Deep learning for solar panel recognition

Model weights - https://drive.google.com/file/d/1m5xlnTfs6qFeMR7mrD-m5nLPOMuNCIcU/view?usp=sharing

1. Code to generate image tiles and then splitting them using google maps api

1. Open the download.py file which is in the src directory
2. In the function **download_gmaps_api()** enter the location of the folder where you want to generate the data to and assign the **GMAPS_KEY** to the api key.
3. In the **def main** function assign the location provded earlier to the **folder** variable and in the dictionary title **PLACES** enter the name of location and diagonally opposite corner of the region of interest
4. Run download.py
5. The code breaks the region of interest into multiple tiles of 1280X1280 pixels
6. The split function further breaks down the 1280X1280 tile into images of 256X256
7. The folder titled **SPLIT** inside the folder containing the tile images (provided earlier) contains the individual split of the of the tiles and will be used for inference.

2. Code to run the app.py – To run a streamlit web app

1. Clone the repository in google drive
2. Mount the google drive in notebook
3. Open the app folder directory in the repository
4. Install the requirements
5. Generate a **local tunnel key** for the web app using the following code **! wget -q -O - ipv4.icanhazip.com**
6. Next use the command to generate the link for the locally hosted web app
7. Type in **"y"** to generate the url and after opening the url enter the previously generated local tunnel key to access the web app.

3. Running the inference in colab notebook used for testing on datasets

1. Go to **src/model** directory
2. Generate the segmentation model pytorch module for using in the colab environment by running the following script:
3. In the **deply3() function** provide the path to the folder containing the images of the dataset also provide the path to the model directory in **model_dir**
4. You will be prompted to select the model architecture and the backbone, The best performing model and backbone so far is number 4.
5. Net you will be prompted to enter in the spatial resolution of the dataset
6. The spatial resolution of the image can be identified using the function **calculate_spatial_resolution** provided (the spatial resolution depends on the coordinates of the images taken)
7. Run the script provided in the notebook to run inference on the data folder.