User Manual: Geolocation-to-Pixel Mapping in Nadir and Oblique UAV Images

This guide walks you through running the notebook step-by-step to convert the address into latitude, longitude, and pixel coordinates in UAV images and to visualize cropped and annotated outputs in both nadir and all available cardinal oblique views.

Step 1: Create a Google Maps API Key (for Geocoding)

- Visit Google Cloud Console.
- Create a new project or select an existing one.
- Navigate to APIs & Services > Credentials.
- Click on “Create Credentials” > “API key”.
- Enable the Geocoding API and Maps Static API in the Library section.
- Copy the generated key for use in the notebook.

Step 2: Upload Image, Metadata and Offset Model

- **Image Files**: Make sure to upload the UAV images from Google Drive or local storage. Ensure that the images are available, especially for the area where you are searching for the address.
- **Metadata File**: This CSV file contains UAV image metadata such as image name, drone position, altitude, heading, and gimbal pitch. Ensure that the images corresponding to the metadata entries are available.
- **Offset Model Files**: We have provided pre-trained models named model_dx and model_dy. If you'd like to train your own models, the notebook includes the training code at the end, along with a dataset (offset_data_v2.xlsx)

Step 3: Run the Notebook in Google Colab

- Run all cells except the last one, which is for training
- Provide the Google API key, image path, and metadata file path before executing the main step
- Then, run the main execution.
- Enter an address as input, e.g., PWPC+V3F Lakewood, Colorado, USA.
- If a building is found, the notebook will proceed to crop and annotate images from the nadir view and four oblique directions (North, South, East, West).
- Cropped and annotated images are saved in the folders cropped_images and annotated_images, respectively.

Note

- The provided offset correction models (model_dx, model_dy) were trained using data from the DJI camera model FC3682.
- If no building is detected at the input address, the notebook will print a message and stop further processing.