Human-in-the-loop Machine Learning with Realtime Model Predictions on Satellite Images
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.
Human-in-the-loop
Human-in-the-Loop (HITL) ML
Why use HITL approach?

- Gather training data more efficiently

Labeling from scratch

HITL Correction
Why use HITL approach?

- Gather training data more efficiently
- Model transparency
Why use HITL approach?

- Gather training data more efficiently
- Model transparency
- Verify low confidence cases
Why Element 84?

- GroundWork
- FilmDrop
- STAC SpatioTemporal Asset Catalog
- rastervision
Acquire

Processing + Metadata

Archive + Discovery

Delivery
A HITL approach

1. FilmDrop
2. STAC
3. GroundWork
4. Raster Vision
5. FilmDrop

- Train a model
- Label training set
- Select queries
- Make predictions

Diagram illustrating the HITL approach with FilmDrop, STAC, GroundWork, and Raster Vision.
Under the hood
Train a model

Sampling approach

From scratch?
From previous iteration?
Predict pixel probabilities
Predict segmentation polygons
Compute uncertainty scores (entropy)
Aggregate uncertainty scores (average)
A HITL workflow

train a model

labeled training set

label

make predictions

select queries

FilmDrop

GroundWork

Raster Vision

FilmDrop
Coming soon...
Bring Your Own Model

Diagram showing the process of training a model using labeled training set, making predictions, and selecting queries.
Segment Anything

Source: https://ai.facebook.com
Interested to try?

- FilmDrop
  - Demo
- GroundWork
  - Contact
- Raster Vision
  - Github
Learn more about what we do

Element84.com  @Element84  @Element84  @Element84
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?