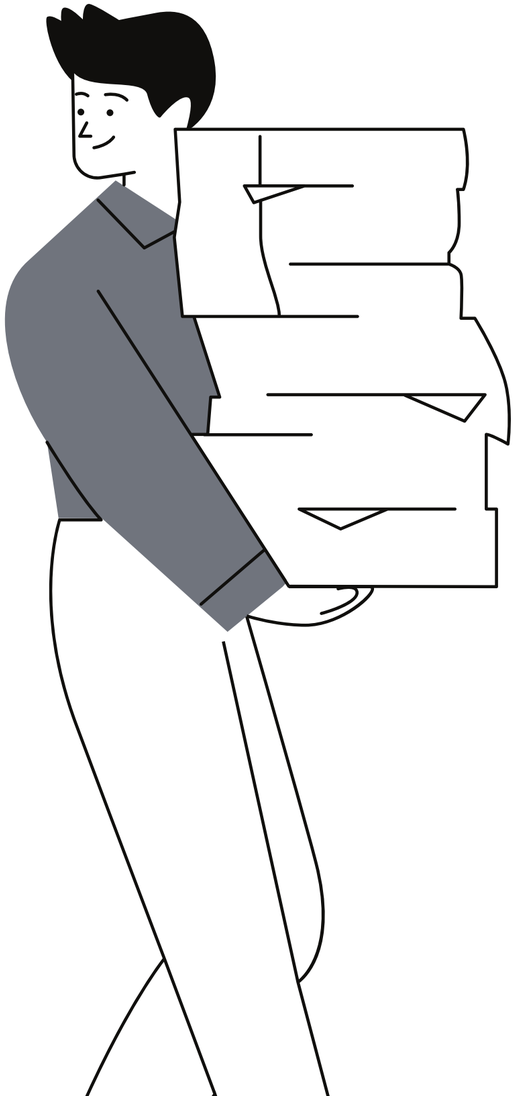
solarCity

Your roof can help the environment



Team : Phoenix

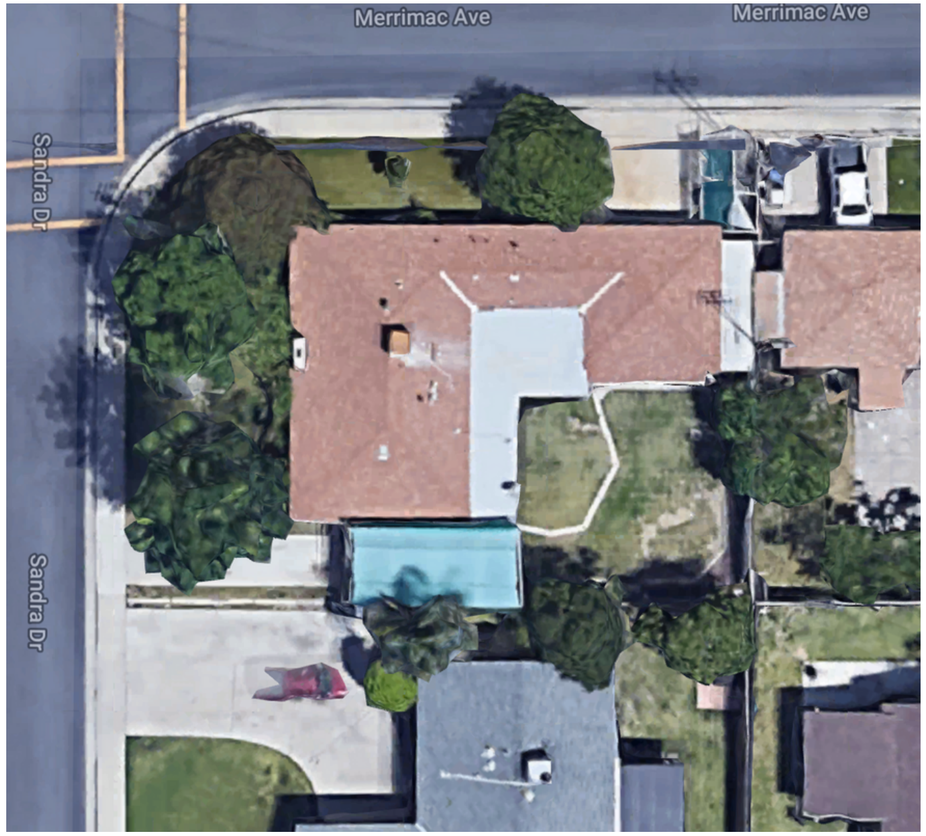
We will provide you with the details of the :

1. Rooftop Area
2. Solar Intensity value
3. Number of Solar Panels required to cover the rooftop
4. Cost of installment
5. Power Generation(KWH)

What we are doing?

1. Take Satellite Imagery using Google Maps/OpenStreetMaps
2. Using Machine Learning(edge detection), estimate the area of rooftop of buildings.
3. With a certain place, associate its solar radiation intensity value.
4. Convert the data to the amount of energy generated yearly if the roof had solar panels.
5. Make a global impact

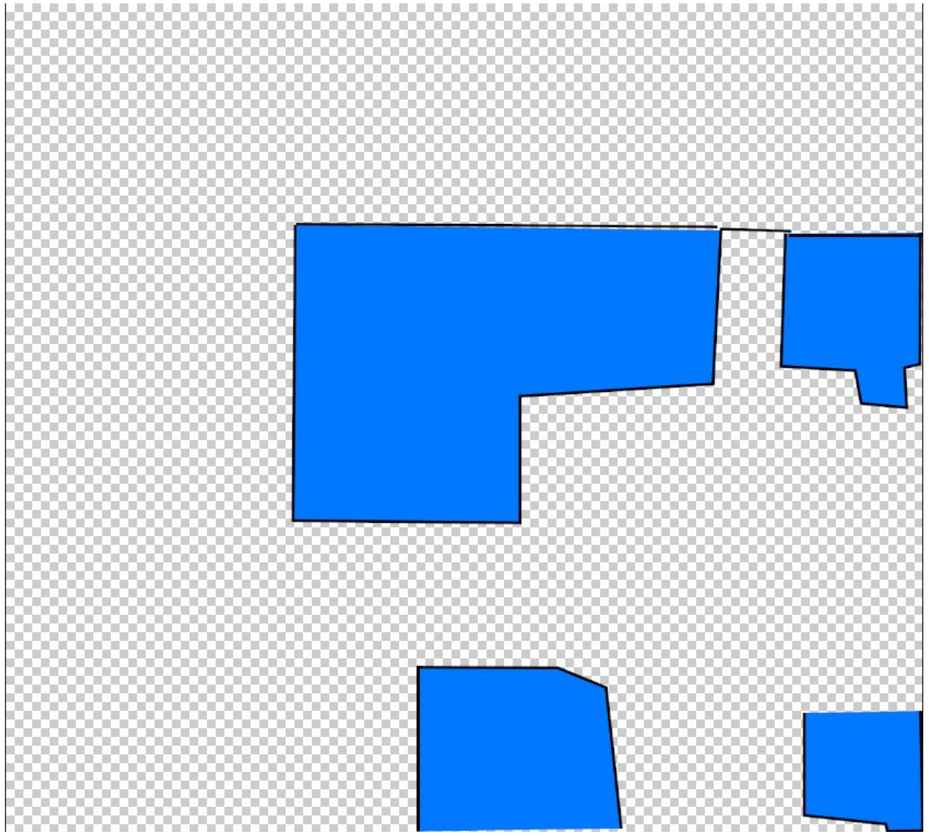
Snapshots



Using Google Maps API, we get the rooftop snapshot

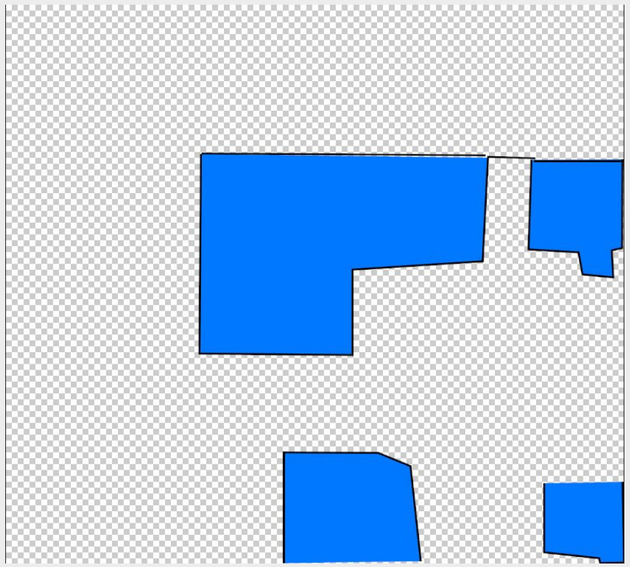
Pass it to our ML model

With the help of various filters and image processing algorithms



Rooftop is identified and shaded.

Pixels to Area using Google Maps model



Shaded rooftop region

Let's say
480 meter^2
is the area.

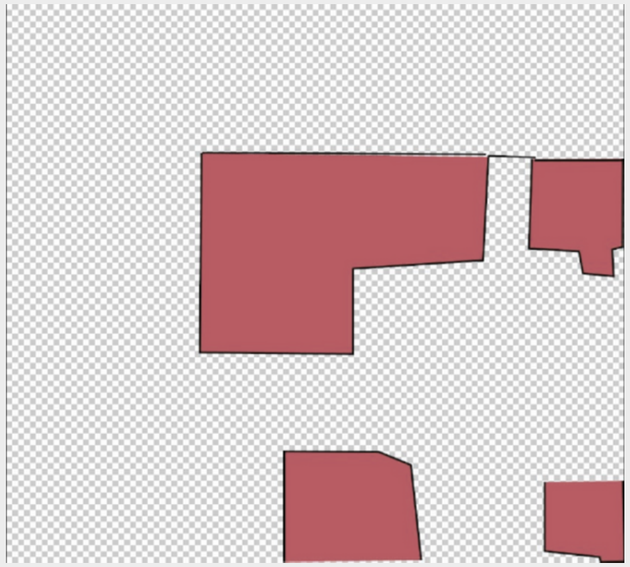
Estimate the number of solar panels required to cover the rooftop.

Estimate the cost of solar panels and the power generation per year in KWH.

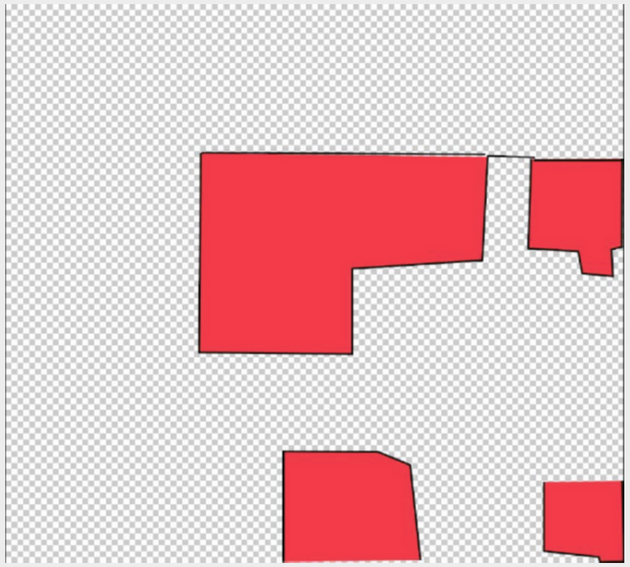
Solar Radiation Intensity Classifier

Label the roofs with varying shades based on the solar potential generated from the radiation intensity database.

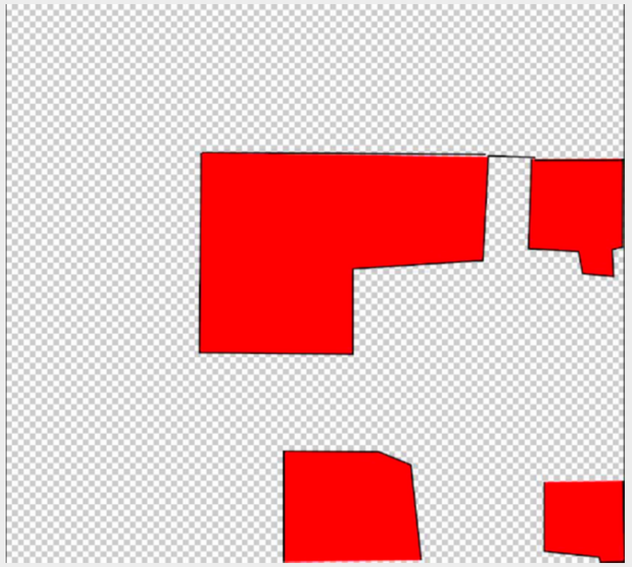
Using a database of SOLAR RADIATION INTENSITY we show varying shades of colour on the roof.



Less saturated colour-Lower power generation

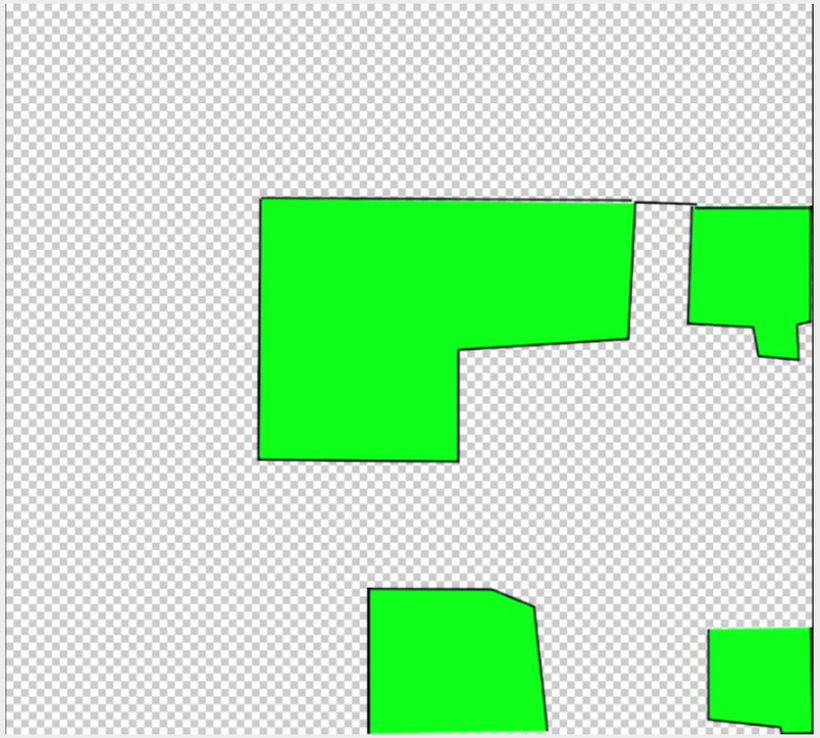


A bit more saturated colour-Average power generation

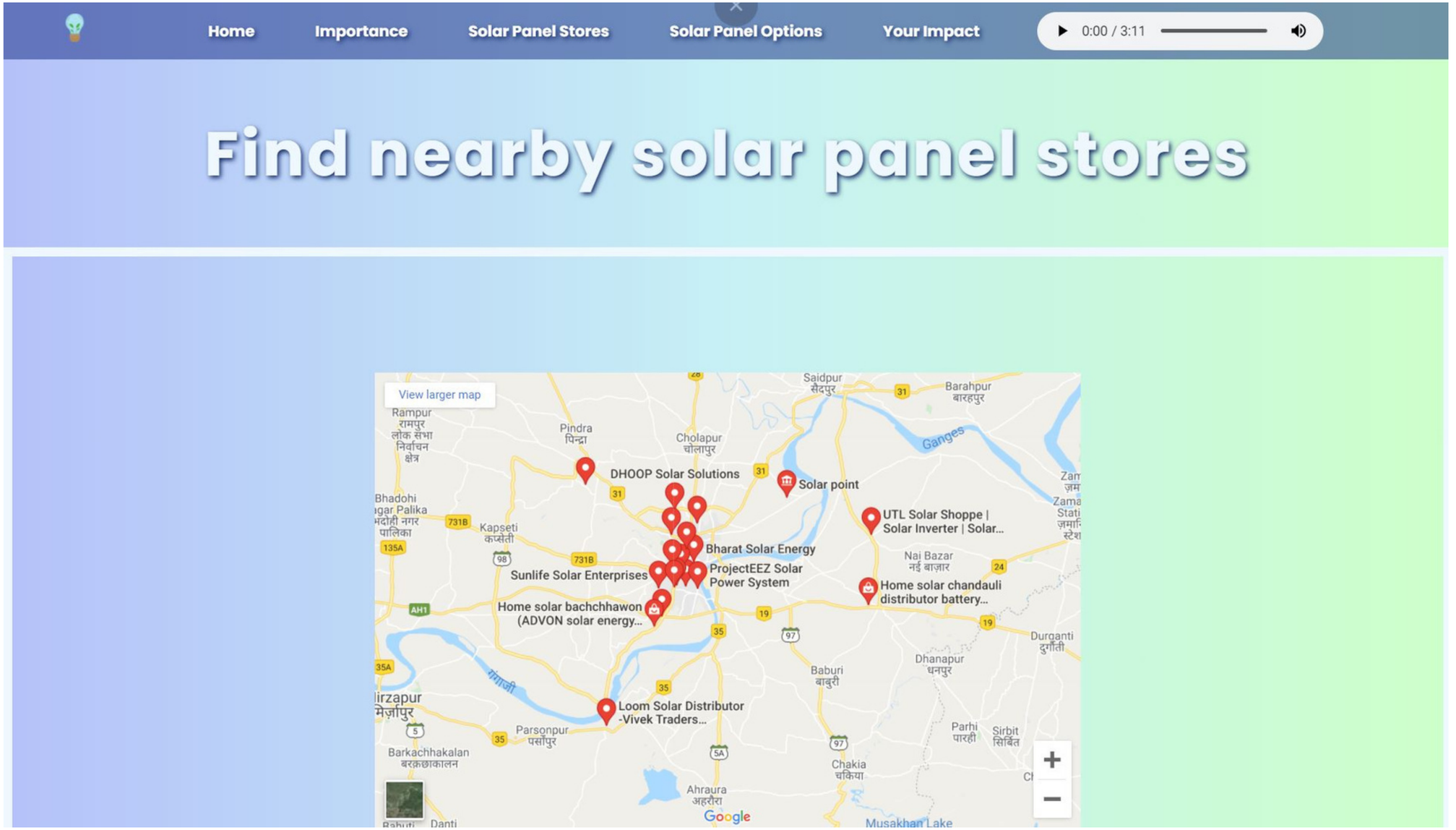


Highly saturated colour-High power generation

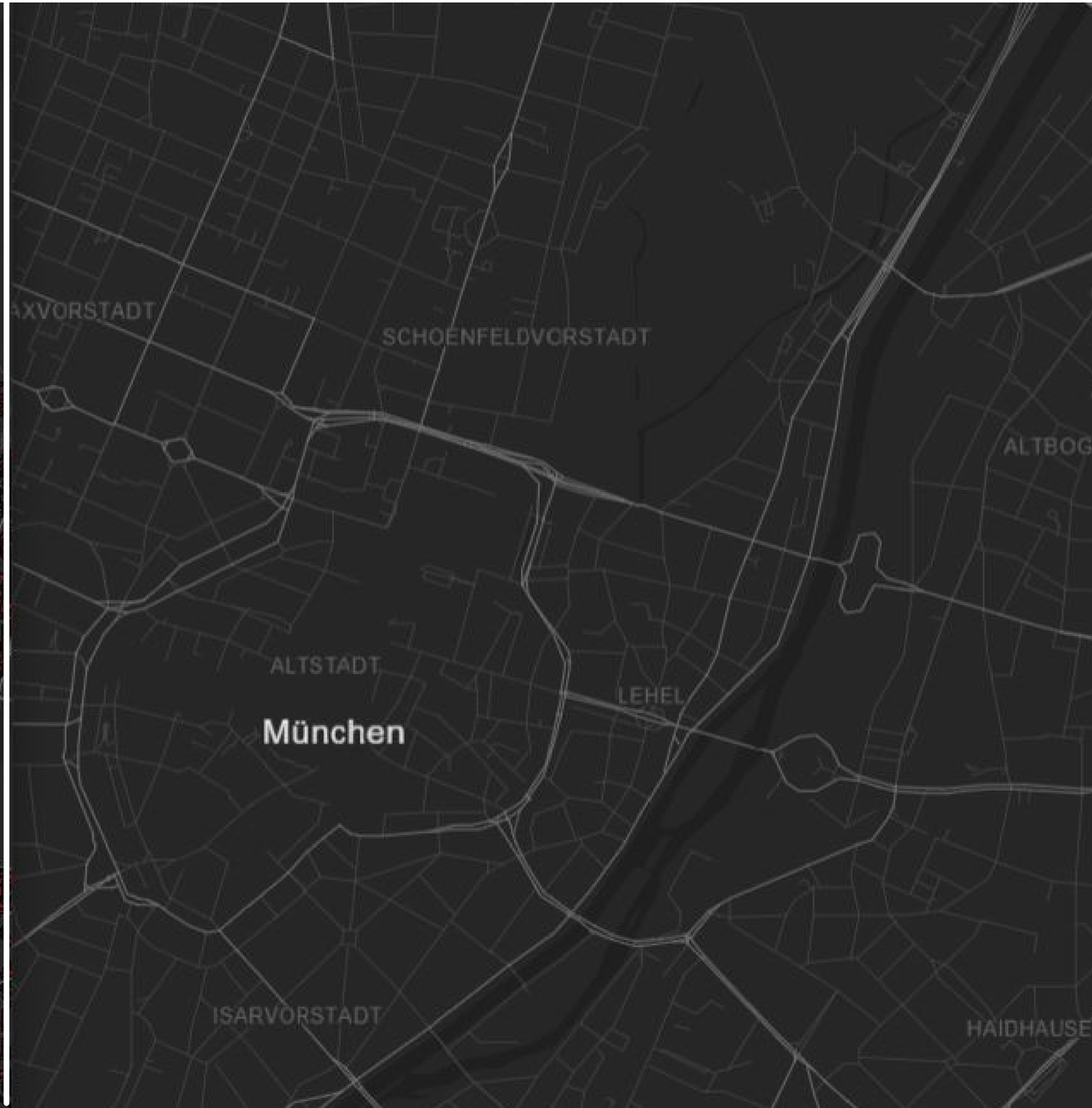
If the roof top is already having solar panels, it will be labelled green



Additional Features



Expected Outcomes



Expected Outcomes

Infinite but lets quantify it.

Your roof, the yardstick measurement of your potential in saving the environment

1. To know the Solar power generation potential of a certain place.
2. To know the solar radiation and based on the rooftop area and the solar radiation intensity, find the approximate power generation in kWH
3. To help the people make decisive plans on shifting to solar panels and renewable energy in general.
4. To estimate the time in which you'd get a return on your investments just by covering your rooftop, and to amount the courtesy you did to the environment.

Team MONTEROXAIRMAX

Tech Stack and Division of work

Arun

Machine Learning/Backend

Studying the images from google maps, using various ML models, open CV filters

Studying the Solar Radiation Intensity data and associating that data with a certain place.

Working on Backend APIs.

Saniya

Design/Photoshopped Illustrations/FrontEnd Design

Trying to give a new look to the MAPs and to fill colours on the roofs with a layered model.

Trying to use dark theme on maps.

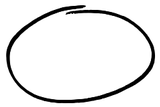
Lokesh

Backend

The Backend Architecture that can integrate the Machine Learning predictions and can view them on the website.

OSM to GeoJSON

To feed the solar radiation data and get a labelled map with varying contours and shades.



Tech Stack

ML:

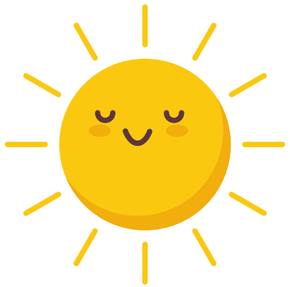
OpenCV
SKLearn-Images
PyLab
Neural Nets on Radiation values

FrontEnd:

Studio Here design

Backend

Flask
Google Maps Static API and Open Street Maps API
Google Cloud Vision API



We're done!

Thank you !