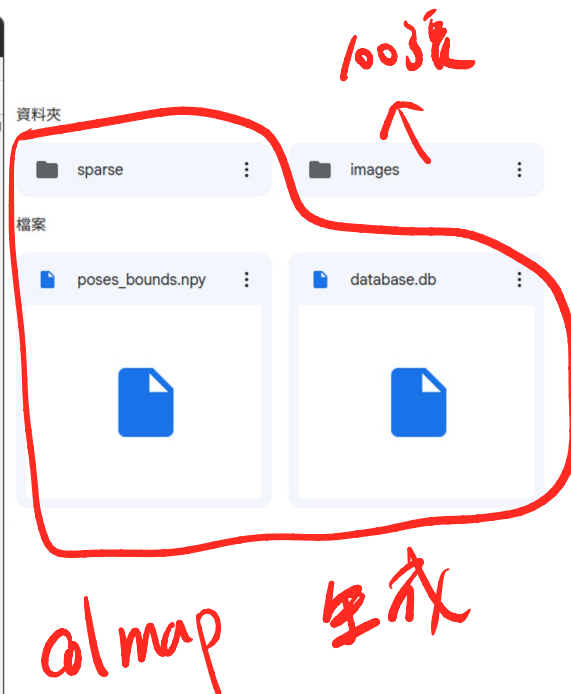
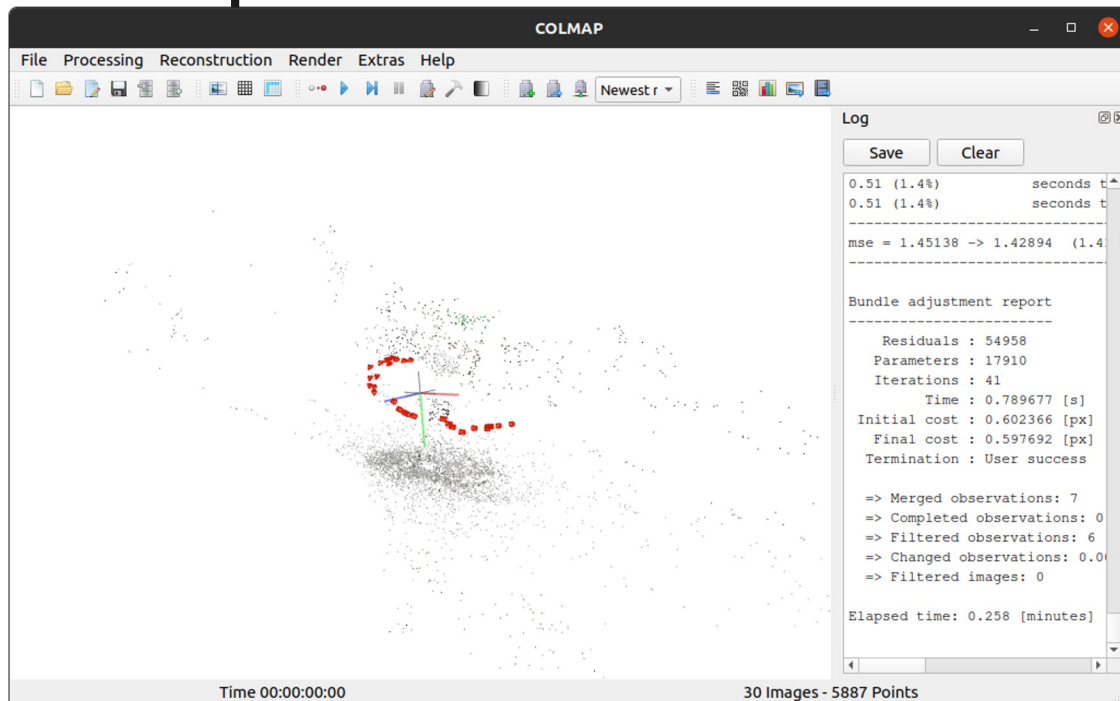
作業流程圖



訓練資料



Colmap



Training / Testing

```
/content/nerf_n1
INFO:lightning:GPU available: True, used: True
INFO:lightning:VISIBLE_GPUS: 0
val image is /content/drive/My Drive/colab/nerf/nerf_llff_data/fern/images/IMG_4038.JPG
2020-04-26 09:16:47.901672: I tensorflow/stream_executor/platform/default/dso_loader.cc:44] Successfully opened dynamic library libcudart.so.10.1
0it [00:00, ?it/s]/usr/local/lib/python3.6/dist-packages/pytorch_lightning/utilities/warnings.py:18: RuntimeWarning: Displayed epoch numbers in the progress bar start from "1" until v0.6.x, but will start from "0" in v0.8.0.
  warnings.warn(*args, **kwargs)
Epoch 1: 100% 3535/3536 [11:00<00:00, 5.35it/s, loss=0.014, train_psnr=22.2, v_num=0]
Validating: 0% 0/1 [00:00<?, ?it/s]
Epoch 1: 100% 3536/3536 [11:11<00:00, 5.27it/s, loss=0.014, train_psnr=22.2, v_num=0, val_loss=0.0149, val_psnr=21.3]
Epoch 2: 100% 3535/3536 [10:59<00:00, 5.36it/s, loss=0.012, train_psnr=22.5, v_num=0, val_loss=0.0149, val_psnr=21.3]
```

```
100% 120/120 [20:48<00:00, 10.41s/it]
```

Colaboratory

Google Workspace Marketplace

colab

所有篩選器

適用容器：

價格

以下查詢的搜尋結果： colab

Google 不會驗證評論和評分。 [進一步瞭解評論和結果](#)



Colaboratory
Colaboratory team

This allows Google Colaboratory to open and create files in Google Drive. It L...

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TensorFlow Decision Forest ...

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資料夾上傳

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Google 簡報

Google 表單

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目前使用量：406 MB (儲存空間
剩餘：15 GB)

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Google 協作平台

Google Apps Script

Google Jamboard

+ 連結更多應用程式

<https://medium.com/python4u/google-colab-%E6%95%99%E5%AD%B8-1-python-%E9%9B%B2%E7%AB%AF%E9%96%8B%E7%99%BC%E7%92%B0%E5%A2%83%E5%AE%89%E8%A3%9D%E8%88%87%E5%BF%AB%E9%80%9F%E5%B0%8E%E8%A6%BD-78942200525f>

torchsearchsorted (colab)

```
[ ]
%cd /content/drive/MyDrive/image_process/torchsearchsorted
!pip install .

/content/drive/MyDrive/image_process/torchsearchsorted
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Processing /content/drive/MyDrive/image_process/torchsearchsorted
Building wheels for collected packages: torchsearchsorted
  Building wheel for torchsearchsorted (setup.py) ... error
    ERROR: Failed building wheel for torchsearchsorted
  Running setup.py clean for torchsearchsorted
Failed to build torchsearchsorted
Installing collected packages: torchsearchsorted
  Running setup.py install for torchsearchsorted ... error
ERROR: Command errored out with exit status 1: /usr/bin/python3 -u -c 'import sys, setuptools, tokenize;
```



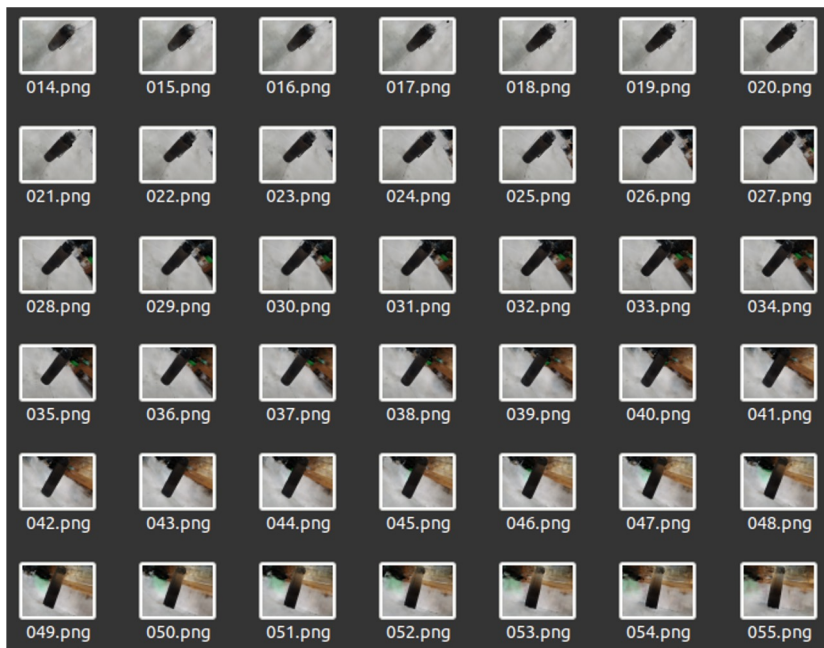
model/redering.py

```
import torch
from torchsearchsorted import searchsorted

42 inds = searchsorted(cdf, u, side='right')
43 inds = torch.searchsorted(cdf, u)
```

```
42 # print("u , cdf ", u.size() , cdf.size())
43 inds = torch.searchsorted(cdf, u)
```


生成結果





作業繳交要求

1. 程式碼 (使用到的尤其有個人修改者)

2. 報告 (.docx或.pdf)

- 原理與名詞解釋。
- 實作之步驟過程說明。
- 觀察並比較討論不同epoch對於訓練後生成結果的表現。
- 針對整體結果分析討論，並探討NeRF架構方法之優缺點。
- 【自由選擇加分項】嘗試調整模型來提升生成表現，並比較說明改善的理由及方法。

3. 訓練資料集 (蒐集拍攝的所有照片)

4. 生成結果 (輸出生成的所有圖片與gif檔)



作業繳交期限

- 請將所有檔案壓縮進「**IP_name_yourstudentID_HW2.zip**」再上傳至E3。
- 本作業繳交期限為兩週後課堂前 **5/5 10:10**，請務必留意時間不要遲交。
- 其他資訊與完整spec請參見E3作業區，有任何狀況也請E3寄信前來詢問。