Identifying Solar Investment Potential with Machine Learning

Buddy Bernhard
Allison Lee

December 2019

The Goal: Identifying Opportunities for Investment

Where is there unmet demand for solar in the U.S.?

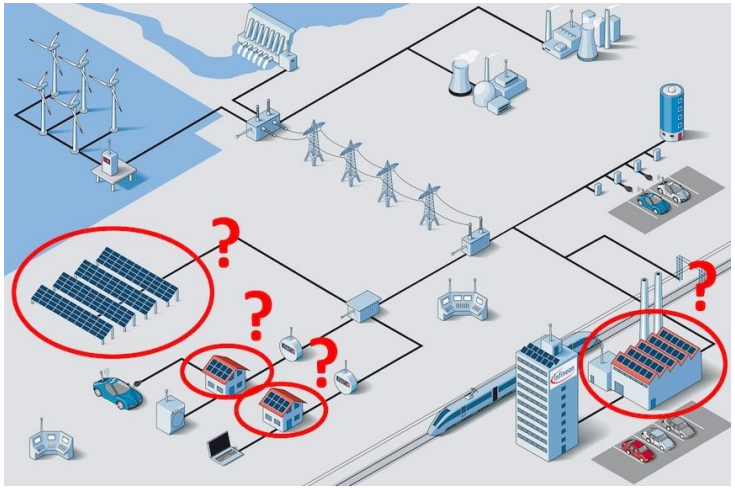
Of these areas, which are “Opportunity Zones”?

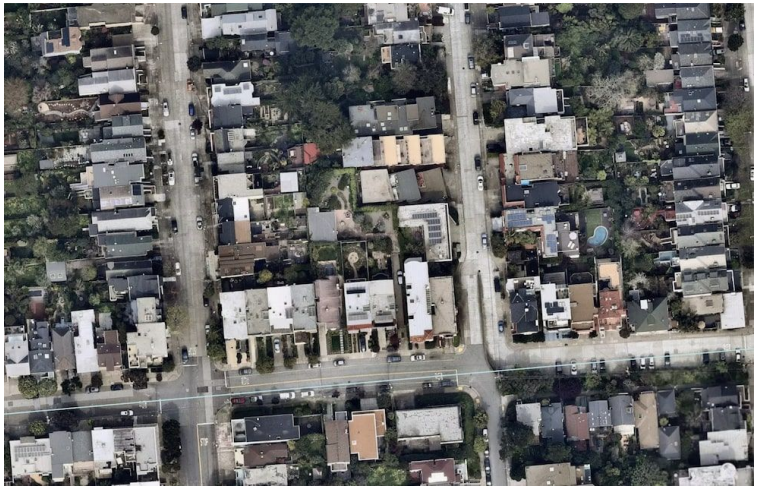
opportunity zone: “economically-distressed communities where new investments, under certain conditions, may be eligible for preferential tax treatment.”

The Data

Data from the DeepSolar Project at Stanford University

DeepSolar uses satellite imagery to identify locations and sizes of solar panels in the contiguous U.S.



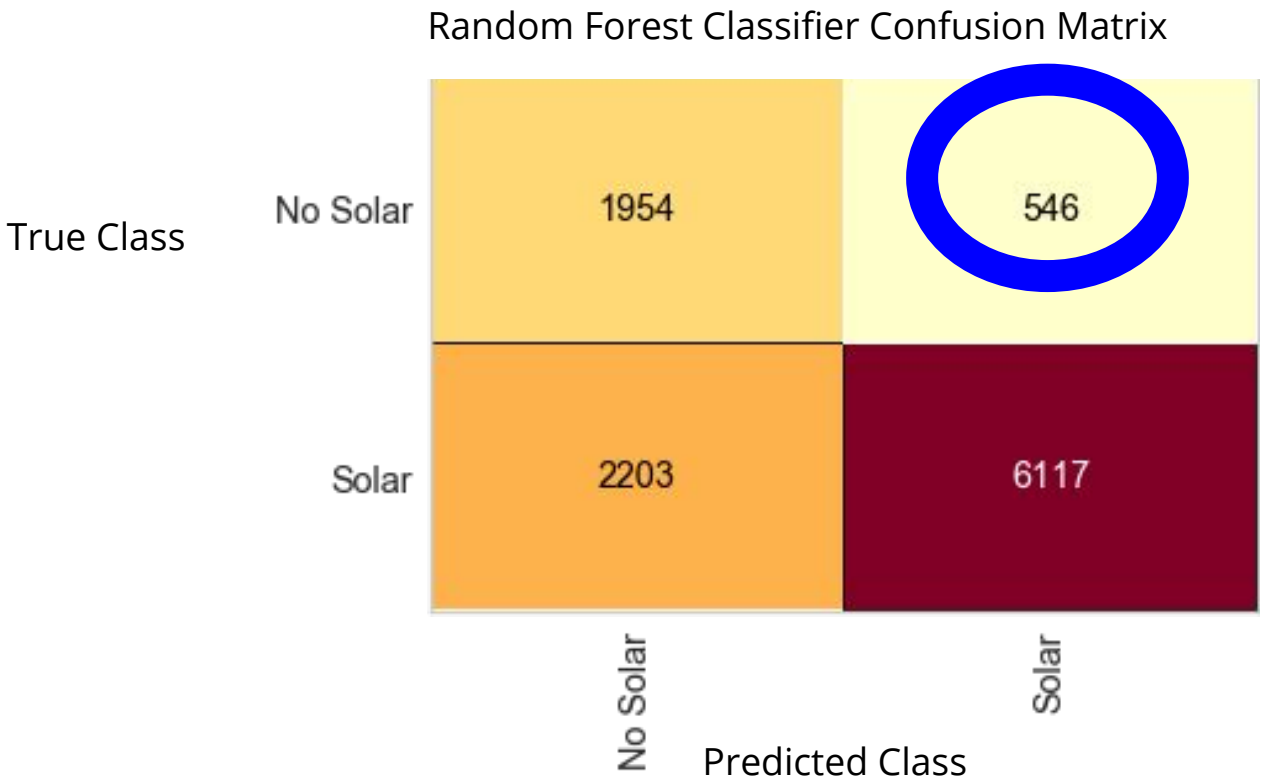


Predicting “Unmet Demand”

Find the best-performing model to predict whether or not there are solar panels in a sub-county

Identify where the model predicted solar, when in actuality there is none

Unmet Demand: Identifying Potential for Solar

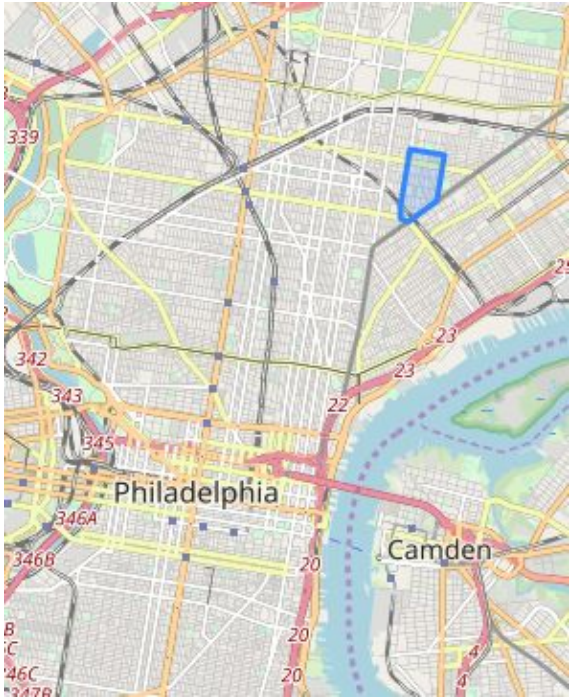


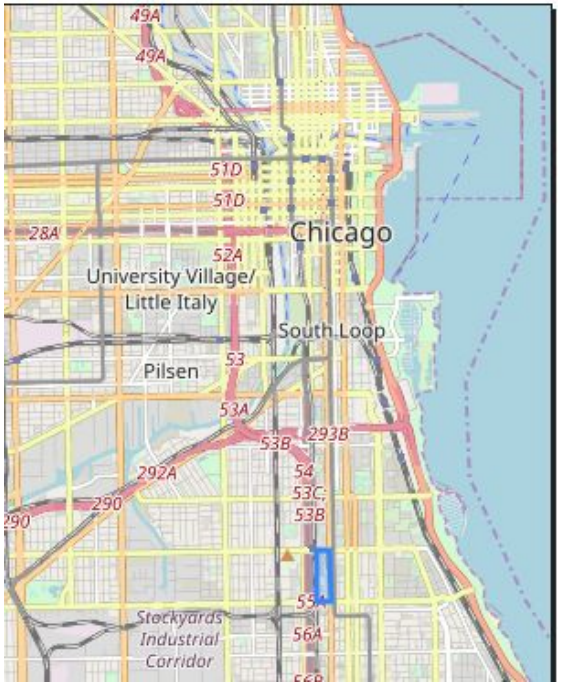
Identifying Opportunities for Investment

Investment opportunities are the intersection of:

- Sub-counties predicted to have solar, but do not
- Sub-counties that are opportunity zones

Mapping Solar Investment Potential





Findings and Recommendations

Assess opportunities for solar investment in the identified sub-counties. Identified sub-counties have both optimal conditions for solar--as suggested by our machine learning algorithm--and are opportunity zones.

Explore the use of other models to improve classification performance. Some models require more computing power and take longer to run, but may improve how well we can distinguish between sub-counties with solar and those without.

Assess whether the model can be of use on data from outside the United States. While this data is specific to sub-counties of the U.S., with available data, similar modeling approaches may be able to identify investment potential in other locations.