ML for better maps

Panel - Computer Vision and Machine Learning: from cat videos to cat modeling

developmentSEED

Geospatial data for decision making

Completeness matters

OSM, Angonche, Mozambique

Accuracy matters

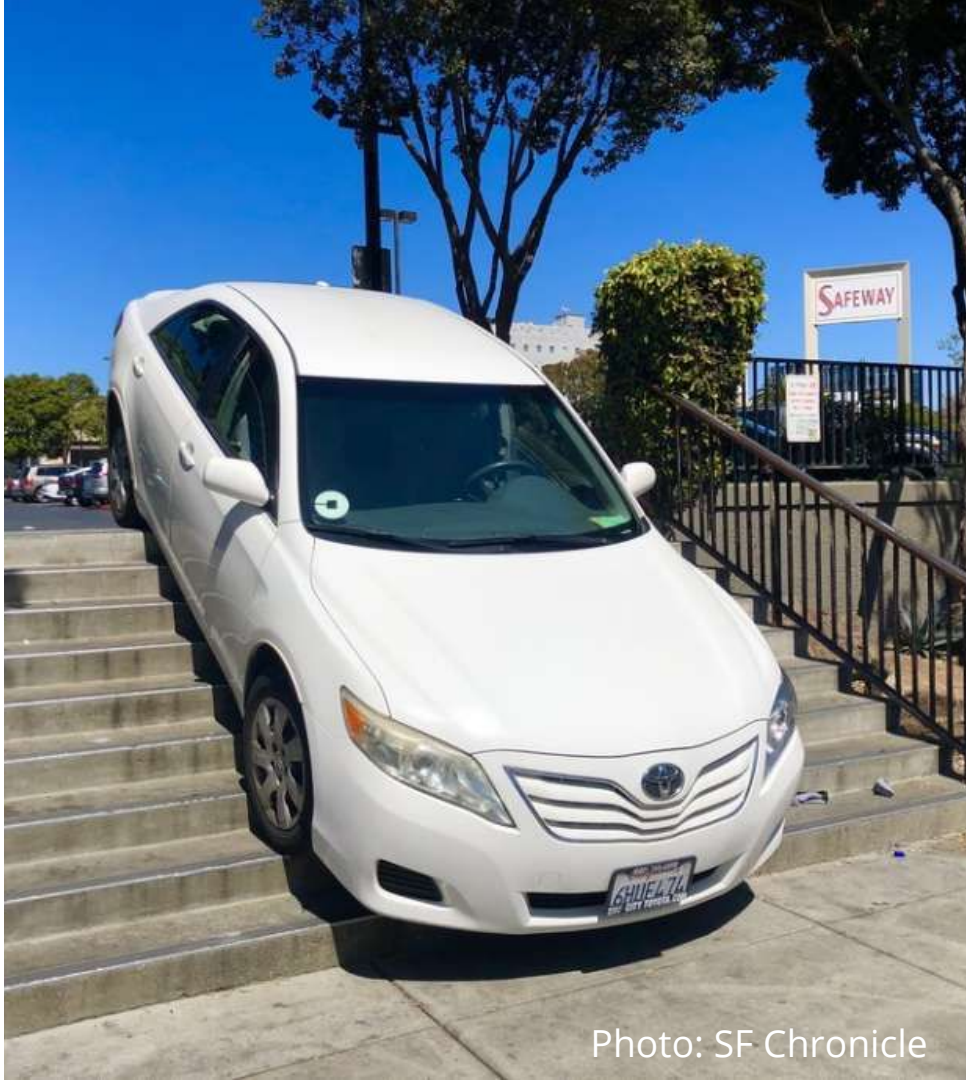
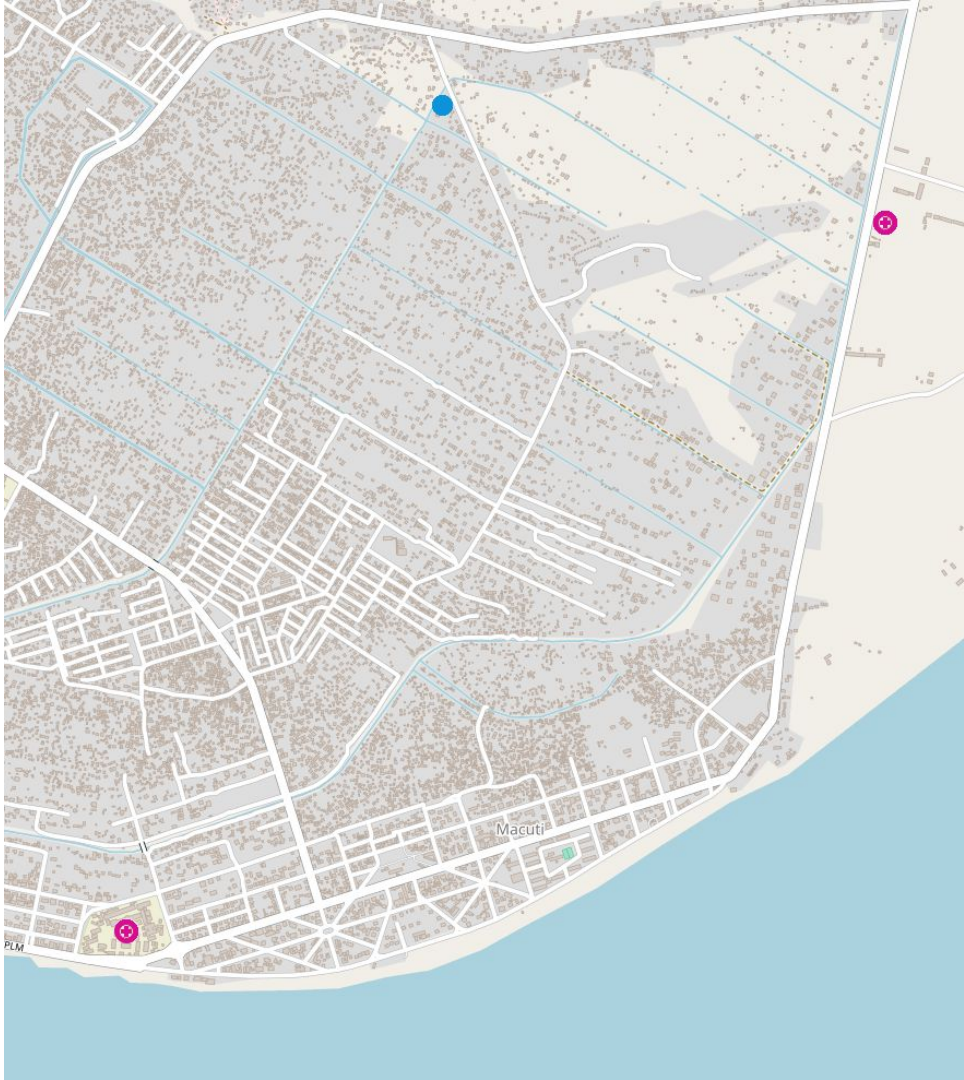


Photo: SF Chronicle

Accuracy matters



Accuracy matters

Accuracy matters

How does ML help?

It supports creators of map data (eg. OSM) to:

- Map faster and more accurately; and
- Keep the map up to date as the world around us changes

Concepts

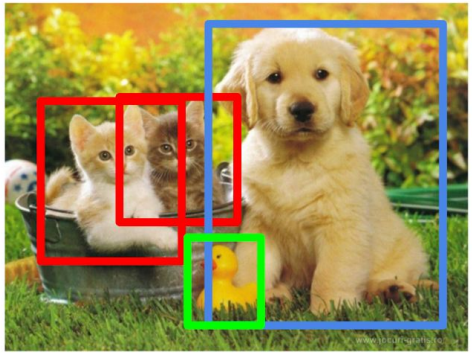
Classification

CAT

Classification + Localization

CAT

Object Detection



CAT, DOG, DUCK

Instance Segmentation

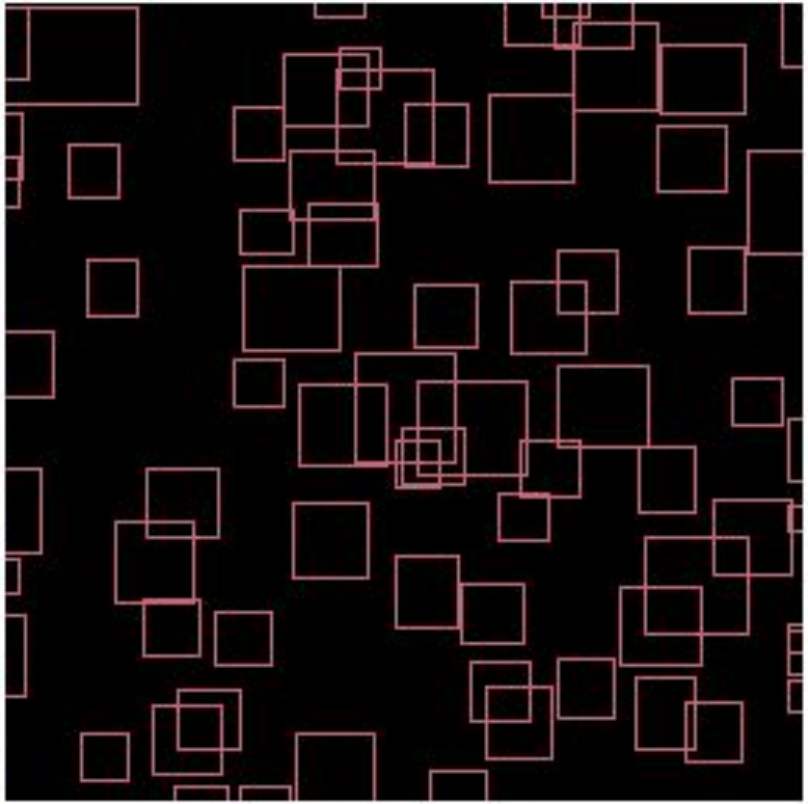
CAT, DOG, DUCK

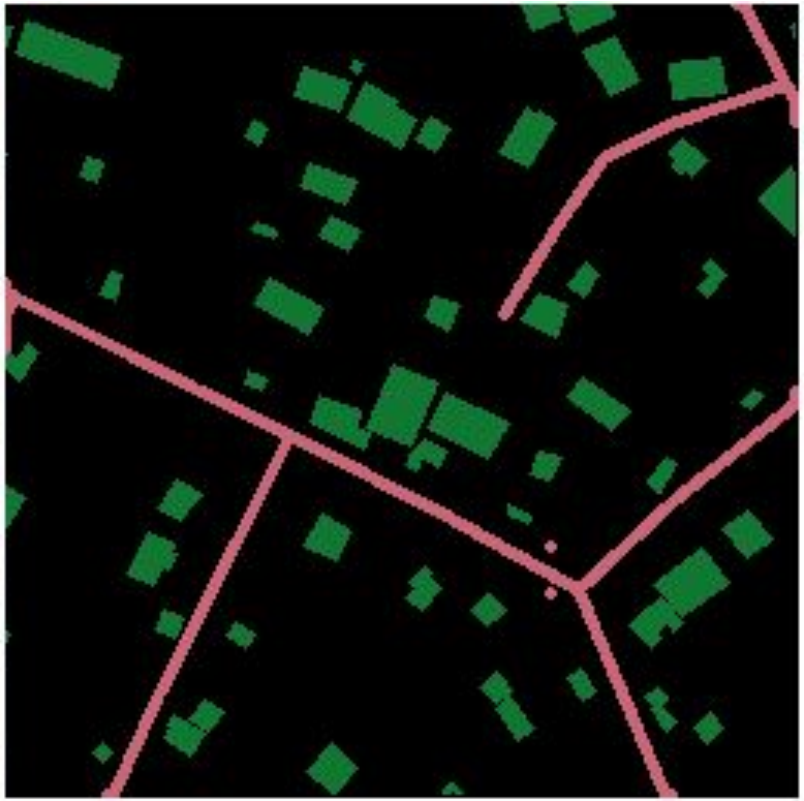
Single object

Multiple objects

http://cs224d.stanford.edu/index.html

Urban = Yes

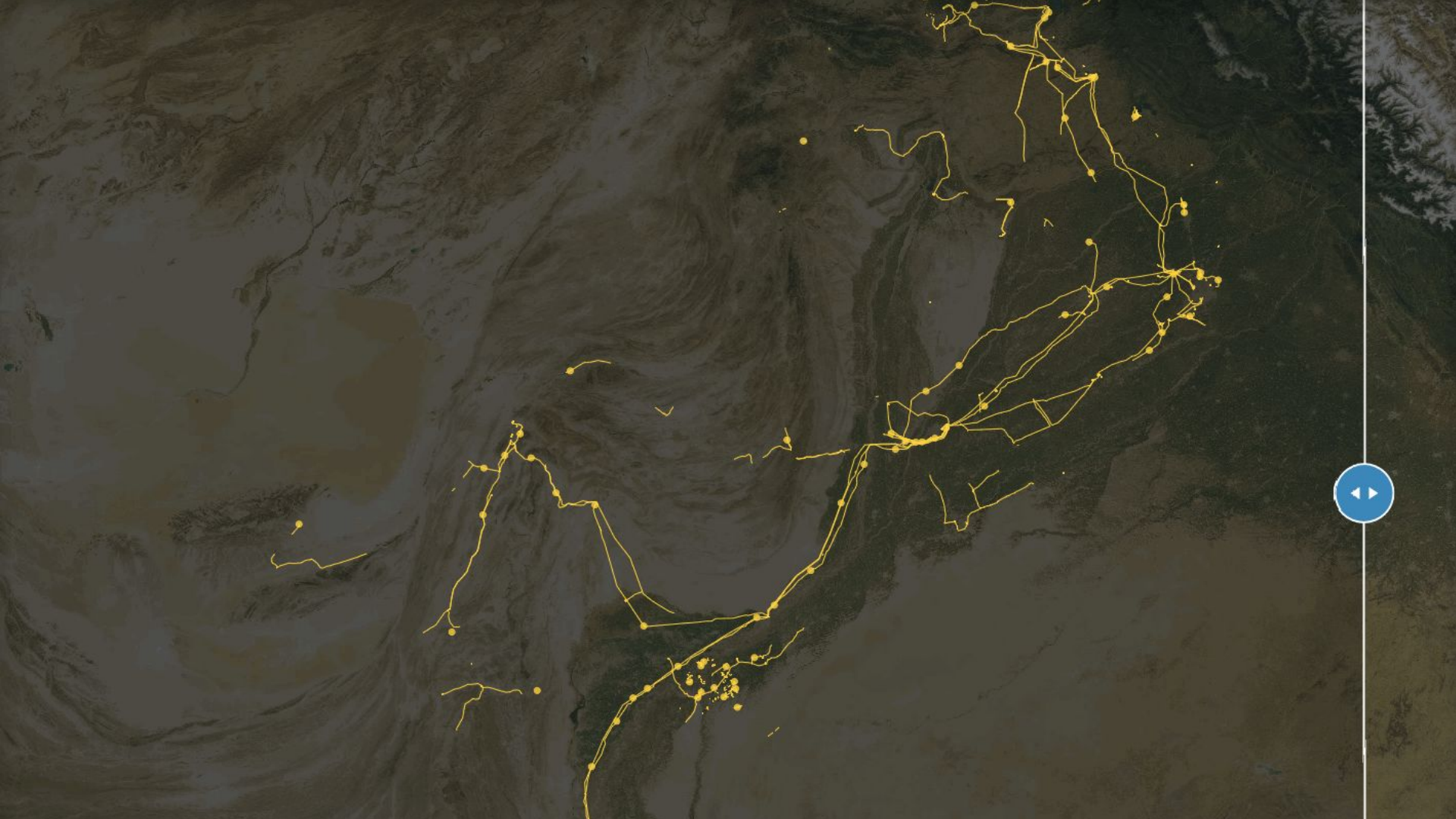




ML for mapping

Supercharging human mappers

- Target attention
- Direct mappers to the right areas
- Do the boring stuff
- Help people work faster



EDIT TIME FRAME: APR. 2010 - FEB. 2018

OSM

Last Edit: 3/4/2018

807
Building Footprints

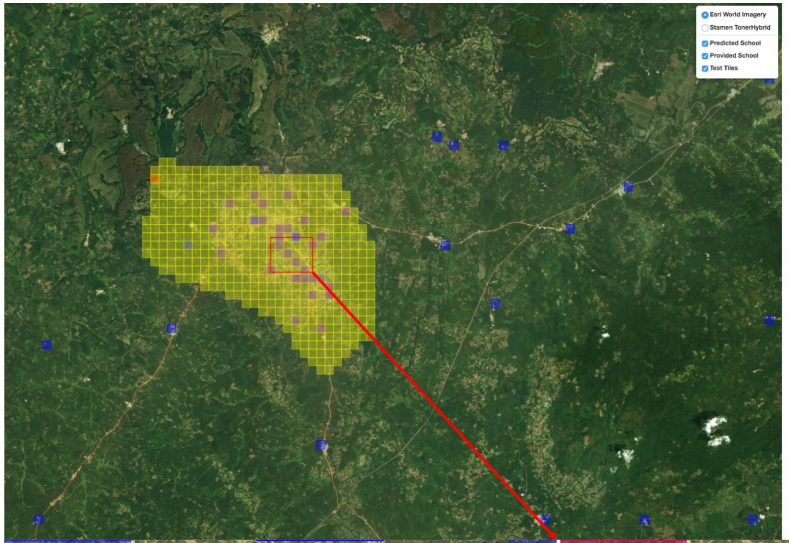
OVER THE LAST 12 MONTHS

4
Unique editors

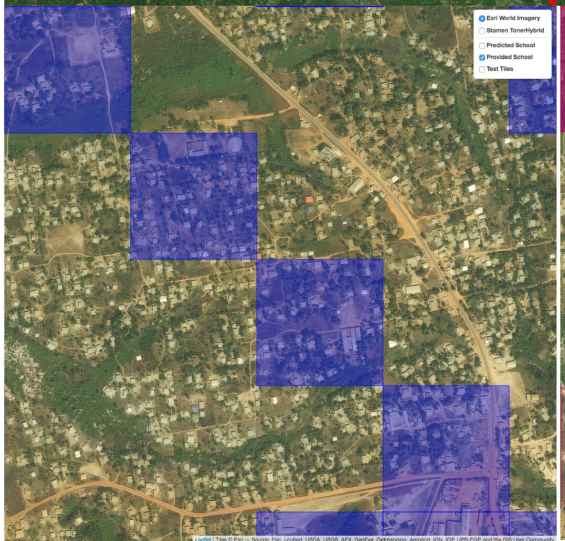
587
Footprints edited

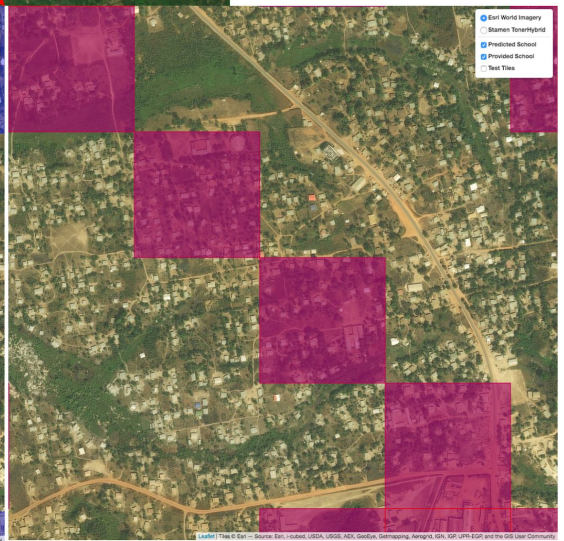
Recent OSM edits

Recent OSM editors



Sample results from Liberia – (1) yellow pixels represent the testing tiles, (2) blue pixels represent school locations, (3) pink pixels represent test tiles predicted as schools that correspond to actual school locations (true positives), (4) orange tiles represent test tiles predicted as schools that don't correspond to actual school locations (false positives).





Getting ML right

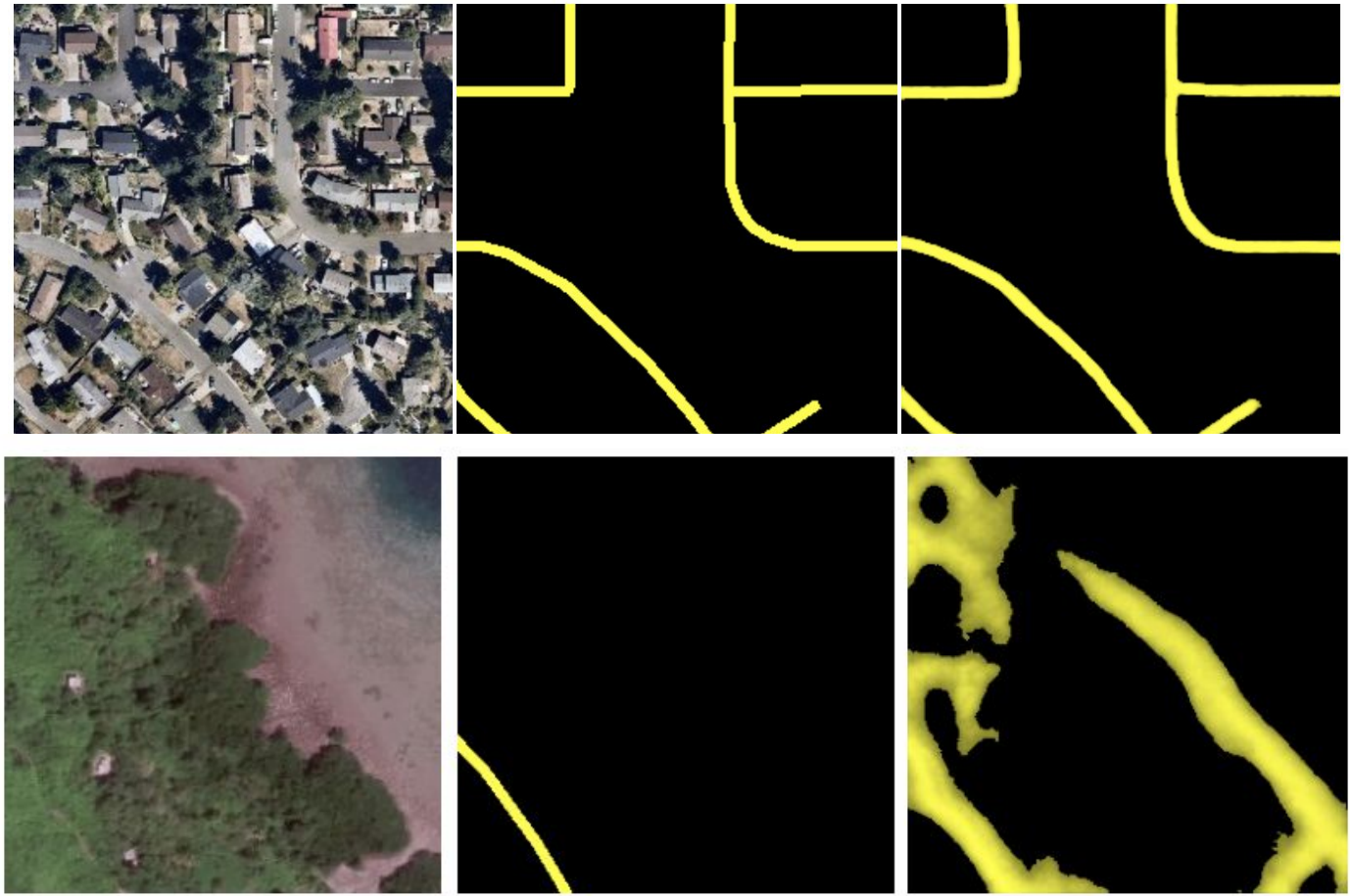
Open Machine Learning

- Open models
- Open training data
- Open toolkits - eg. Label Maker
- Open methodologies and processes - eg. HV grid report

Geodiversity

[...] examining the geo-diversity of open data sets is critical before adopting a data set for use cases in the developing world.

No Classification without Representation: Assessing Geodiversity Issues in Open Data Sets for the Developing World - *Google Brain Team*



imagery label data model prediction

Want to know more?

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