

# Building Height Detection

## Image Processing (CS313a) – Project

Manjot Singh (2017330)

Arnav Deep (2017316)

This Project applies the paper “A Shadow-Overlapping Algorithm for Estimating Building Heights From VHR Satellite Images” by Kadhim *et al.*

PDF of the paper is in the Evaluation\_files folder.

## How to run

Simply run Project\_Final.m in a suitable environment and it'll output a result plot (result\_plot.jpg) and the height of all the buildings from the dataset.

For details on the process of the workflow, please refer to the document “Final\_presentation.pdf” in Evaluation\_files.

The comments in Project\_Final.m will also provide helpful insight.

## Dataset and Evaluation Folders

/Evaluation\_files – Contains the Paper and Presentation are located in

/Source Image – Contains Dataset for the project (5 images and their metadata.)

## Description of Scripts

1. Project\_Final.m has the complete code for every image written in order, with comments. Simply running it will provide the plot (same as in result\_plot.jpg) and the Jaccard Indexes of the all the 5 images in order.

2. Project\_Iteration.m consists of initial iterative code for all images. The difference between this script and Project\_Final.m is that in Project\_Iterative, Iteration is done to get optimal  $H_T^{\max}$  value for the formula:

$$L = \frac{H_T^{\max}}{\tan \phi R_{\text{img}}}$$

Here, to get  $H_T^{\max}$ , iteration from is done till an optimal Jaccard Index (JI) value is obtained. This JI value is the optimal height. The problem with this iteration is that it takes a very long time to complete processing, hence, it has been processed once and the optimal value are noted and used in Project\_Final.m.

3. Segmentation\_#.m (# = 1->5) are Scripts that contain a mask function to perform segmentation. They are used in Project\_Final.m and Project\_Iterative.m as mask functions for the input images.