



## 17. Given Google Maps satellite views of a city, identify the amount of greenery, urban cover

Github link: [https://github.com/anirudh456/DIP\\_project\\_Greenery\\_Cover](https://github.com/anirudh456/DIP_project_Greenery_Cover)

### Team members

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## Overview

### The problem:

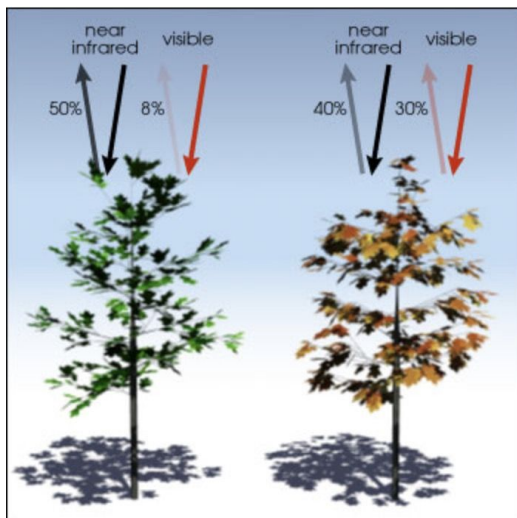
Given Google Satellite view of a city, identify the amount of greenery and urban cover. Green spaces play an important role in deciding the quality of life in urban areas. They decide the local micro-climate and the regional climate of the city. For example,

### Approach:

Live green plants absorb solar radiation in the [photosynthetically active radiation](#) (PAR) spectral region, which they use as a source of energy in the process of [photosynthesis](#). Leaf cells have also evolved to re-emit solar radiation in the near-infrared spectral region.

The NDVI is calculated from these individual measurements as follows:

$$NDVI = (NIR - Red) / (NIR + Red)$$



where red and NIR stand for the spectral reflectance measurements acquired in the red (visible) and near-infrared regions, respectively.

NDVI value varies between -1.0 and +1.0.

when you have negative values, it's highly likely that it's water. On the other hand, if you have a NDVI value close to +1, there's a high possibility that it's dense green leaves.

But when NDVI is close to zero it could be an urbanized area.



## Goals

1. Our goal is to find the amount of green cover and urban cover given a satellite image view of city.
2. We plan to do that by using the NDVI of the satellite images and get to know about the different covers.(greenery/urban).

## Results

1. Showing that the amount of green cover and urban cover in a satellite image can be found by using the NDVI index.
2. How clouds, tall structures/buildings and noise affect the calculation and how to get the correct result even when we have these problems.

## Team members and division of work

Understand the papers on measuring vegetation from satellite imaging with NDVI combinely and divide the remaining work as follows:

1. Anirudh Reddy will work on achieving the result(1) and look more into how precisely the indexing can be used to differentiate between different vegetation as there is no proper boundary saying above this index, it is water etc.
2. Nikhilendra Atheti will work on achieving the result(2) and read more on how to identify the green cover and urban cover when there is clouds i.e, total information is not available.

## Milestones

### I. Understanding and implementing the NDVI on the satellite images Classifying different covers (greenery/urban) based on the indexing

Understand the concept thoroughly and complete understanding few papers on it and start implementing it to reach the first goal and show the results.

**Complete By:** Before the first Presentation of the project (First Evaluation)

### II. Implement the same on satellite images where there is noise (clouds etc)

**Complete By:** Before the first Presentation of the project (First Evaluation)

## References:

1. <http://adsabs.harvard.edu/abs/2013AGUFMIN24B..02B>
2. <https://gisgeography.com/ndvi-normalized-difference-vegetation-index/>
3. <https://www.gislounge.com/measuring-vegetation-satellite-imagery-ndvi/>