

Human-in-the-loop Machine Learning

with Realtime Model Predictions on Satellite Images



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Element 84 is a woman-owned small business that works with public, private, and non-profit sector clients to **develop geospatial data processing pipelines & build software that helps answer big questions** about our health, our infrastructure, and our changing planet.

We make custom, **cloud-based geospatial software**
at the regional, national, and international scale.

Customers & Partners

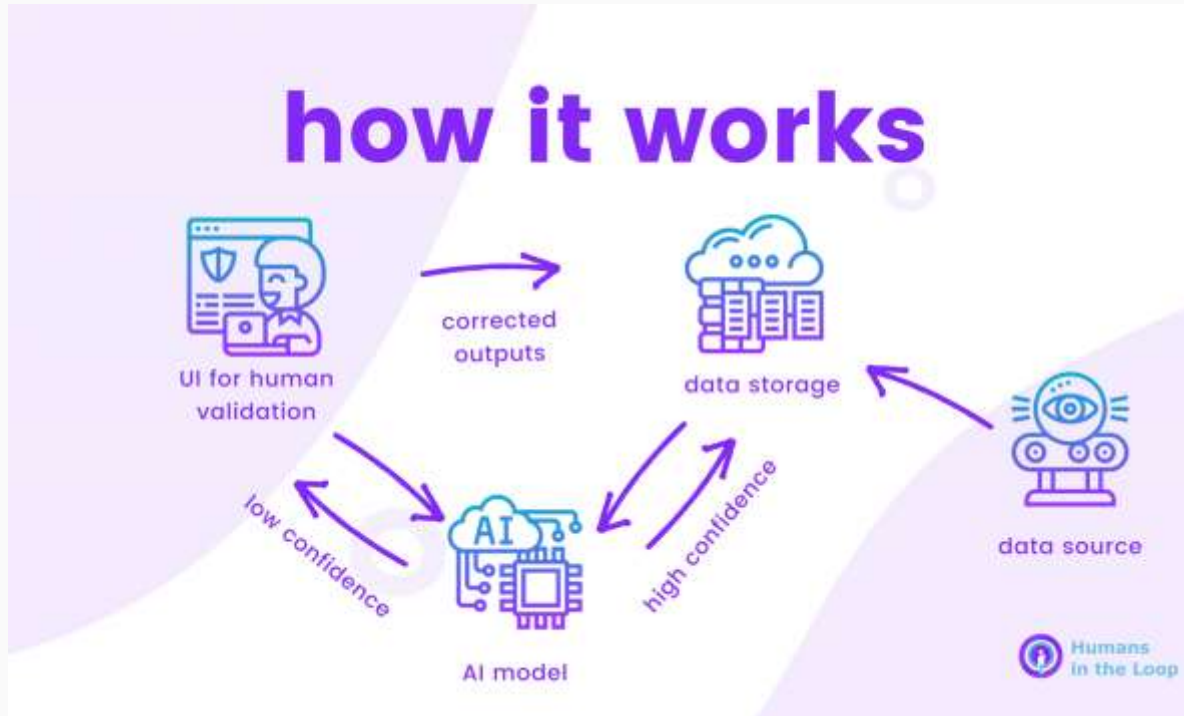


US Army Corps
of Engineers®



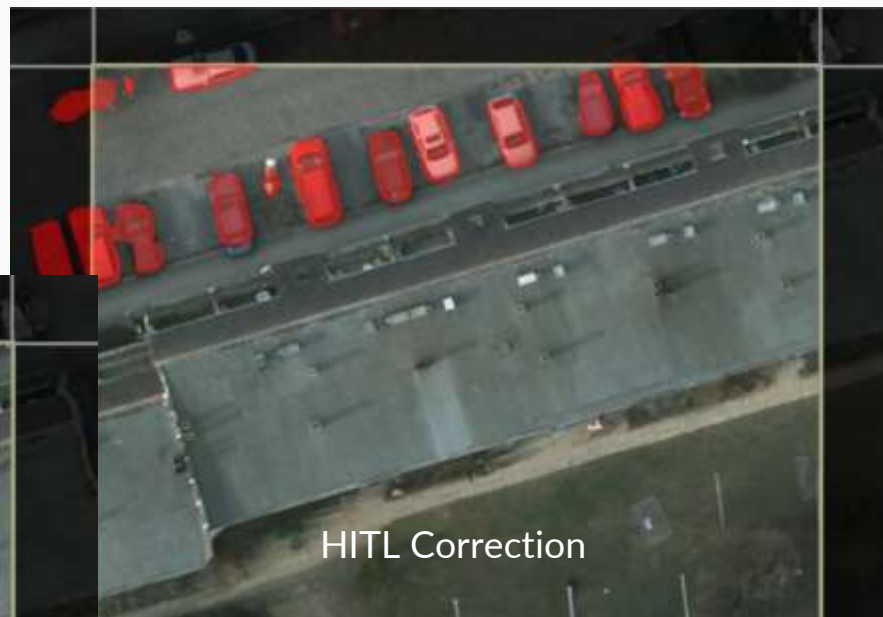
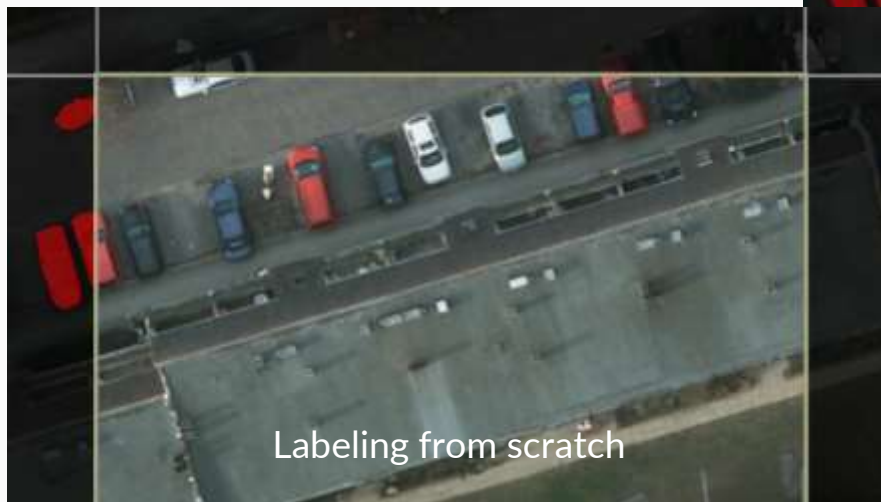
Human-in-the-loop

Human-in-the-Loop (HITL) ML



Why use HITL approach?

- Gather training data more efficiently



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- Model transparency



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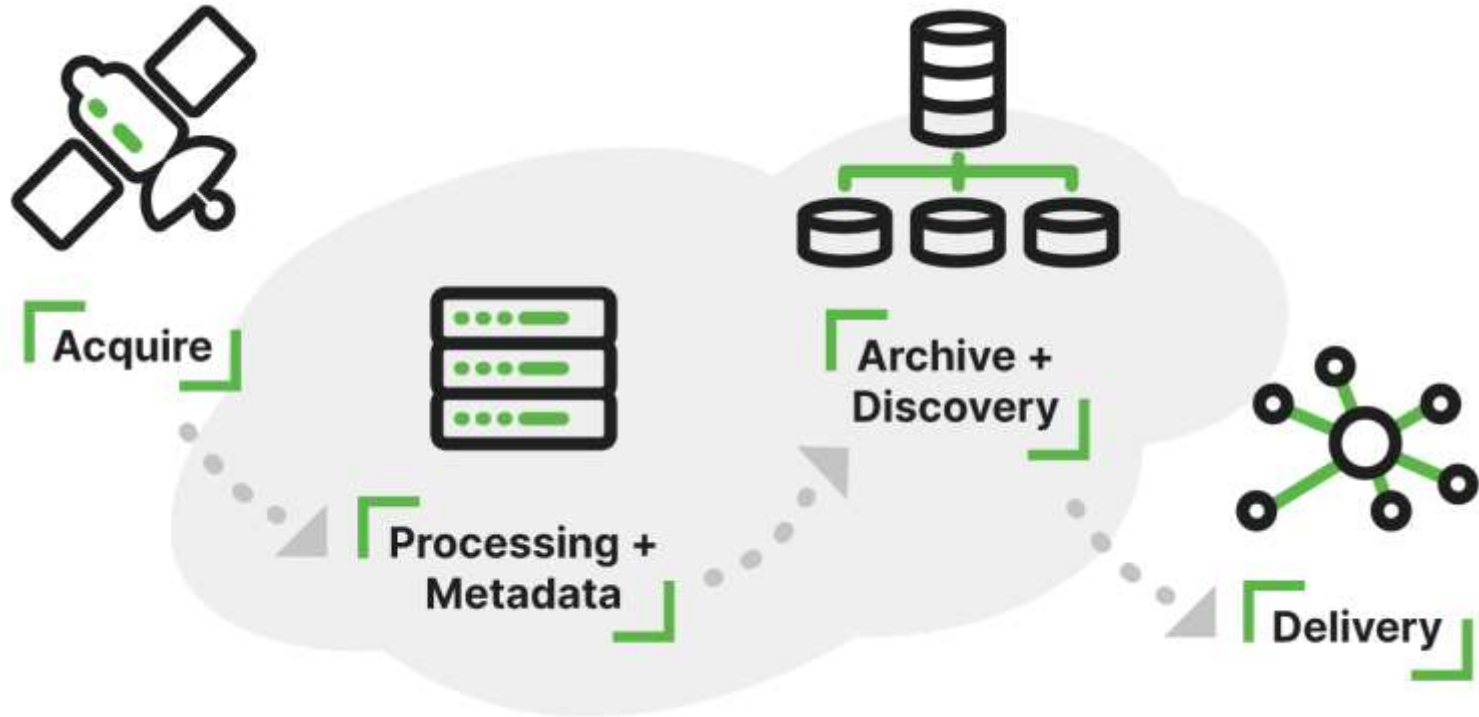
- Gather training data more efficiently
- Model transparency
- Verify low confidence cases



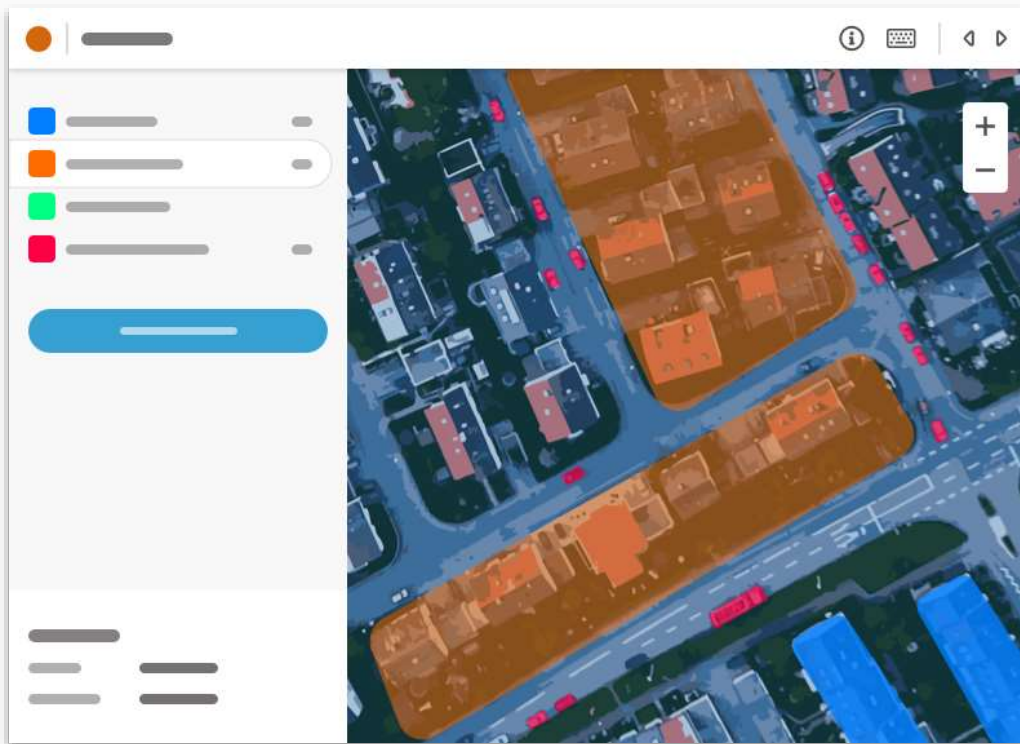
Why Element 84?



FilmDrop



GroundWork



Semantic Segmentation



Object Detection

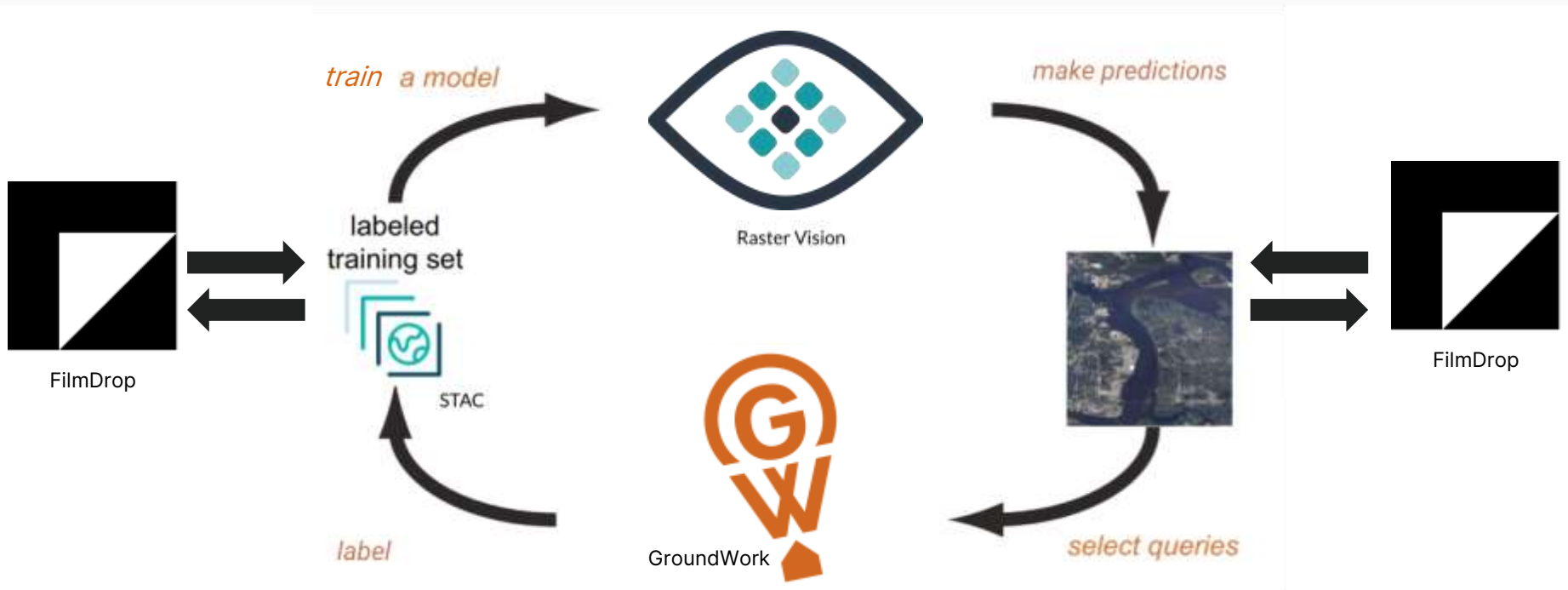


Chip Classification

rastervision

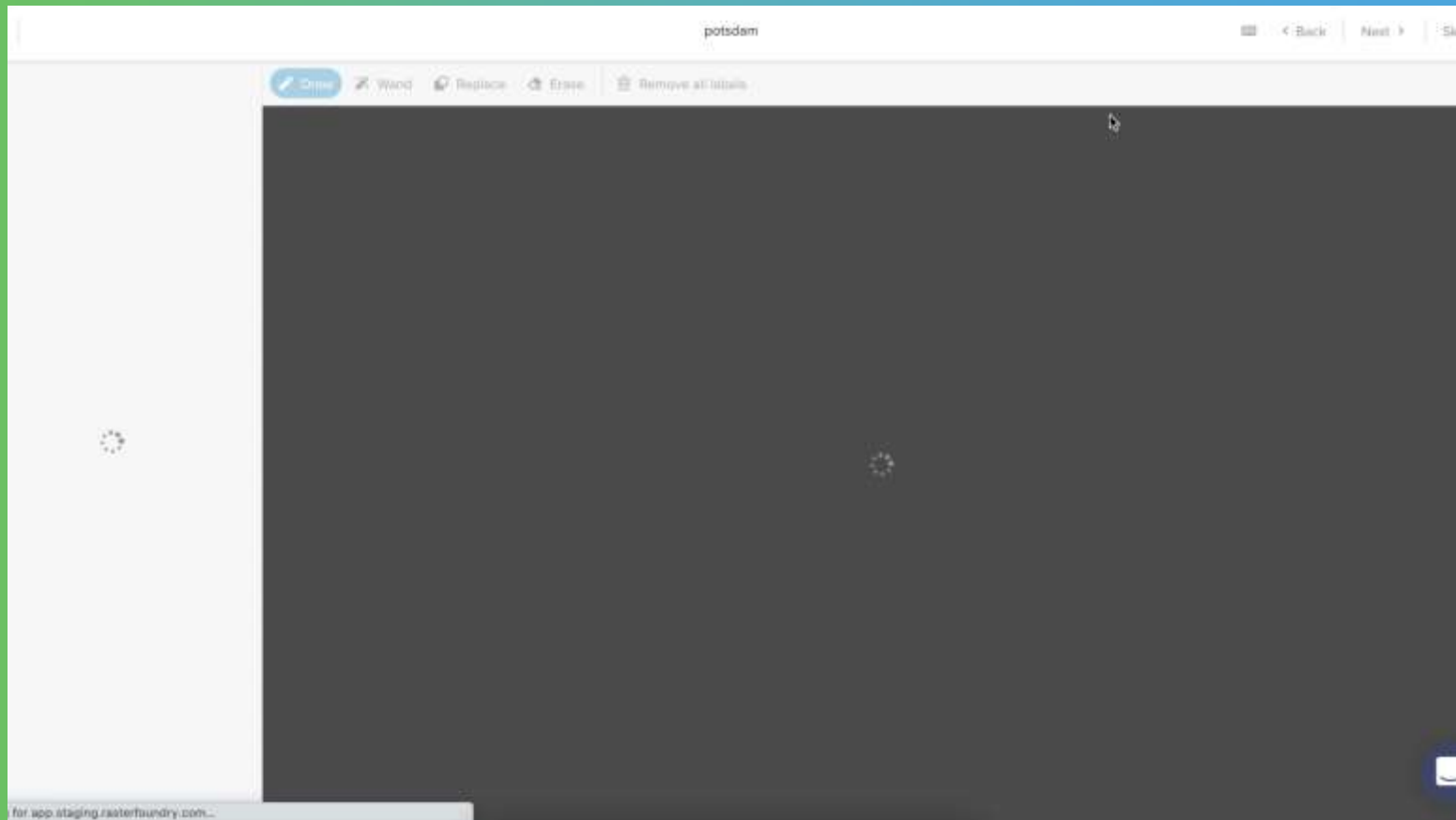


A HITL approach



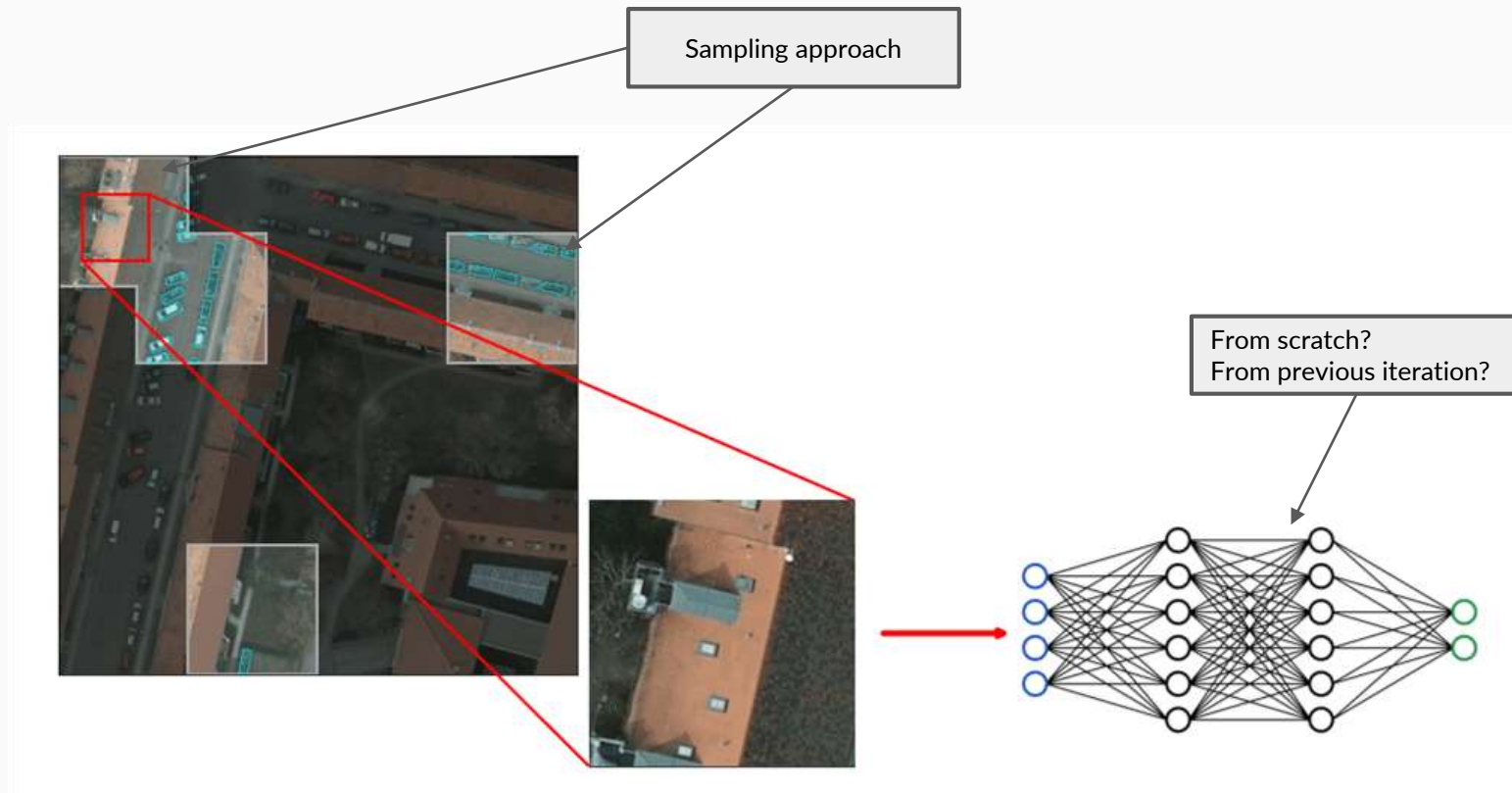
HITL

in action



Under the hood

Train a model



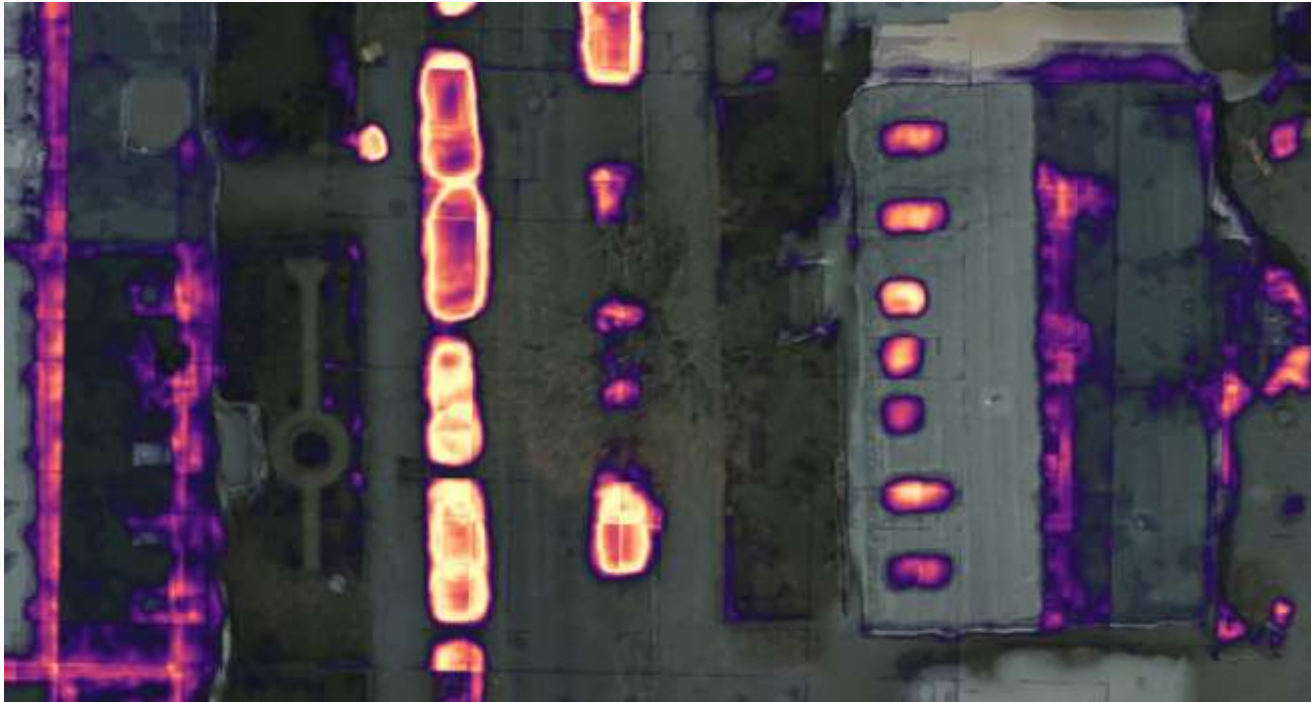
Predict pixel probabilities



Predict segmentation polygons



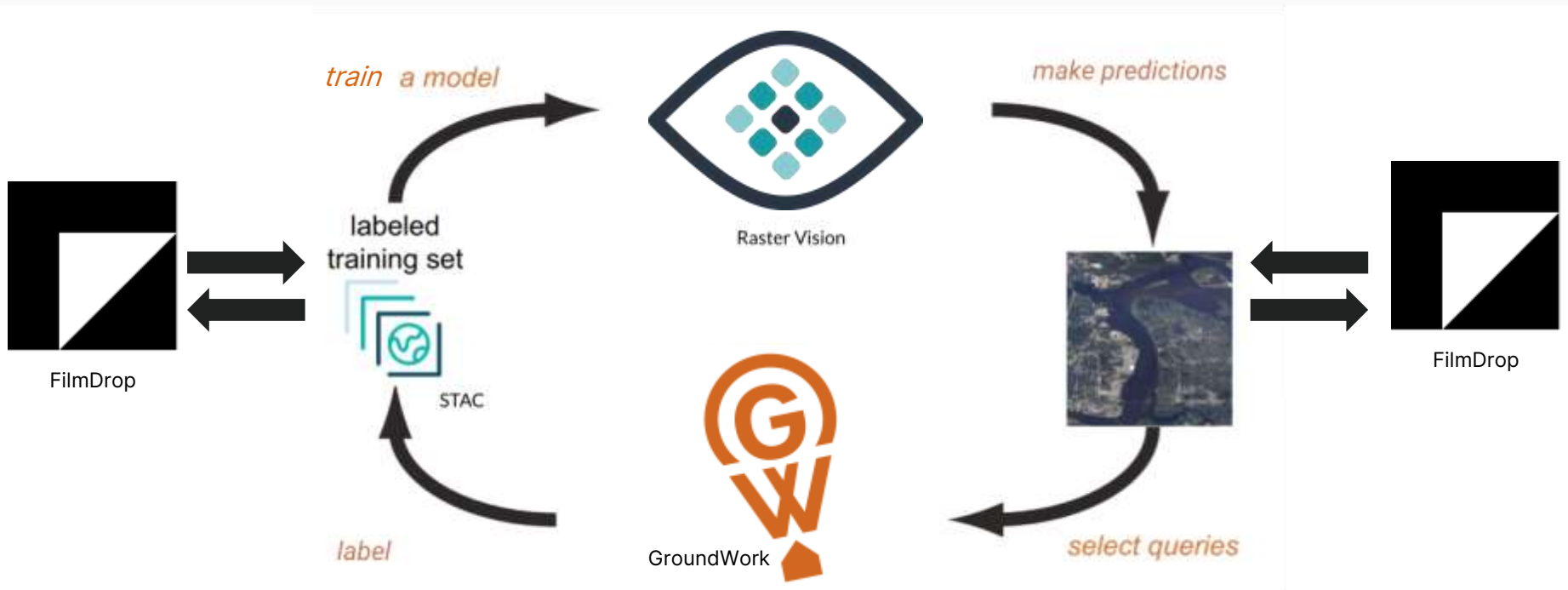
Compute uncertainty scores (entropy)



Aggregate uncertainty scores (average)

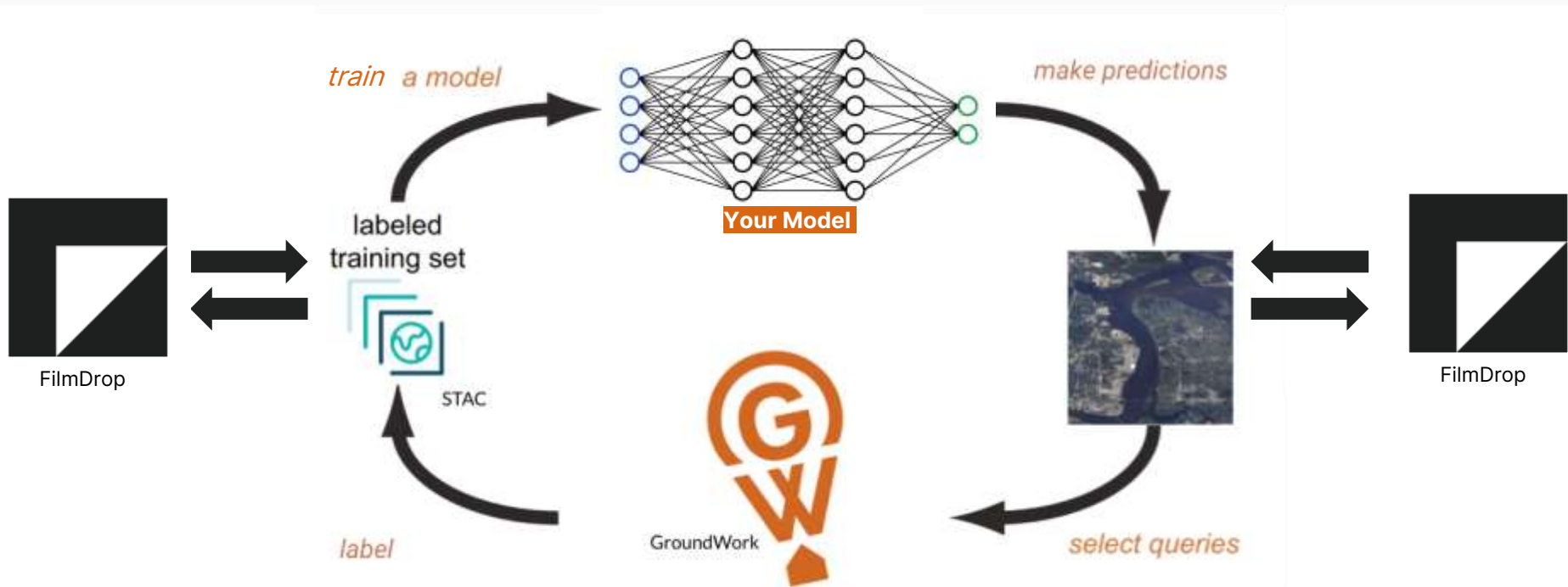


A HITL workflow

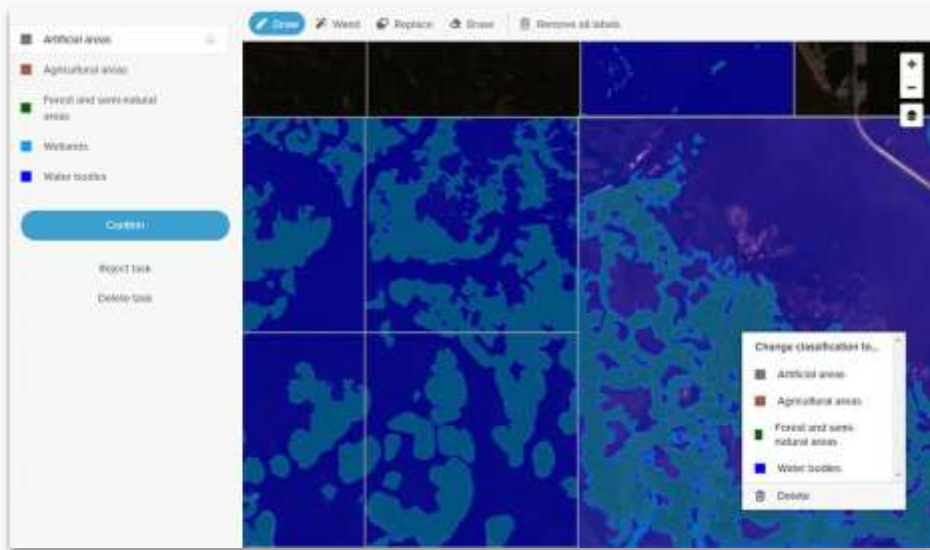


Coming soon...

Bring Your Own Model



Segment Anything



Source: <https://ai.facebook.com>

Interested to try?



FilmDrop
Demo



GroundWork
Contact



Raster Vision
Github



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Questions?

- Is GroundWork open-source?
- Do you have any labeled dataset that is public?
- I have a labeled dataset, how can I use it in Raster Vision models?
- I want to use my own model in HITL, how to start?