



MOONVISION



Annotation in Practice

2019

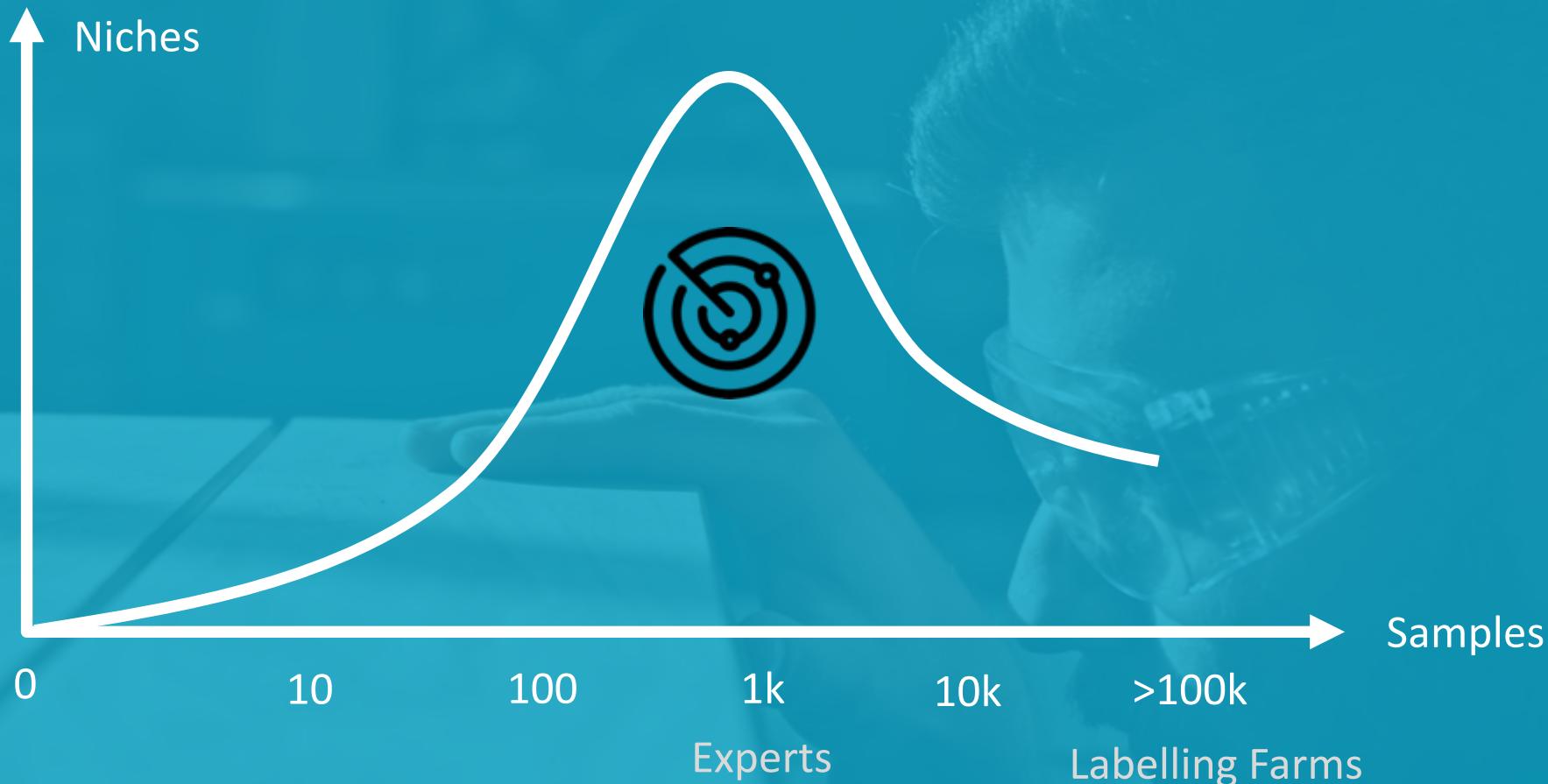
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Overview

- Intro
- 4 Lessons Learned ← Use Cases
- Tool

A blurred background image of a person's head and shoulders. The person is wearing a virtual reality headset and appears to be looking down at something. The overall color tone is blue.

We automate Quality Assurance with
Computer Vision



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Computer Vision

Plan

Prior Data	Target	Variance	Algorithm
?	?	?	?

→ Data Demand

Use Case:



<https://www.youtube.com/watch?v=s8o5JcmTkLE>

Use Case:

1

Result = Target



- 98.2% agreement for frequent dishes
- >20 types of dishes
- 28h of sample video (first two days)
- 1 day later in operation
- < 1 sec. latency from network source to marked-up video stream
- 3x20fps with 20% GPU load
- High resonance from industry



Trivia!



Oktoberfest – The Beginning

Prior Data	Target = Result	Variance	Algorithm
COCO	Tracking 98.2% Agreement	Finite Set Sizes +/- Motion Blur +/- Unbalanced	MobileNet SSD +

Data Demand:

Most frequent

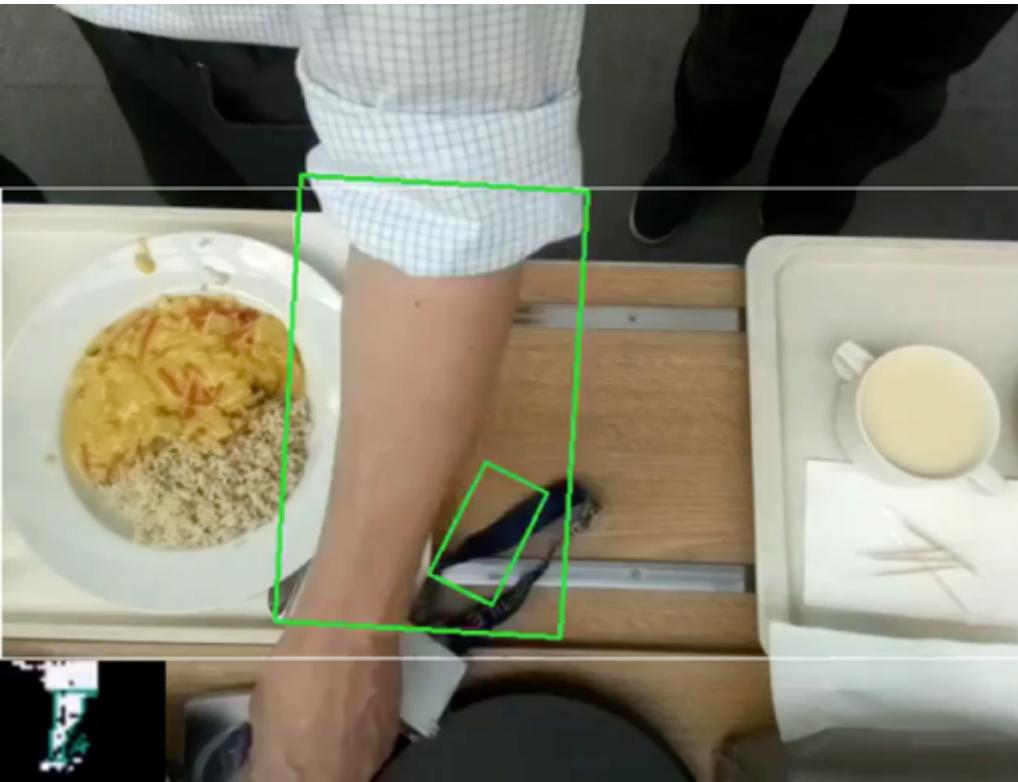
→ Least frequent

Images

Use Case:

1a

Dishtracker



Prior Data	Target = Result	Variance	Algorithm
Internal	Detection	Open Set	Few-shot

→ **Data Demand:**
1-4 per new category

♥ your false
positives

Lessons Learned:

2



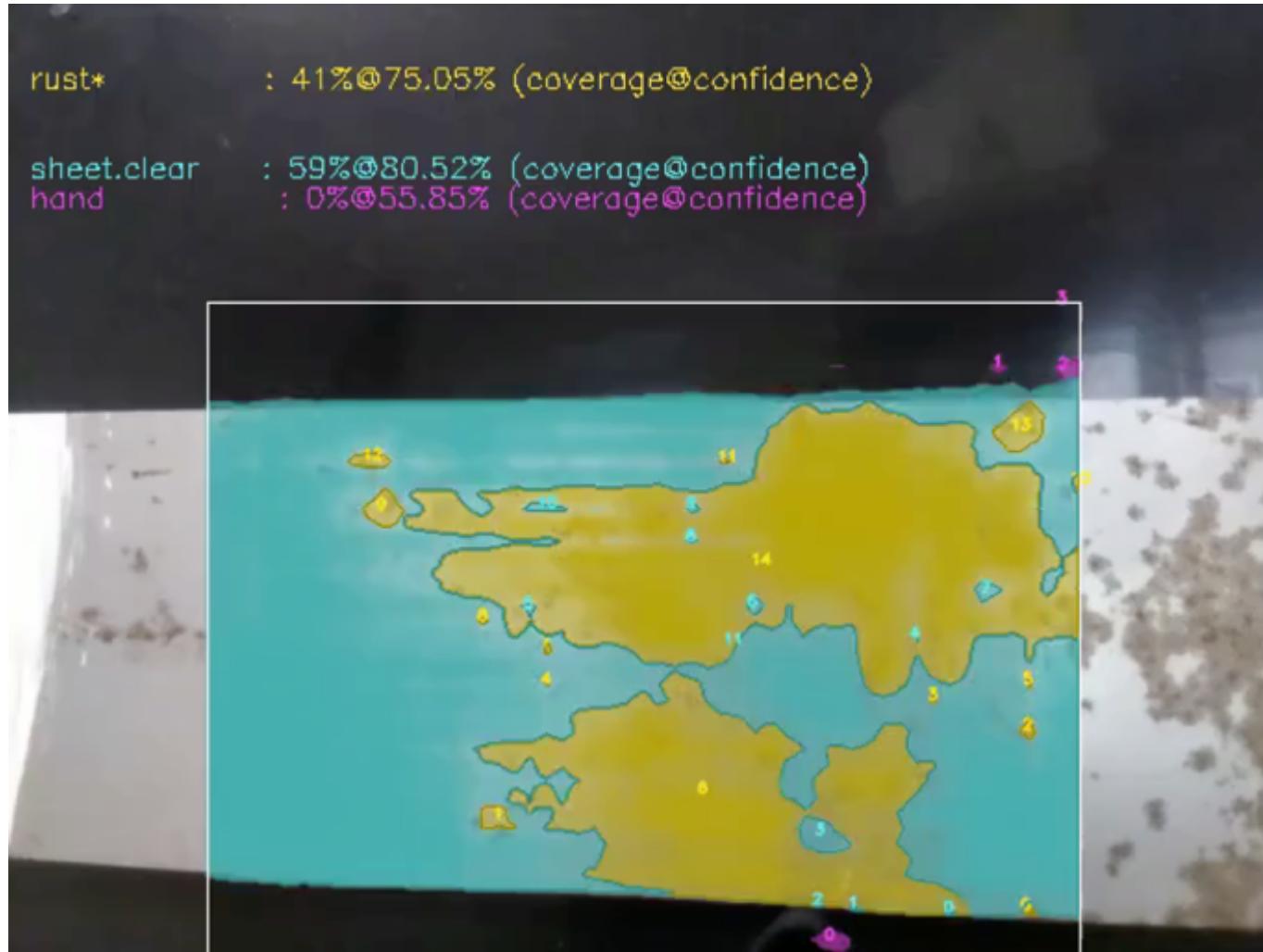
♥ your false
positives

...it's also data → Revise Ground Truth
→ Active Learning

Define Boundary Conditions

Use Case:

3



<https://www.youtube.com/watch?v=gbX5f-dEG9w>

Use Case:

3

Latest Version Rectangle Circle Polygon Cancel

Job: Rust and Paint with minimal data

In general: 8 neighboring pixels of the same class can be considered for a polygon or circle annotation.
To avoid labelling every small detail, ignore many patches with extremely fine sprinkled/unclear patches during training. Instead, annotate bigger areas of completely clean sheet. Plus, annotate category "sheet.other" to avoid mixing up phenomena that we might care about later.

-) background: black (don't label)

0) sheet: up to the edges of the sheet (draw at the end so the polygon doesn't hinder too much)
0) sheet.other: some unexpected phenomenons (scratches, ..)

1) rust.light: covered by the slightest tint of brownish ~~discolorization~~
1) rust.medium: covered by the most frequent brownish ~~discolorization~~
1) rust.heavy: covered by deeper (mostly darker) rust
2) paint: anything that is not completely void of white paint
3) paint.rust: if brownish patches show through (even tiny or weak ones)
...

Prior Data	Target	Variance	Algorithm
Internal	Qualitatively OK	Low	Weak Supervision

Definitions often become explicit only over time

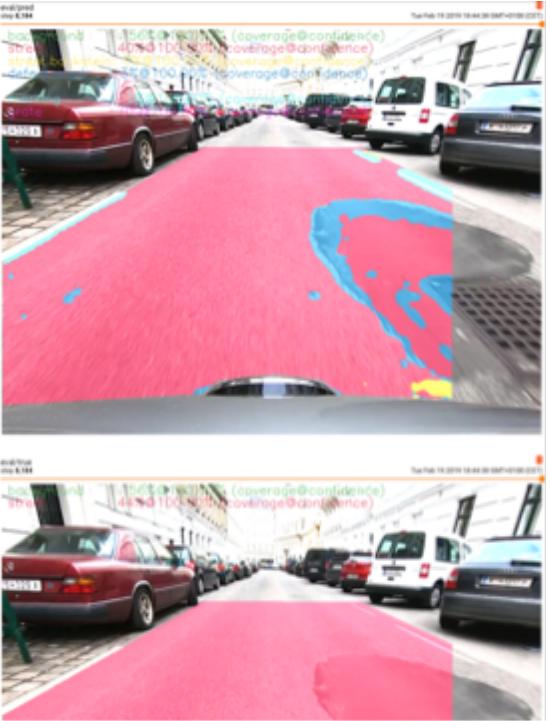
**Models tend to
the mean, but...!**

Use Case:

4



Use Case:



Pred

GT

→ Reserve high-quality Split
→ k-fold

Plug!

<https://app.moonvision.io>

- Multi-User
- Multi-Shape
- Recommendation System
- Free Tier
- -----
- Give us Feedback
- We are hiring