

Applying Machine Learning to Overhead Imagery: FOSS4G International 2019 Workshop



Solaris

From cosmiQworks®

Why do we need ML if we (often) have great base maps?

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Hurricane Harvey: a disaster response use case



Faster Solutions Are Required

70+

Days to Completely Map

5,300+

Volunteer Mappers

950,000

Building Labels

30,000

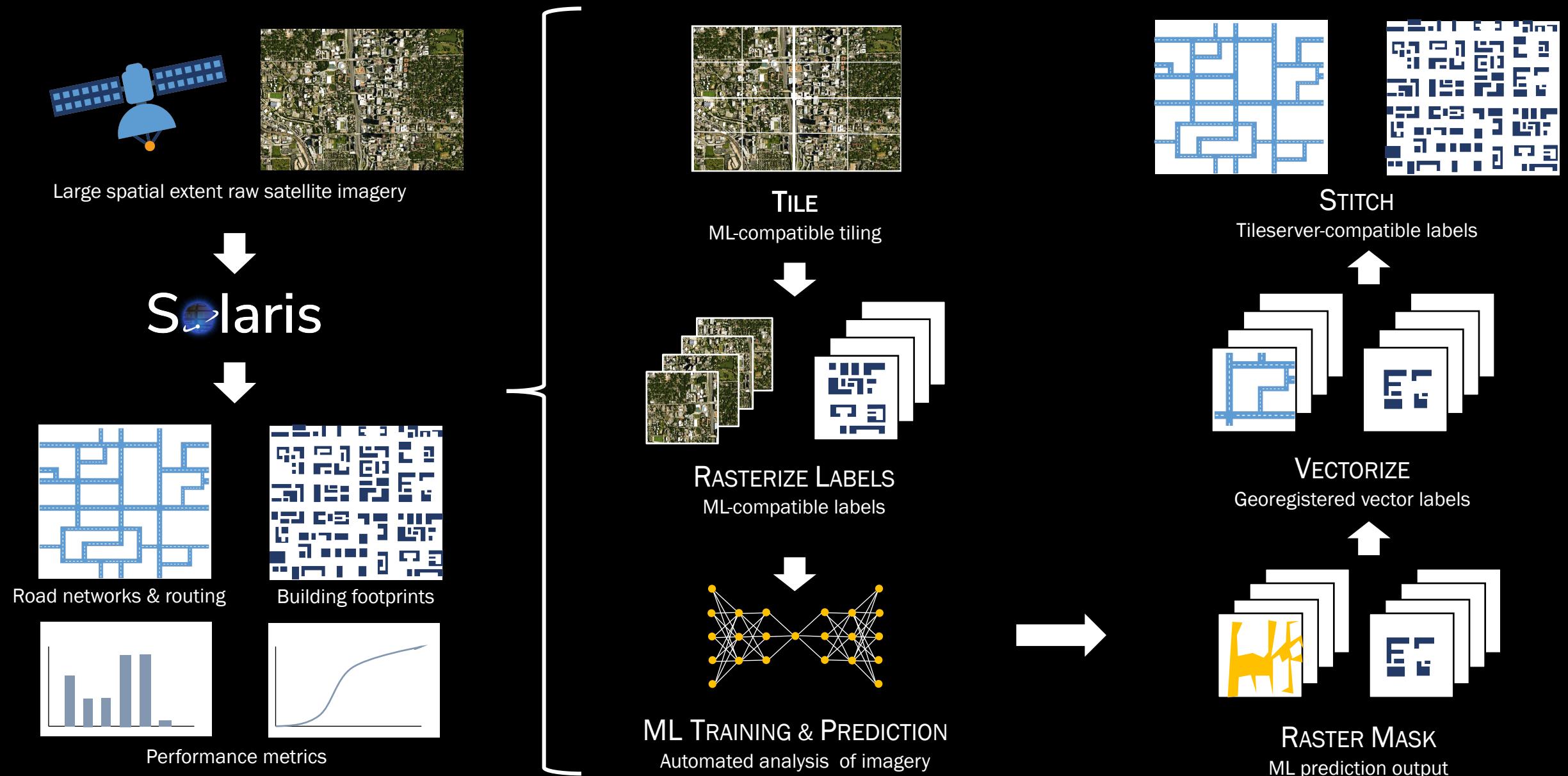
Kms of Road Labels

Required to Map Puerto Rico After Hurricane Maria

Goals of the workshop:

1. Go through some examples of using Solaris for automated overhead imagery analysis
2. Be able to answer these questions at a high level:
 - What is a neural net?
 - How do neural nets generate predictions?
 - How do you train neural nets to improve their predictions?
3. Be able to discuss different metrics for comparing predictions, and understand why picking the right metric matters
4. Train a neural net with Solaris and get a cool t-shirt!

Applying ML to overhead imagery: the Solaris pipeline



Getting started

1. Log into your JupyterLab session:
 - A. Get your IP address from the workshop leaders
 - B. Navigate to [http://\[IP\]:8888](http://[IP]:8888)
 - C. Enter the password (get it from the workshop leaders)
2. Start notebook 1_intro_to_solaris.ipynb

Using Jupyter notebooks:

- Make sure the notebook is running the solaris kernel (top right corner) after you start it up
- Shift+Enter to run a code cell
- Run each code cell in order
- Stop the notebook after you finish (right-click in the folder menu and select “terminate”)