GNR602 PROJECT: HOG Implementation

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1 HOG implementation steps

1. Preprocess the image to compute gradients and magnitudes.
2. Divide the image into cells and calculate histograms of gradients for each cell.
3. Normalize the histograms within blocks to handle changes in lighting and contrast.
4. Concatenate block histograms to form the final feature vector.
5. Train the SVM for prediction using the feature vectors obtained.

2 Steps to run the code

1. Run the code snippets of **training.ipynb** on Jupyter Notebook, or execute the Python file **training.py** using the command line: **python3 training.py**.
2. This will generate a labeled data file named **data.npy**, using input images from the **images-water** and **images** folders.
3. Run the code snippets of **cropped_image_generate.ipynb** on Jupyter Notebook, or run the Python file **cropped_image_generate.py** using the command line: **python3 cropped_image_generate.py**.
4. A satellite image will pop up, allowing you to select the region for testing using the mouse. Press 'C' after selection. The cropped image will be saved as **crop.jpg** in the same folder and will be used as input for **testing.ipynb**.
5. Run the code snippets of **testing.ipynb** on Jupyter Notebook, or execute the Python file **testing.py** using the command line: **python3 testing.py**.
6. Select the input image you want to test. The model will detect whether it's a building or not.

3 Results to be seen

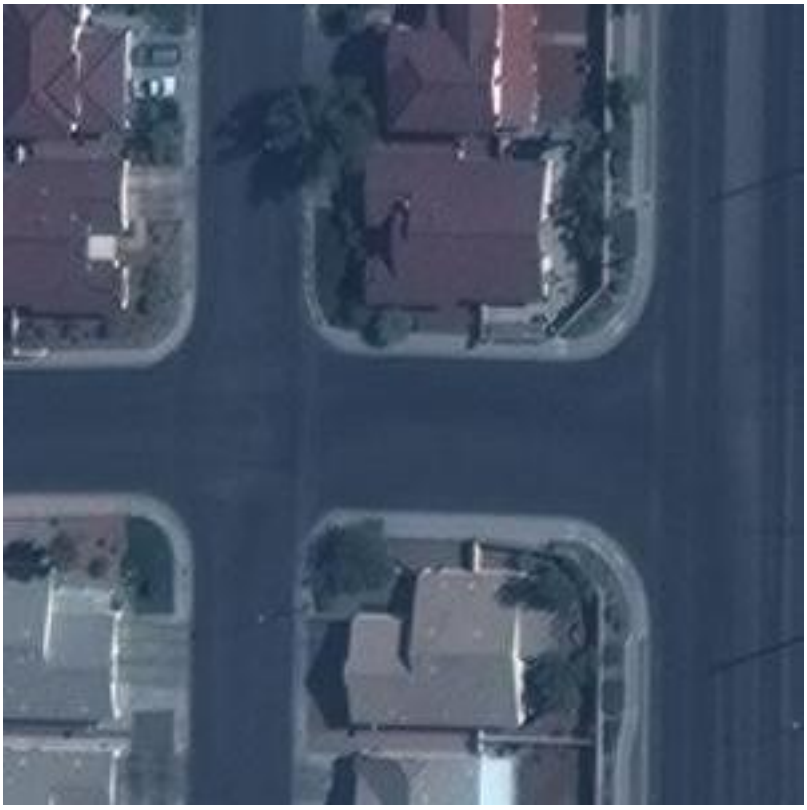

Figure 1: Input Image : Building

Expected Output:
Accuracy: 95.51%
The image is of a building.