A grayscale satellite image of a city area. Numerous rectangular and irregular shapes representing buildings and structures are highlighted in a bright green color. These green shapes are scattered across the image, with a higher concentration in the upper right and lower right areas. Blue lines are drawn over the image, outlining specific regions or boundaries. A red line forms a circular shape in the lower right quadrant, possibly indicating a roundabout or a specific zone. The background is a grayscale aerial view of the city, showing roads, vegetation, and other urban features.

Masking changes in land cover in multi-resolution satellite images

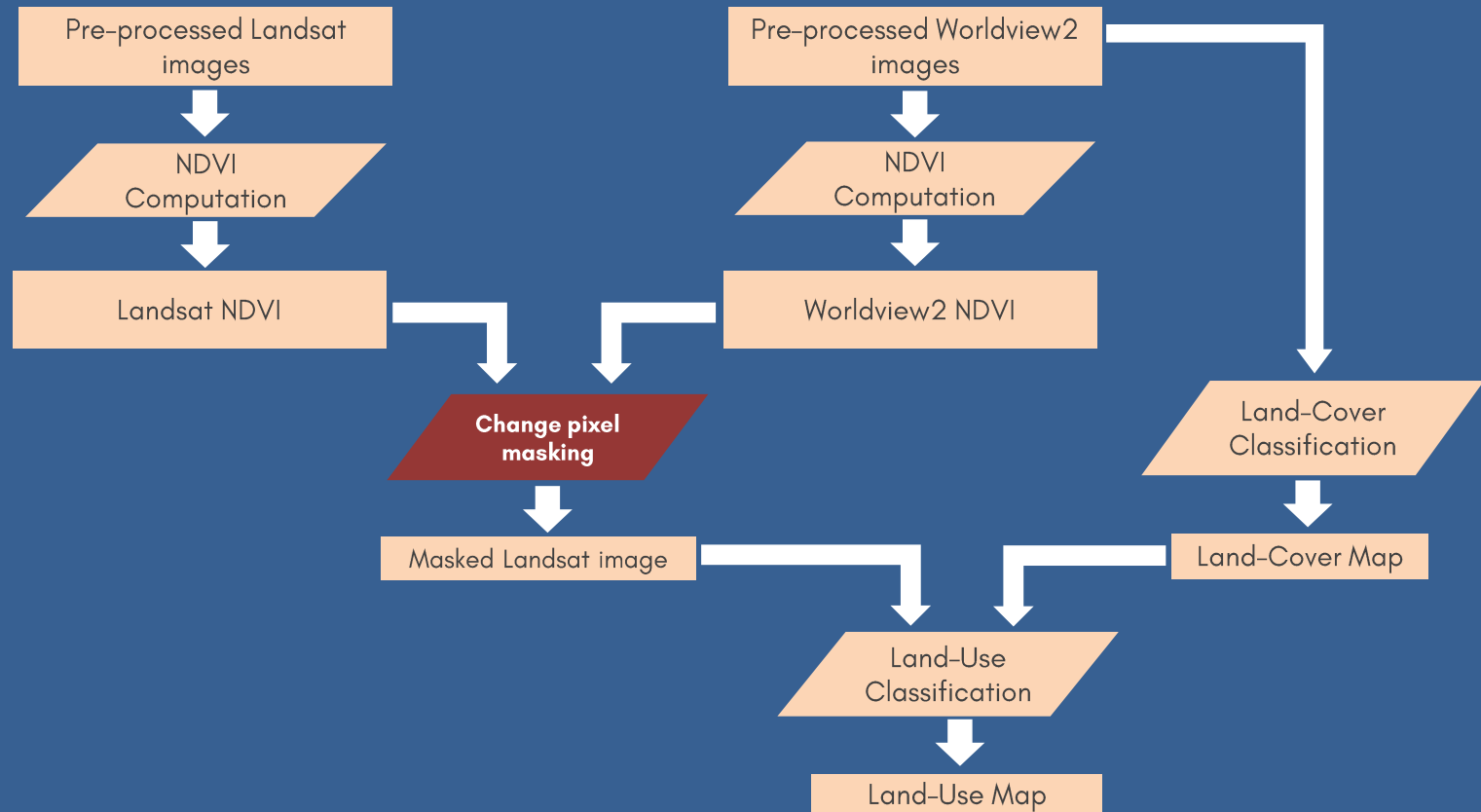
Presenter: **Gab Torres**

Github id: <https://github.com/tropicalmentat>

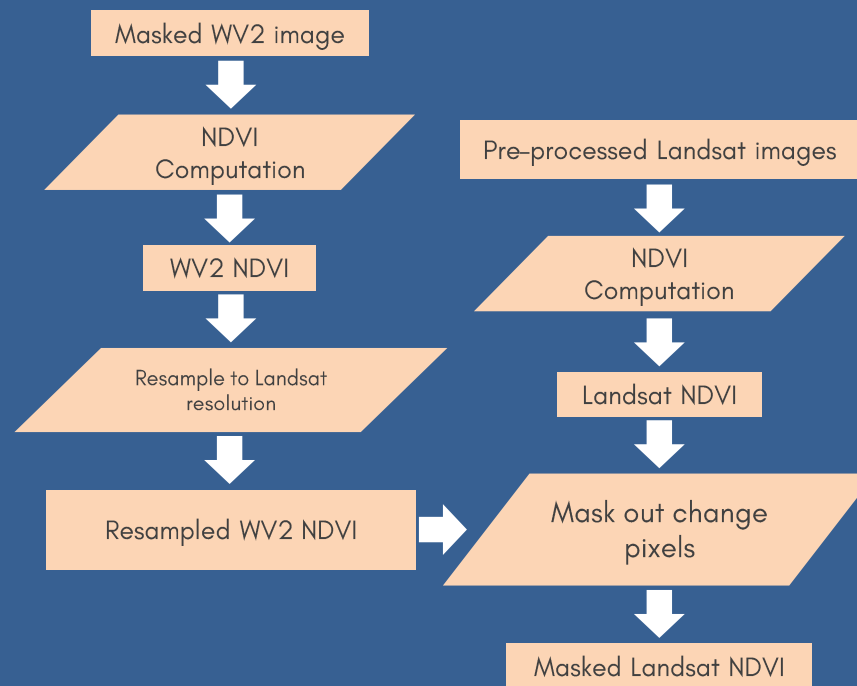
Master of Science in Geography | UP Diliman

Remote Sensing and Geographic Information Systems
Technologist | Manila Observatory, Ateneo de Manila

General Work-Flow



NDVI Computation and Change Pixel Masking



NDVI:
Normalized
Difference
Vegetation
Index

Inputs

Worldview2

Panchromatic resolution: 0.46m

4 standard multispectral bands (red, green, blue, near infrared)

Landsat 8

Multispectral resolution: 30m

8 multispectral bands

For NDVI computation, I am only interested in bands 3 and 4 of both sensors!

Worldview2





The image is a false-color satellite photograph, likely from Landsat 8, showing a landscape with a grid overlay. The grid consists of small squares in various shades of purple, blue, green, and brown. Overlaid on this grid are several colored polygons: a large yellow polygon in the upper left, a smaller yellow polygon in the lower left, and several green polygons of various shapes and sizes scattered across the image. A red line runs diagonally from the top left towards the middle right. The text 'Landsat 8' is written in white on a black rectangular background in the upper left corner.

Landsat 8

Where are the changes in land cover between these two images?

Modules used:

GDAL – **G**eospatial **D**ata **A**bstraction **L**ibrary

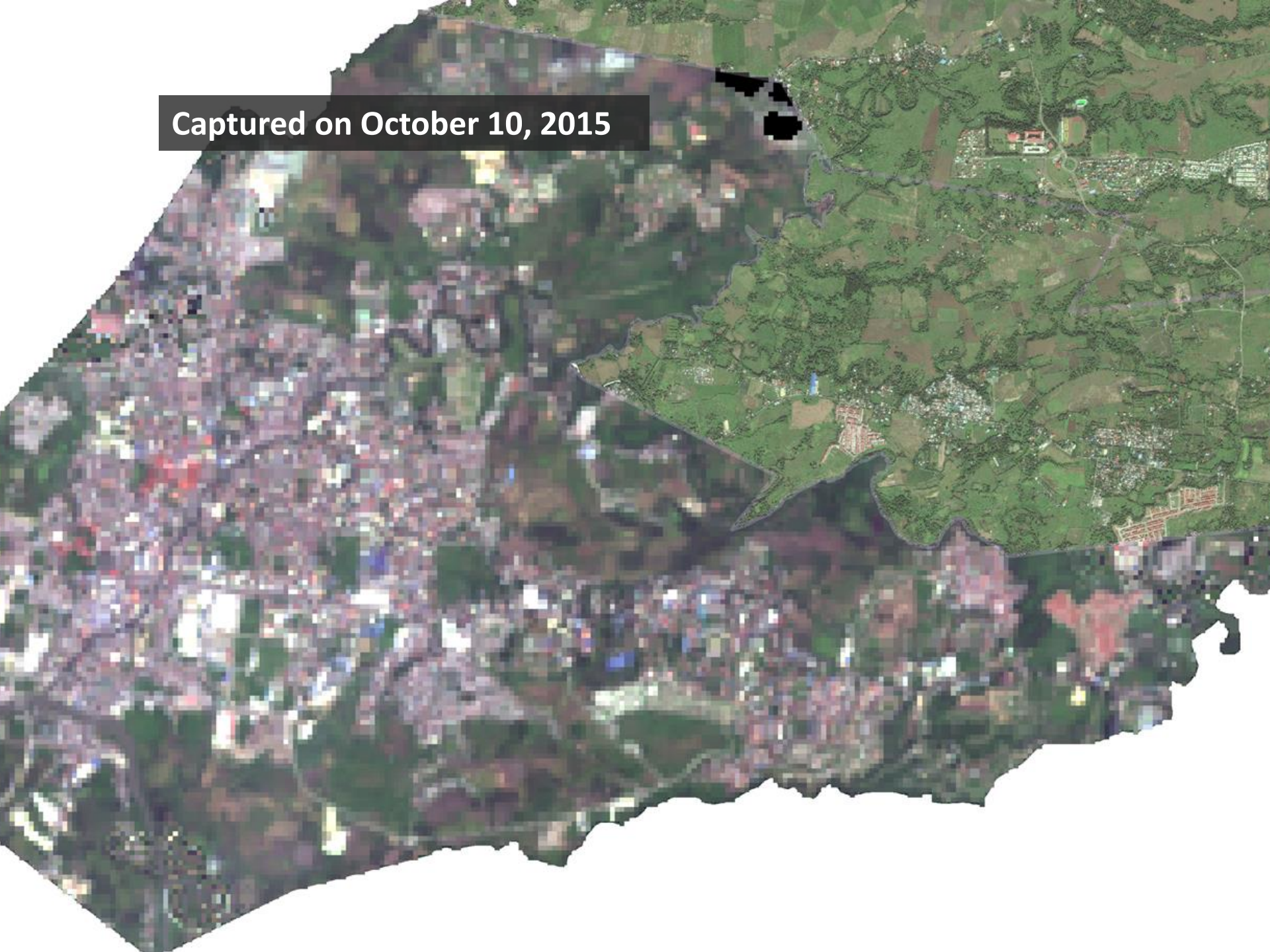
Sci-kit image – For image processing

Scipy – For linear regression

Numpy – For handling image-arrays

Random – For random sampling of pixels

Captured on October 10, 2015



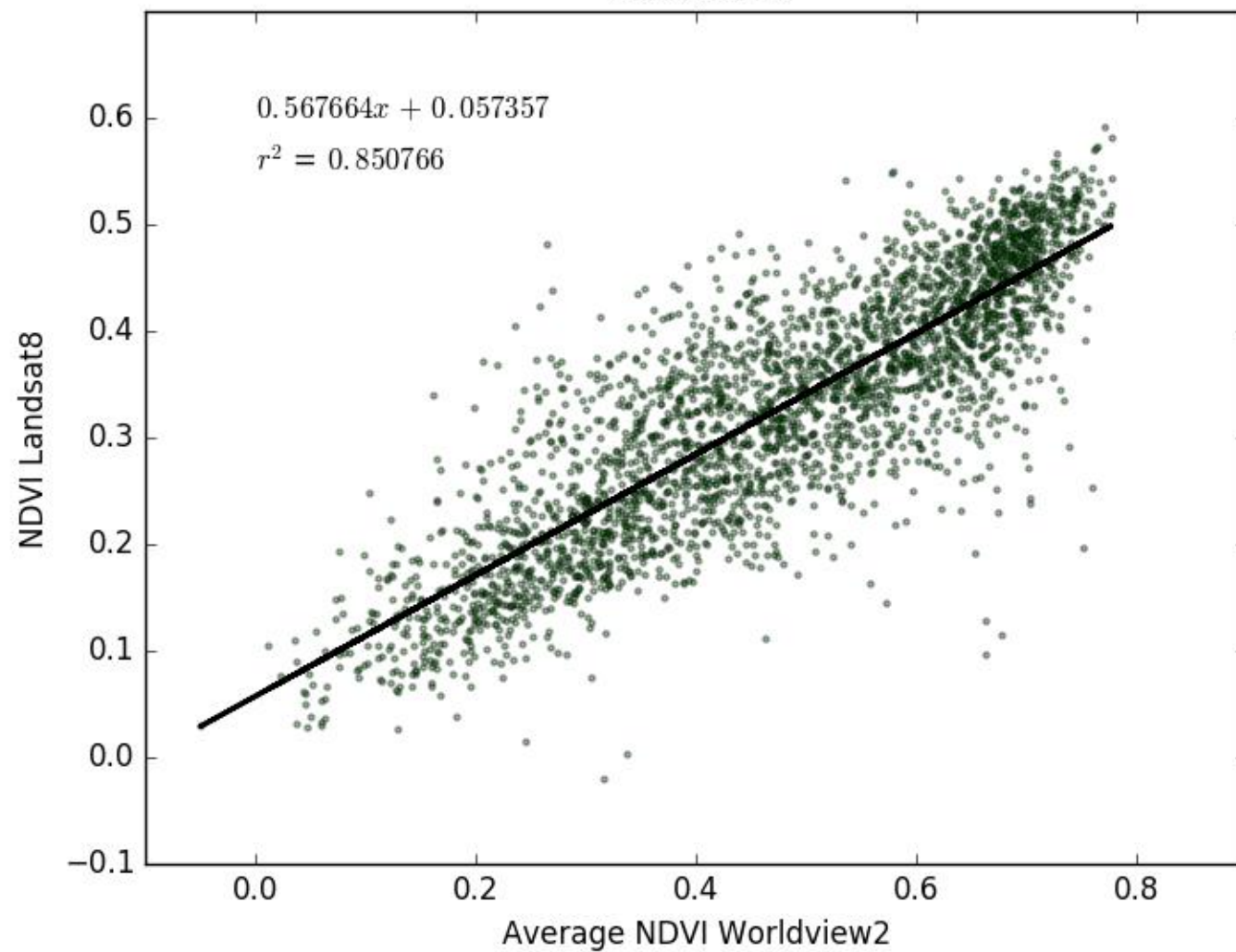
Captured on December 24,
2015



Pixels in multi-resolution images are correlated.

Can be modelled using linear regression.

Iteration 3







A satellite map of a coastal city, likely in Brazil, showing a mix of urban development and surrounding agricultural land. A white line indicates a coastline or a major water body. Several yellow rectangular boxes are overlaid on the map, highlighting specific areas of interest. These boxes are located in the upper left, upper center, middle center, bottom left, and bottom center. The text 'Changes in land cover occurred in agricultural areas' is overlaid on the top right, and 'Also detected urban expansion!' is overlaid on the middle right. A repository link is provided at the bottom right.

Changes in land cover occurred in agricultural areas

Also detected urban expansion!

Repository link:
https://github.com/tropicalmentat/the-sis-project-scripts/blob/master/mask-change-pixels/temporal_filter.py



A satellite map of a coastal region, likely in the United States, showing a mix of urban, suburban, and rural areas. A prominent white line, possibly a road or a boundary, runs diagonally across the left side of the map. The map is overlaid with a semi-transparent dark green rectangle containing the text 'THANK YOU! 😊'.

THANK YOU! 😊