SPACEML

ML for Space Science, Exploration and all Humankind

Our Team

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Advisors

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Satyarth Praveen

Meher Kasam

Siddha Ganju

Further Contributors

Fernando

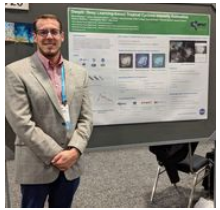
Mike

Shivam

Deep

Surya

Erin



Brian

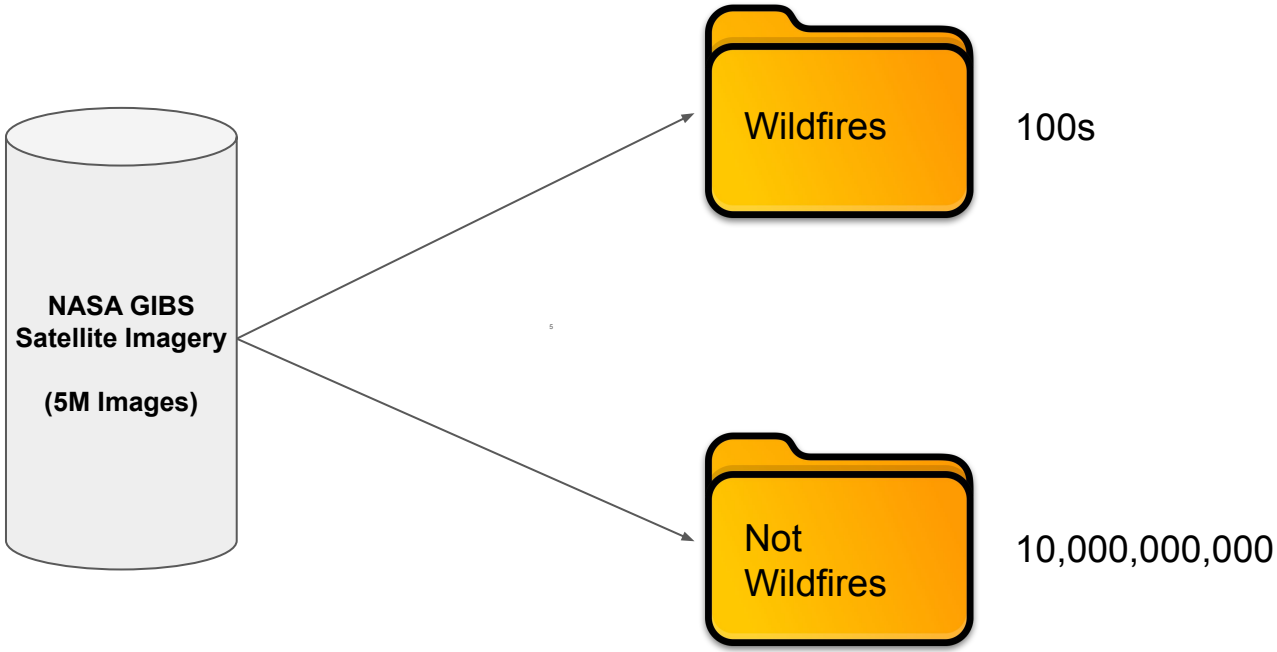
Abhigya

Rajeev

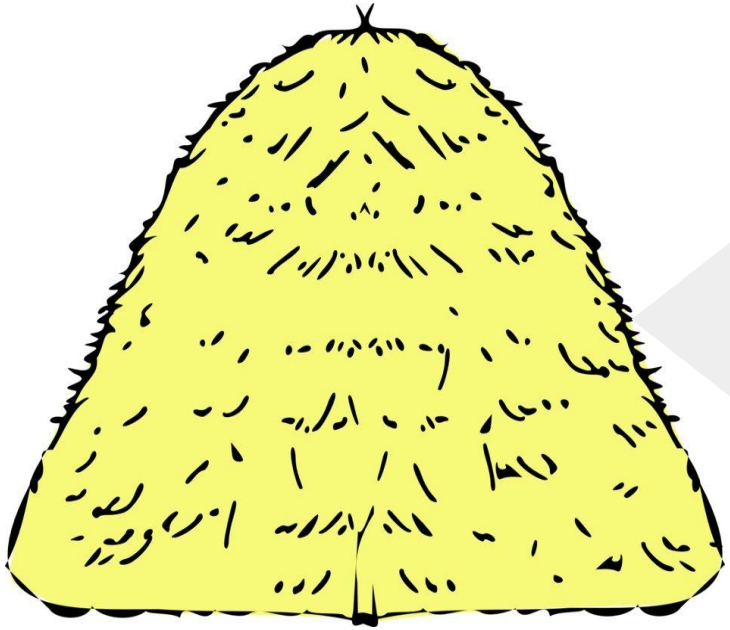
Esther

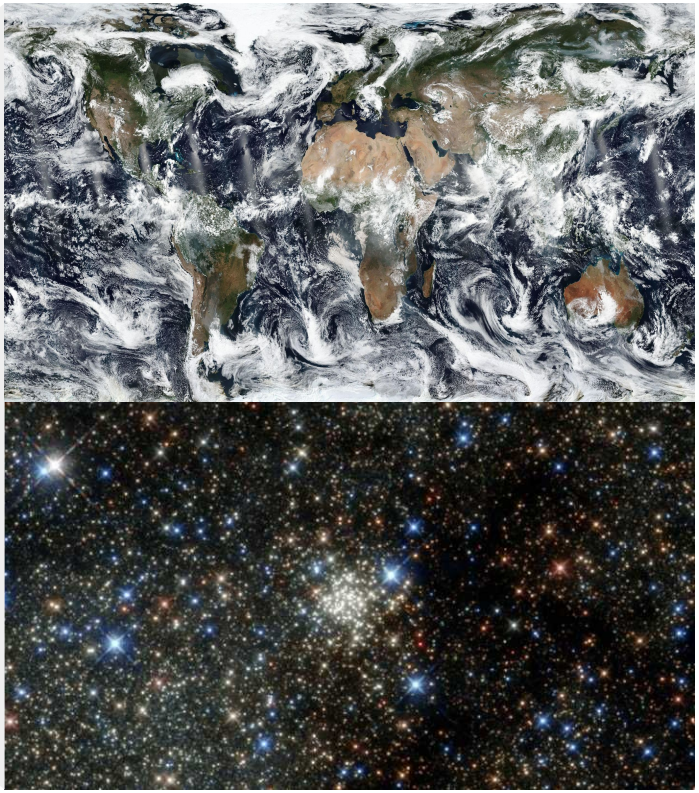
Sarah

40 *Petabytes*

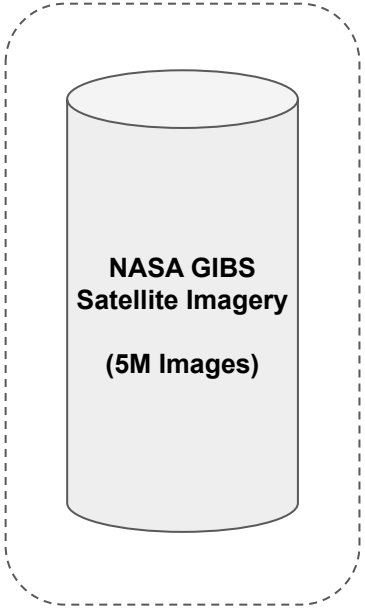

NASA GIBS
Satellite Imagery
(5M Images)
Wildfires
100s
Not
Wildfires
10,000,000,000

Finding a Needle in a Haystack

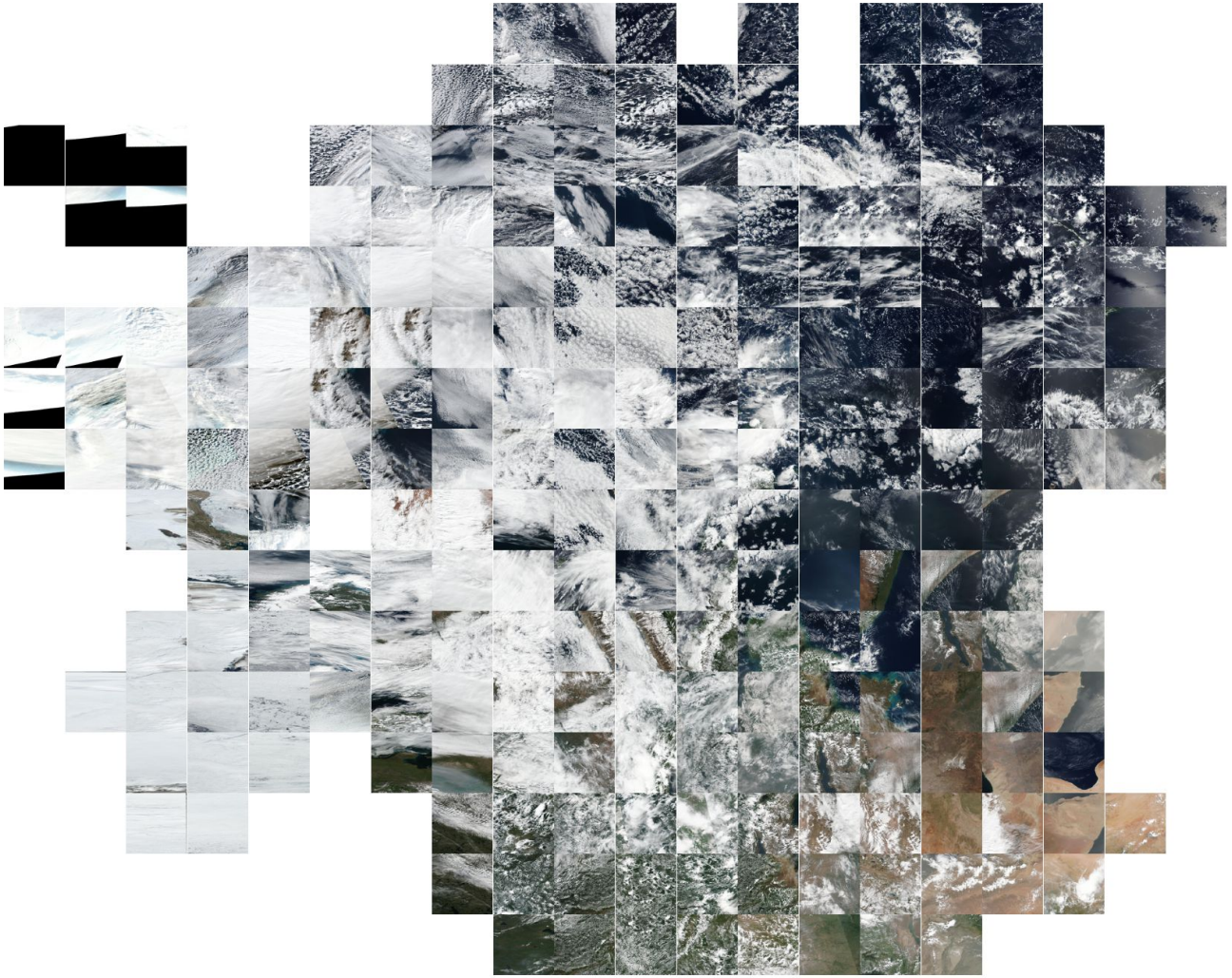




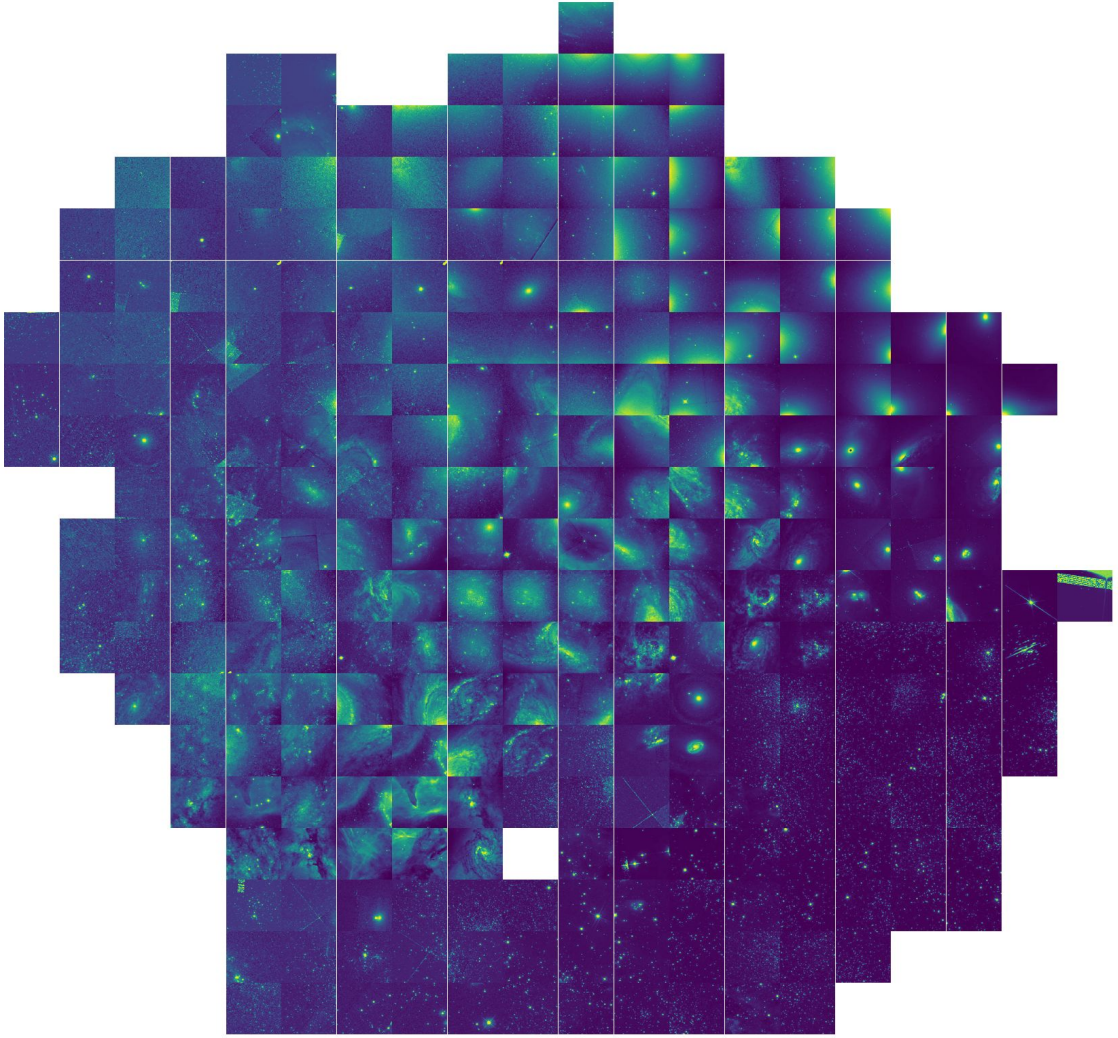
Enter:
Self-Supervised Learning



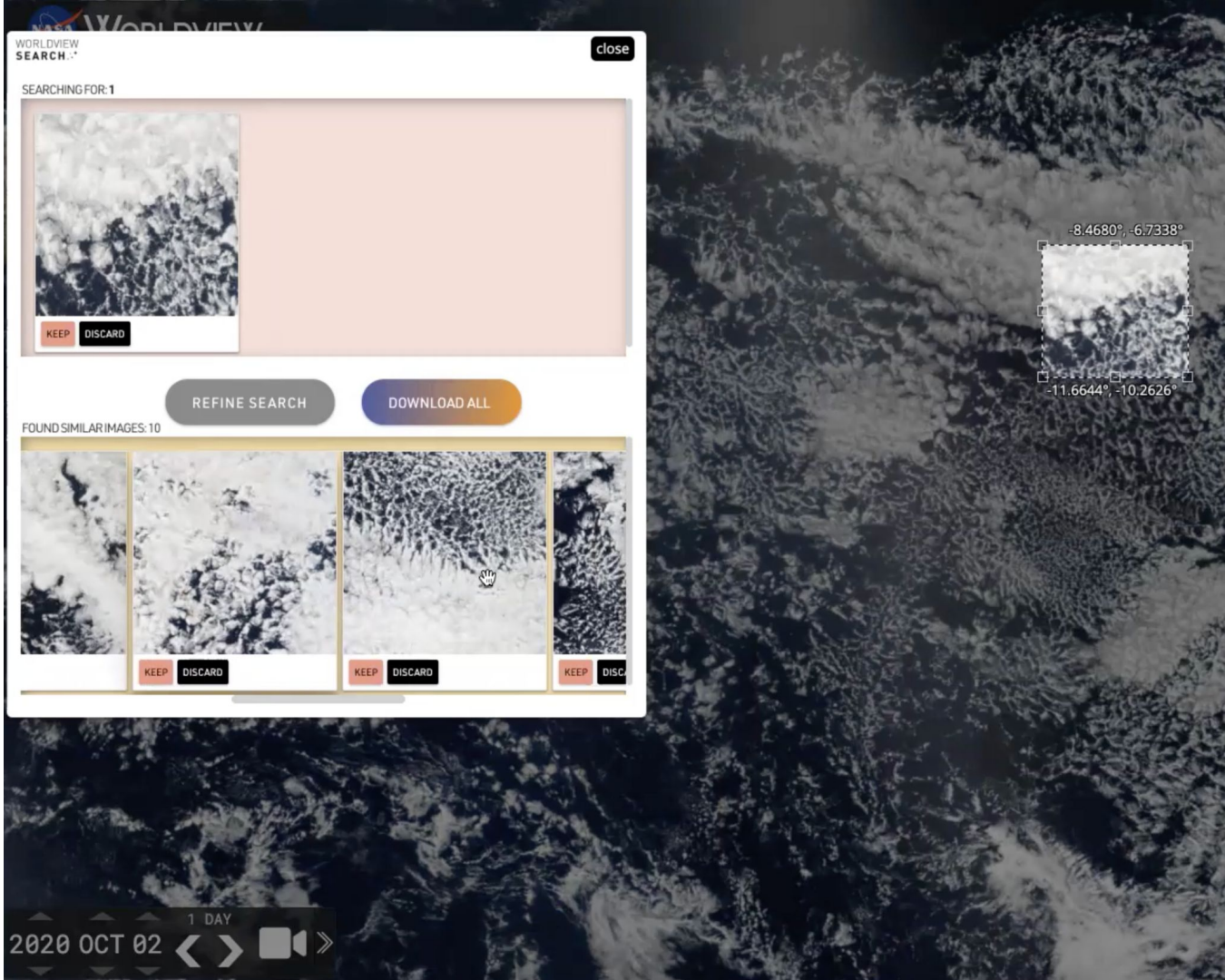
Earth



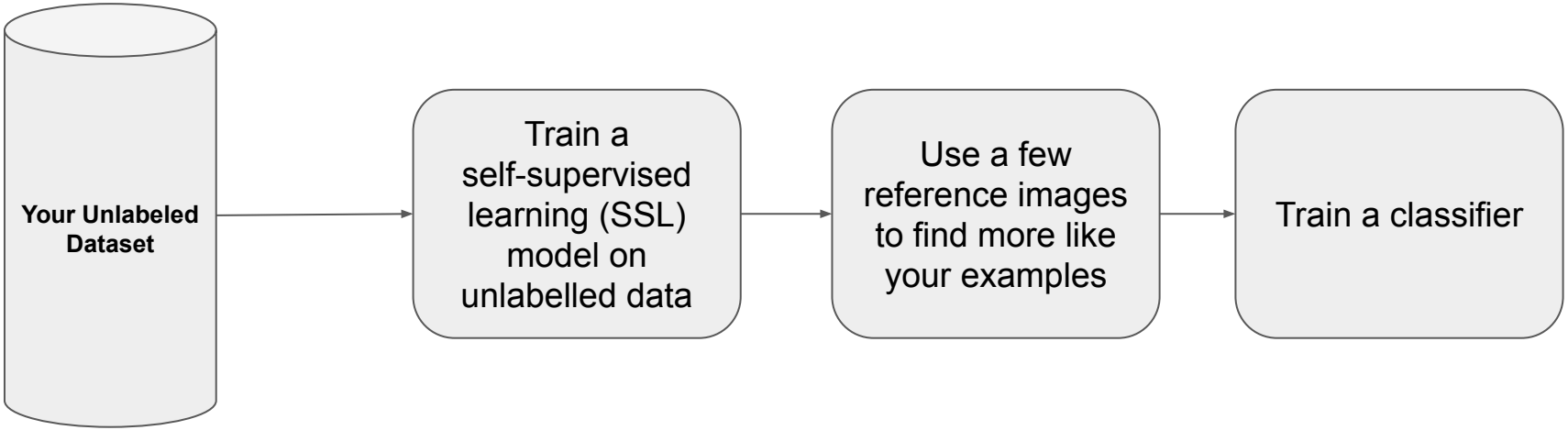
Hubble



Earth

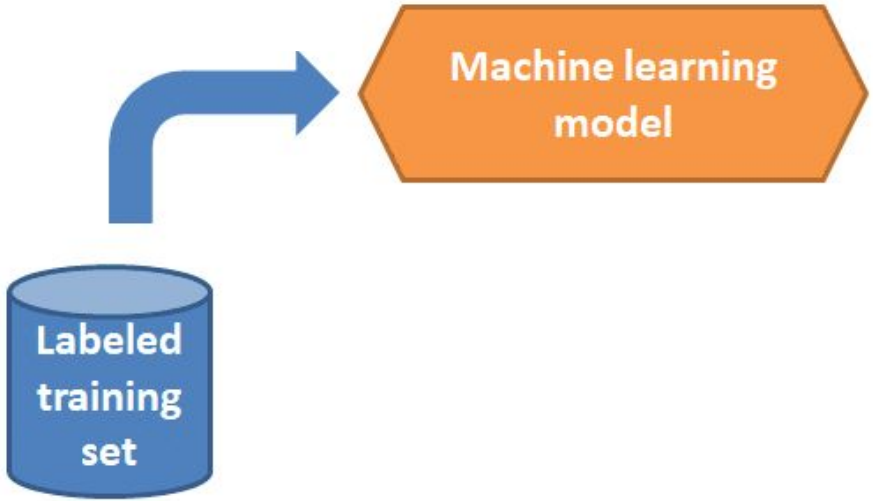

WORLDVIEW
SEARCH
close
SEARCHING FOR: 1
KEEP
DISCARD
REFINE SEARCH
DOWNLOAD ALL
FOUND SIMILAR IMAGES: 10
KEEP
DISCARD
KEEP
DISCARD
KEEP
-8.4680°, -6.7338°
-11.6644°, -10.2626°
1 DAY
2020 OCT 02

Curator


Your Unlabeled Dataset
Train a self-supervised learning (SSL) model on unlabelled data
Use a few reference images to find more like your examples
Train a classifier

What is Active Learning?

What is Active Learning?



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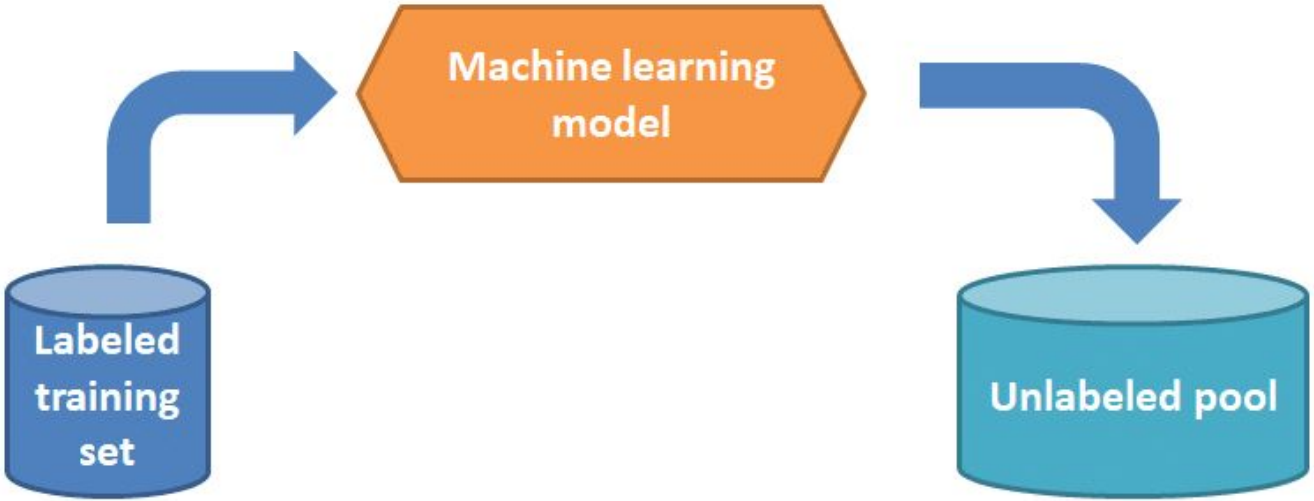

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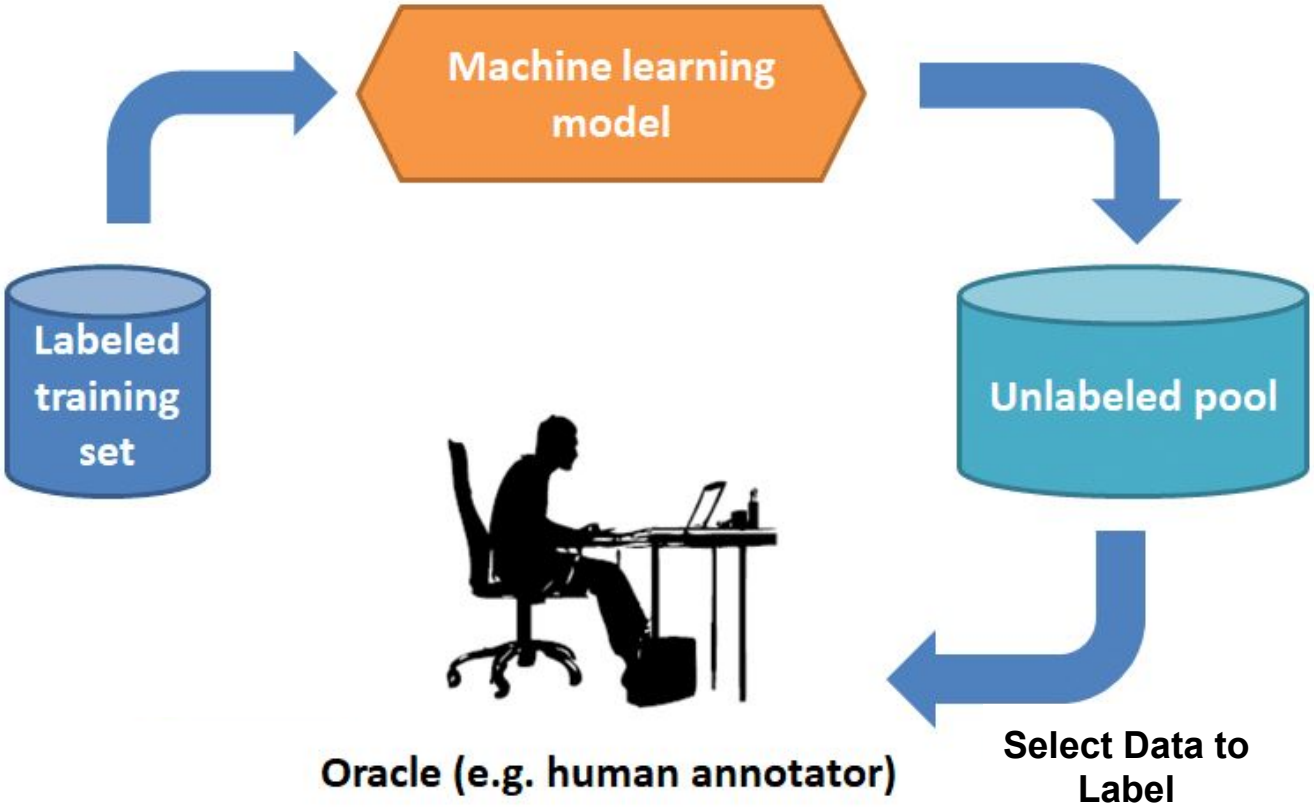

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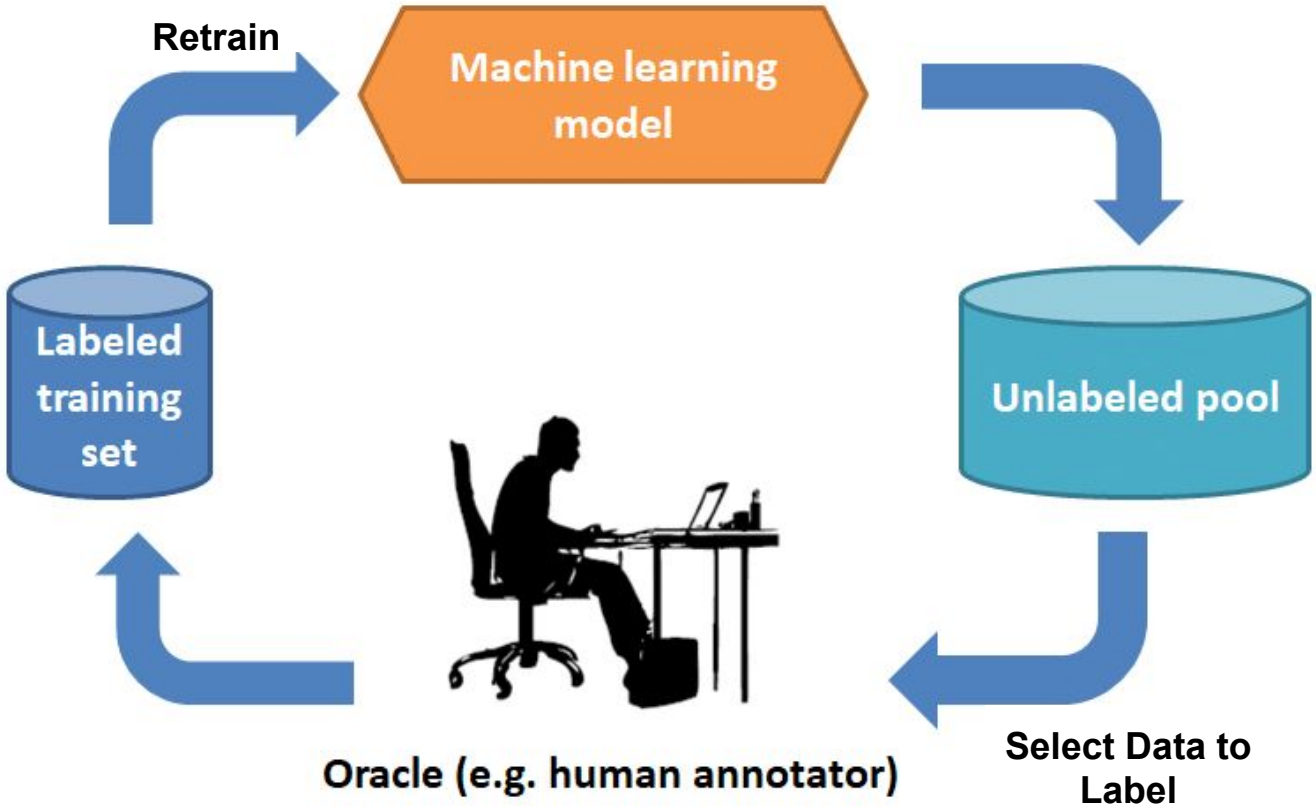

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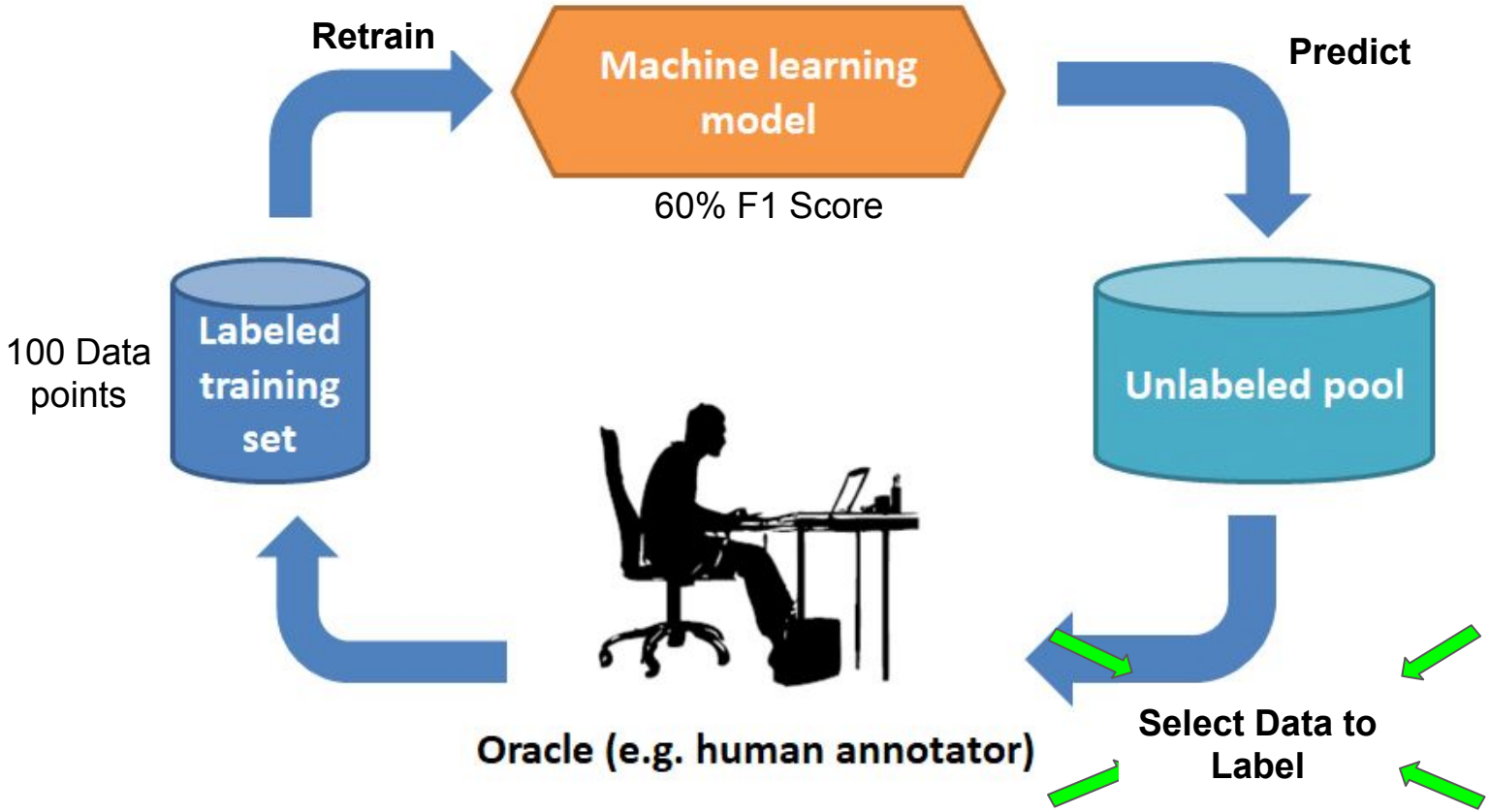

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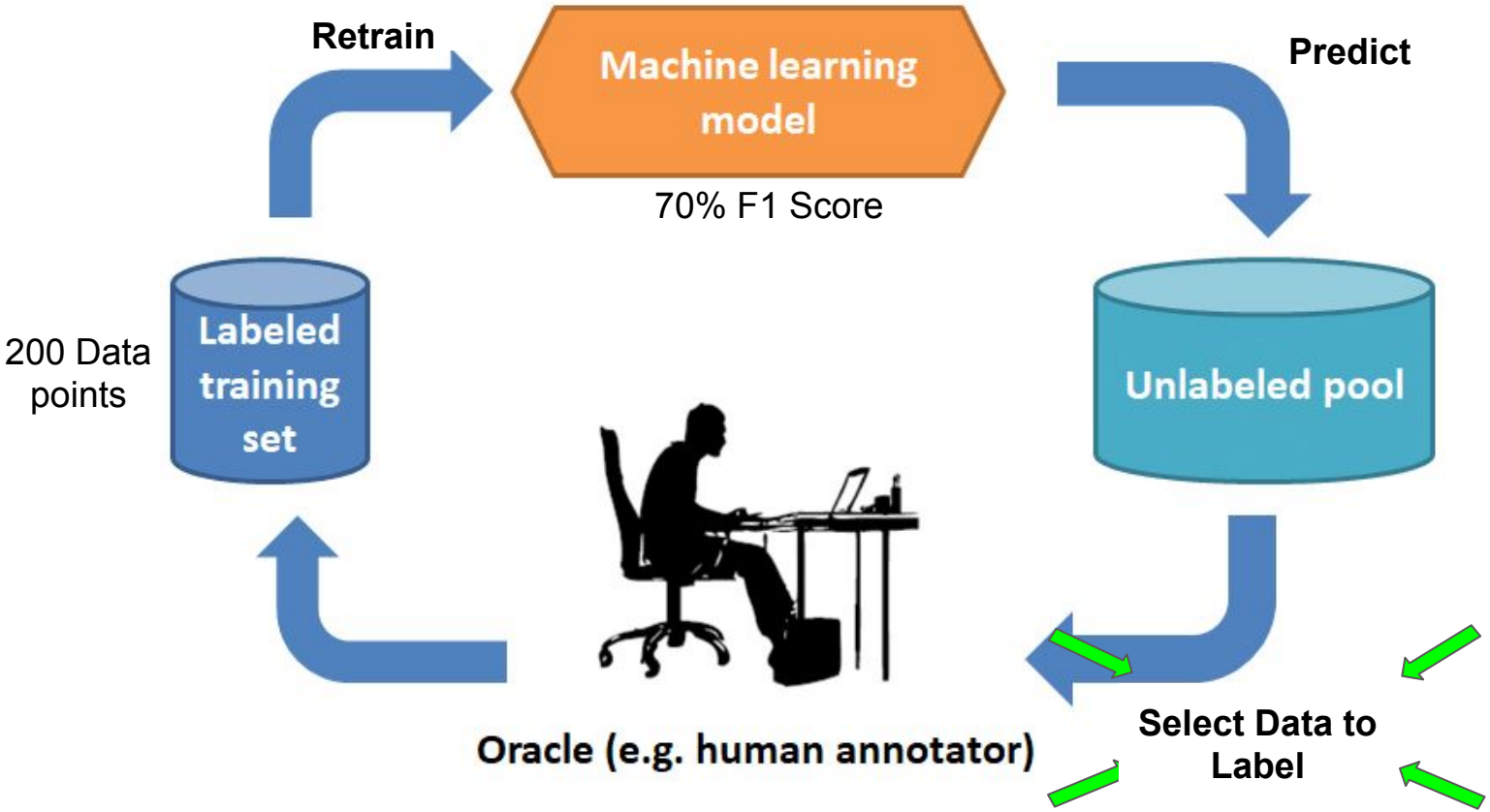

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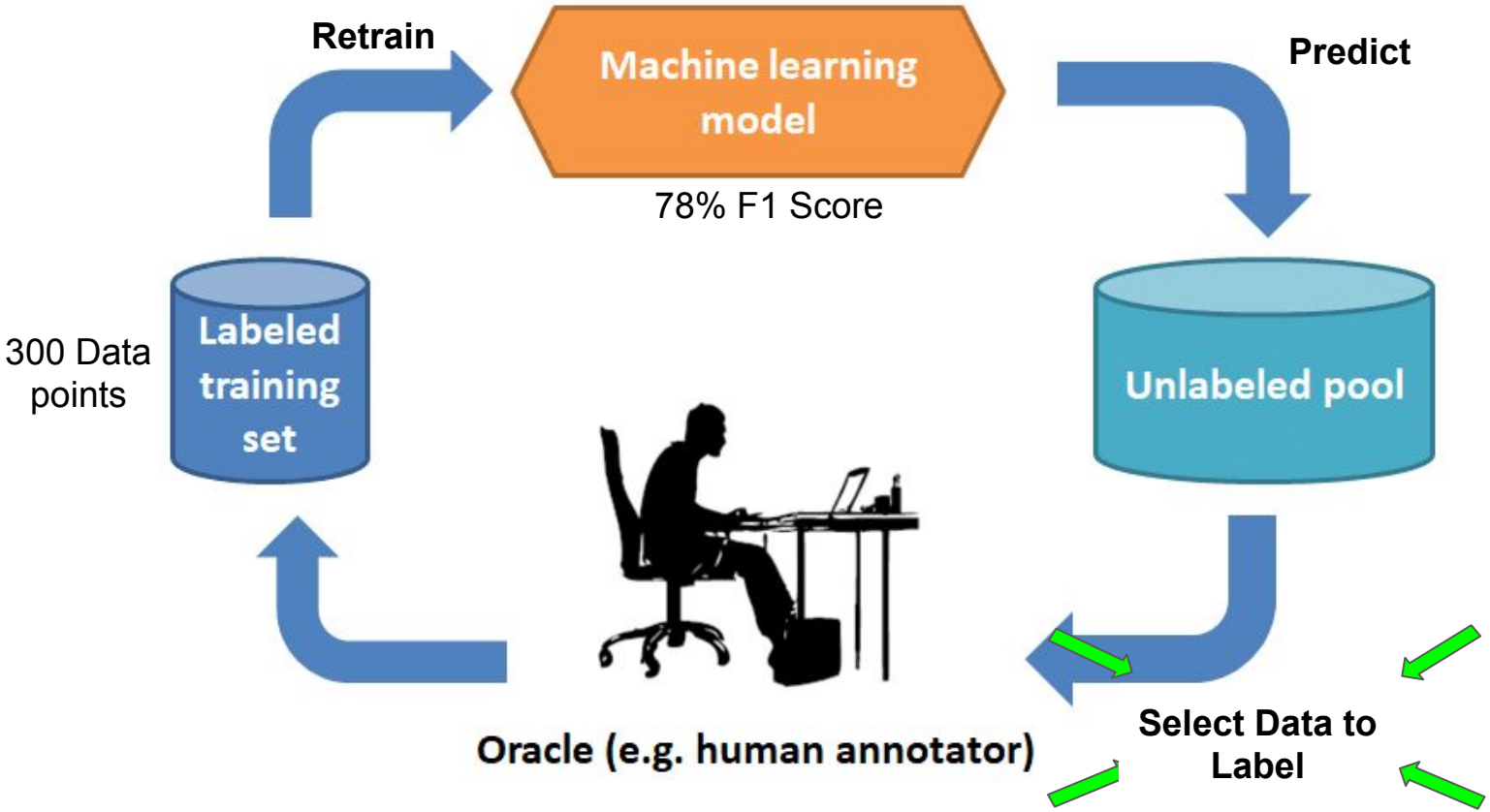

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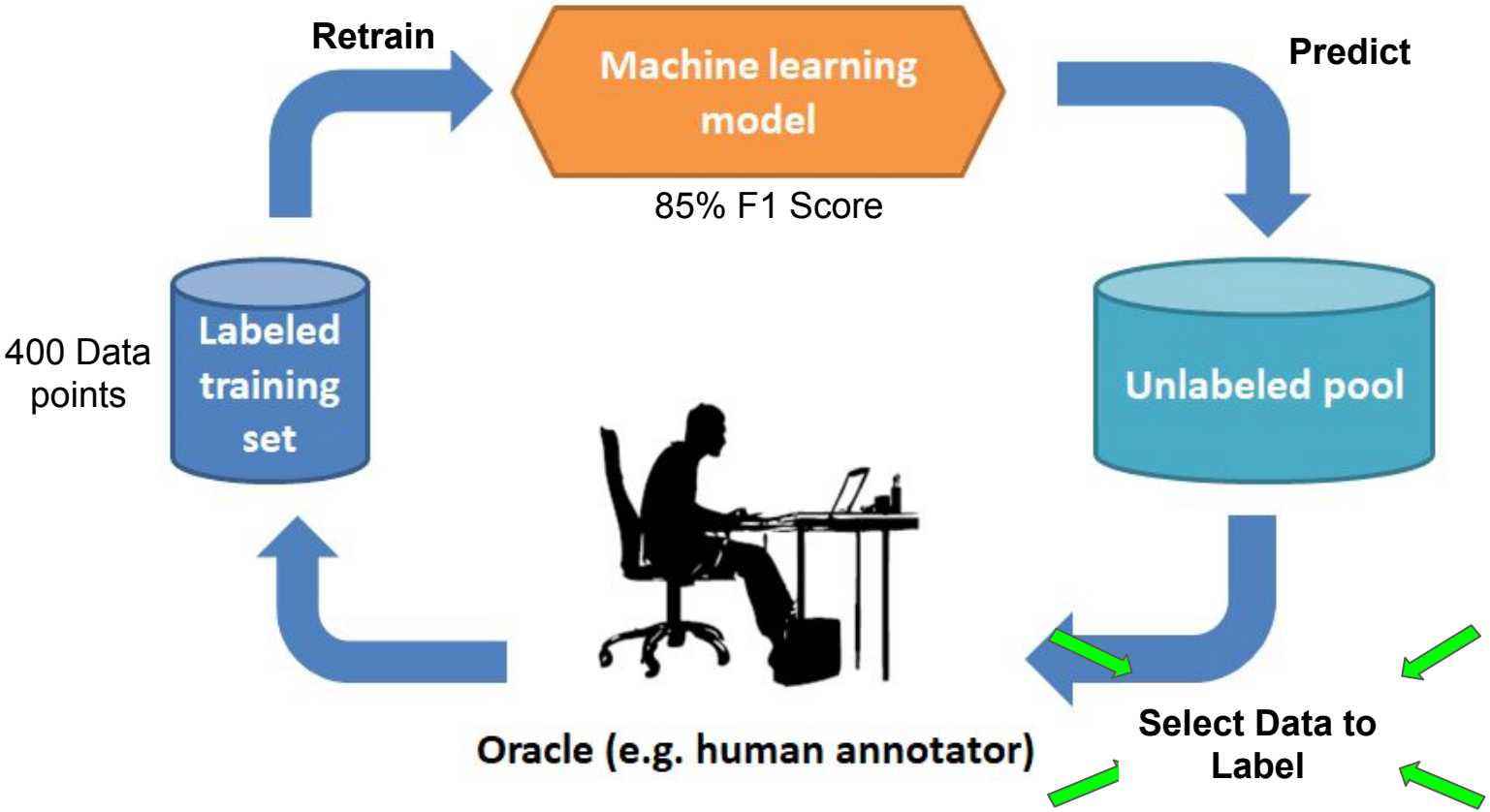

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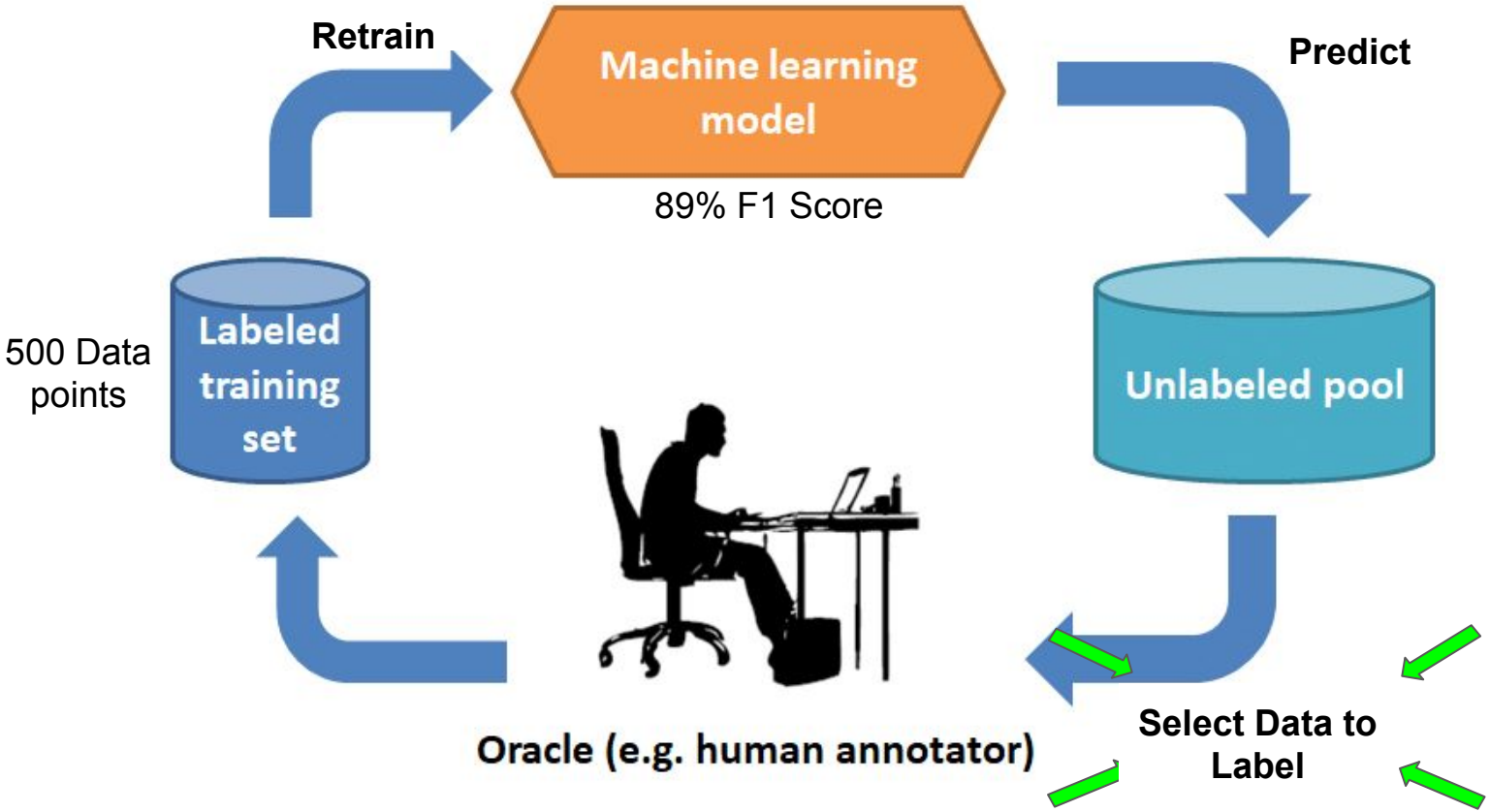
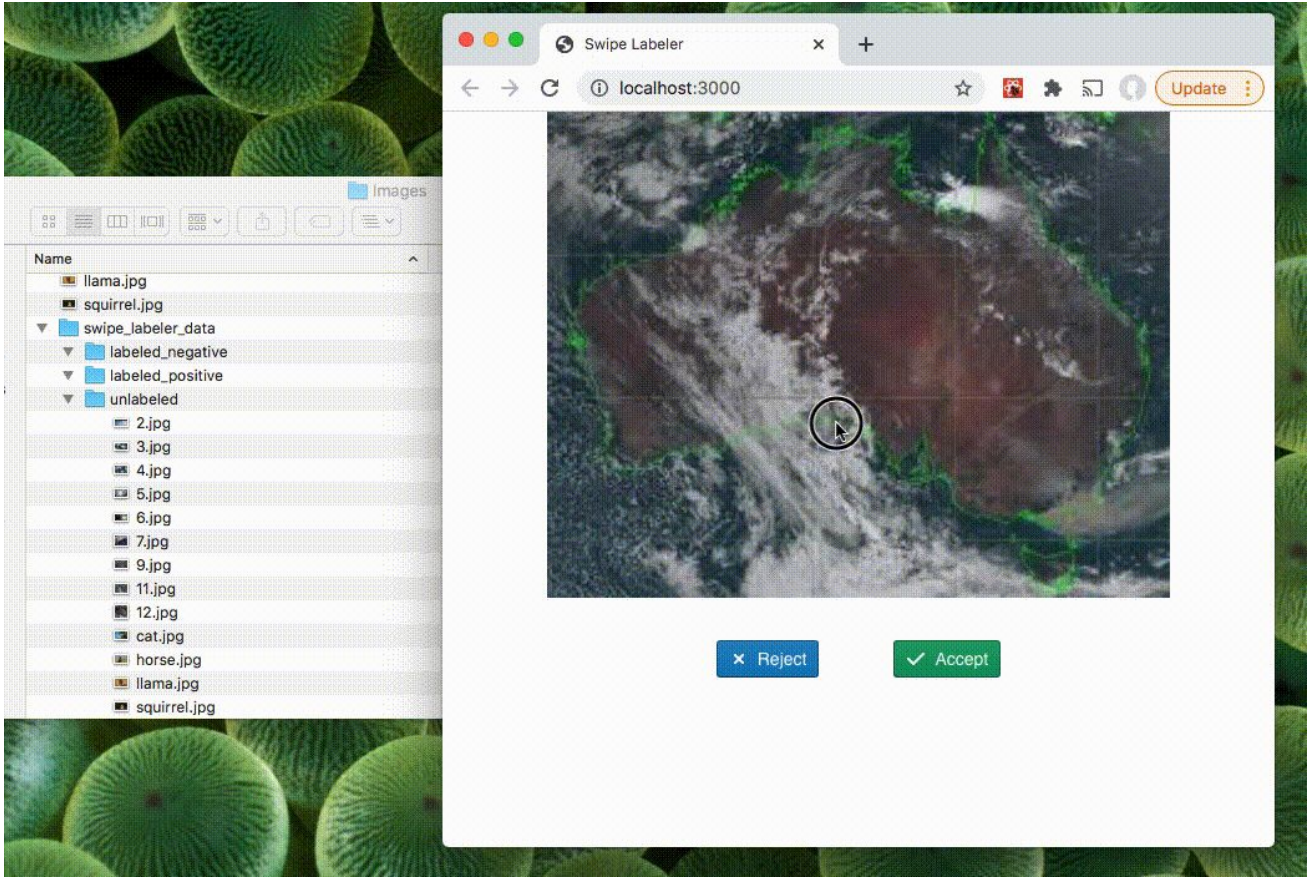




Swipe-Labeler:

Label Data Easily!

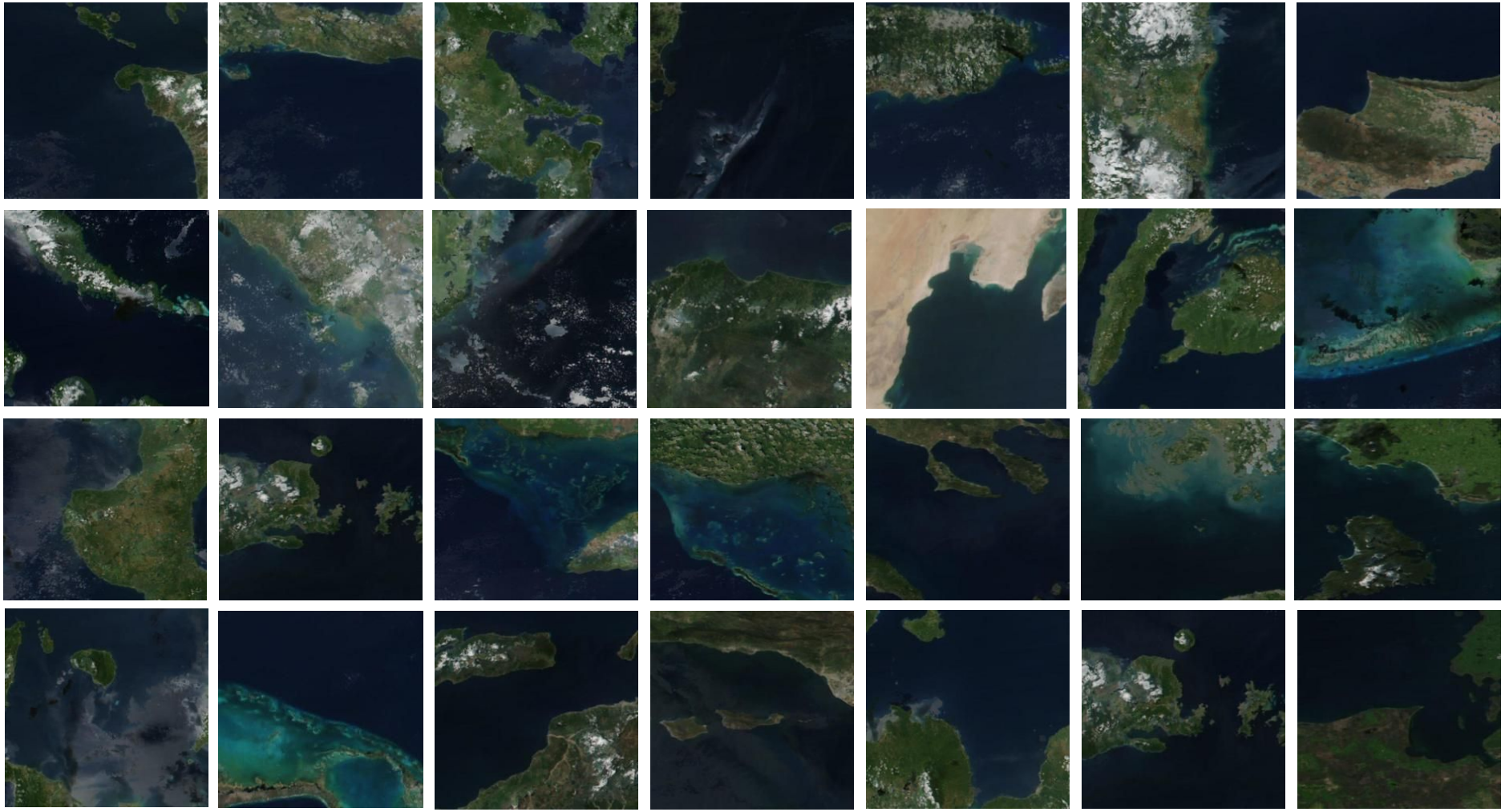
We did-this
for islands!

Using this →

out of 5M potential tiled images.

We Identified
~1000 islands out of
With probability > 0.75

In just 52 minutes



This Experiment Could Have Been Expensive!

Assumptions	Details
5 Million Tiles Daily	Tiles at different resolutions
5 Seconds an Image (7K Hours)	Our Experience as Unskilled Labeler
$15/Hr to Hire Annotator	$105,000 Annotation Cost

~~This Experiment Could Have Been Expensive!~~

Assumptions	Details
5 Million Tiles Daily	Tiles at different resolutions
5 Seconds an Image (7K Hours)	Our Experience as Unskilled Labeler
~~$15/Hr to Hire Annotator~~ Citizen Science!	~~$105,000 Annotation Cost~~ Priceless

To go from unlabeled to categorized takes

2 commands

Link[2]

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Thank you!

Thank you to Janusz Lisiecki, Joaquin Anton and the Nvidia DALI team for their guidance as we develop Curator!

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Citations

1. Chen, T., & Hinton, G. (2020, April 08). Advancing self-supervised and semi-supervised learning with simclr. Retrieved April 03, 2021, from https://ai.googleblog.com/2020/04/advancing-self-supervised-and-semi.html
2. https://github.com/spaceml-org/Self-Supervised-Learner