

CHALLENGE SETTER GREEN POWER RANGERS



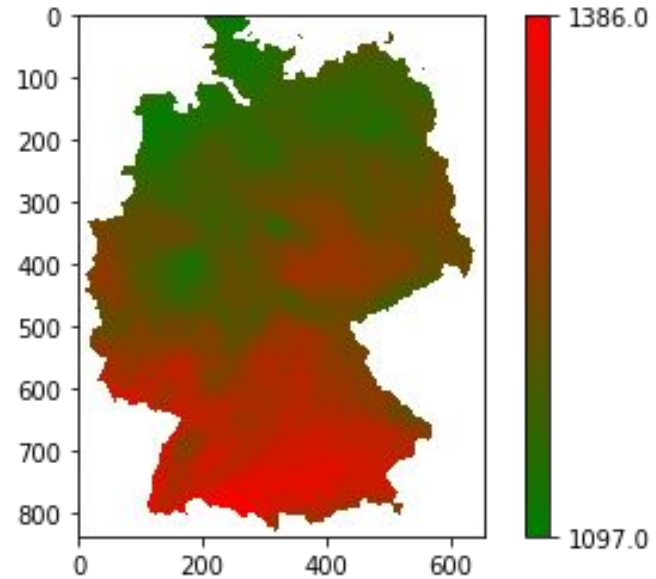
PROBLEM

Problem statement:

- ✓ Solar panel distribution right now is not optimal (first come, first serve);
- ✓ How to identify efficient areas or regions to subsidize solar panels

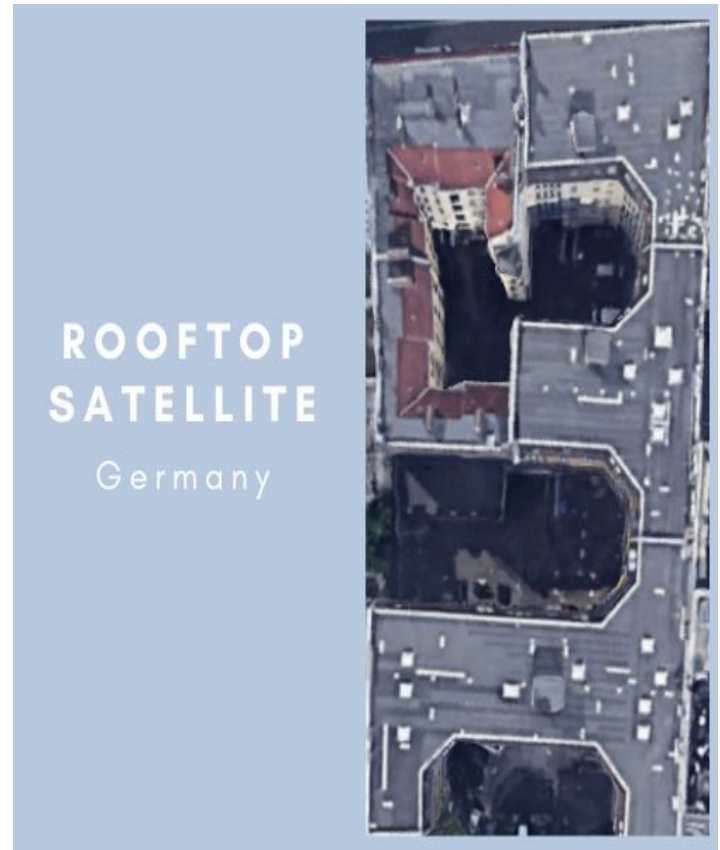
Approach: Finding Locations considering radiation

- ✓ Identify regions with the greatest solar radiation, as these offer the greatest potential for the use of solar panels.
- ✓ Using the radiation dataset from the German Weather Institution.
- ✓ High values and thus increased potential in the south of the country



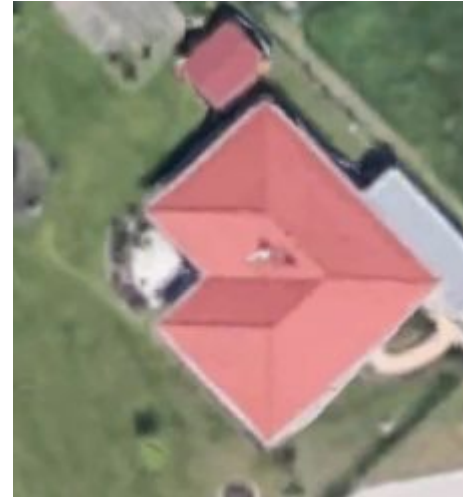
Approach: Finding Locations

- ✓ In cities? - Disadvantages:
 - Lack of available rooftop spaces
 - Pollution
 - Many house owners / inhabitants
 - Expensive installation

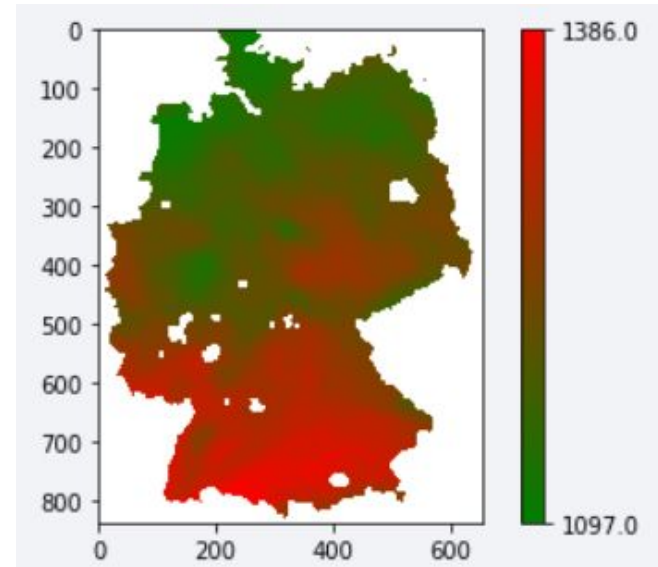
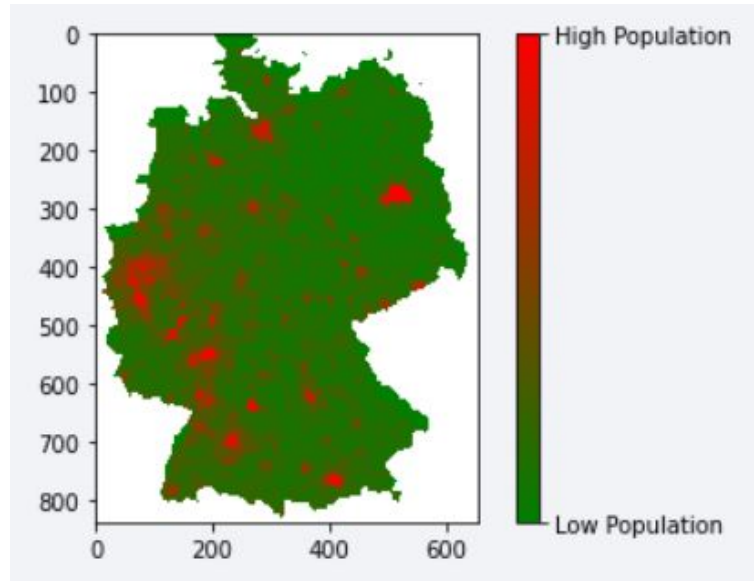


Approach: Finding Locations

- ✓ In lower populated areas:
 - Generally more roof space
 - Less pollution
 - Single owner
 - Cheaper installation



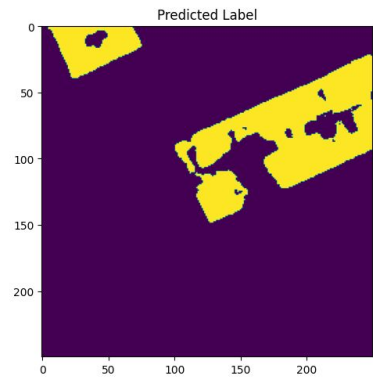
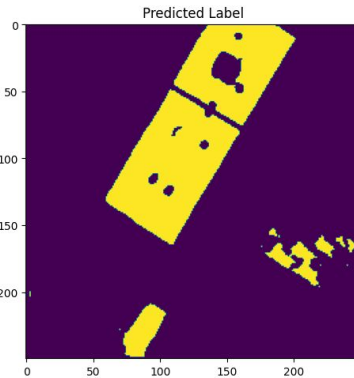
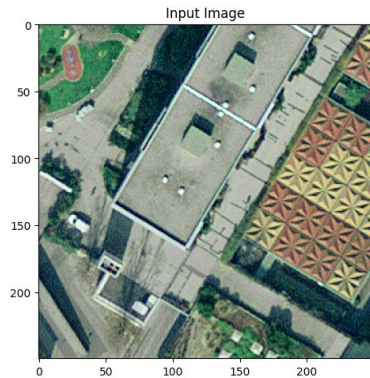
A look at the population map:



→ Search best suited locations

Detection of rooftops through Google Satellite images

- Get images with Google Static Maps API
- Identify areas with many roofs using pre-trained CNN



ROADMAP

Collect more data to further train
an improve our model

1

Finding the best areas,
using this score

3

Create a score based on population, radiation and
rooftop-areas for efficient evaluation of areas

2

Approach local
Lawmakers

6

An aerial photograph of a modern architectural complex. The central feature is a large, rectangular green roof with rows of plants. To the left, there's a curved, white-walled structure, possibly a pool or a large planter. The building has multiple levels with balconies and a mix of greenery and paved areas. The sky is blue with white clouds, and there are some stylized, colorful smoke or cloud effects around the building.

TECHNICAL IMPLEMENTATION

Source

✓ Geofabrik OpenStreetMap data

- ♦ <https://download.geofabrik.de/europe/germany.htm>
- ♦ <https://download.geofabrik.de/europe/germany/bremen.html>

✓ Germany: High Resolution Population Density Maps + Demographic Estimates

- ♦ <https://data.humdata.org/dataset/germany-high-resolution-population-density-maps-demographic-estimates>

✓ German Weather Institution Gridded annual sum of incoming shortwave radiation (global radiation) on the horizontal plain for Germany based on ground and satellite measurements

- ♦ https://opendata.dwd.de/climate_environment/CDC/grids_germany/annual/radiation_global/grids_germany_annual_radiation_global_2022.zip

✓ Google Static Maps API

- ♦ <https://developers.google.com/maps/documentation/maps-static/start?hl=de>

✓ Pre-trained model: Github riccardocadei photovoltaic-detection

- ♦ <https://github.com/riccardocadei/photovoltaic-detection>

THANKS!

Any questions?

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