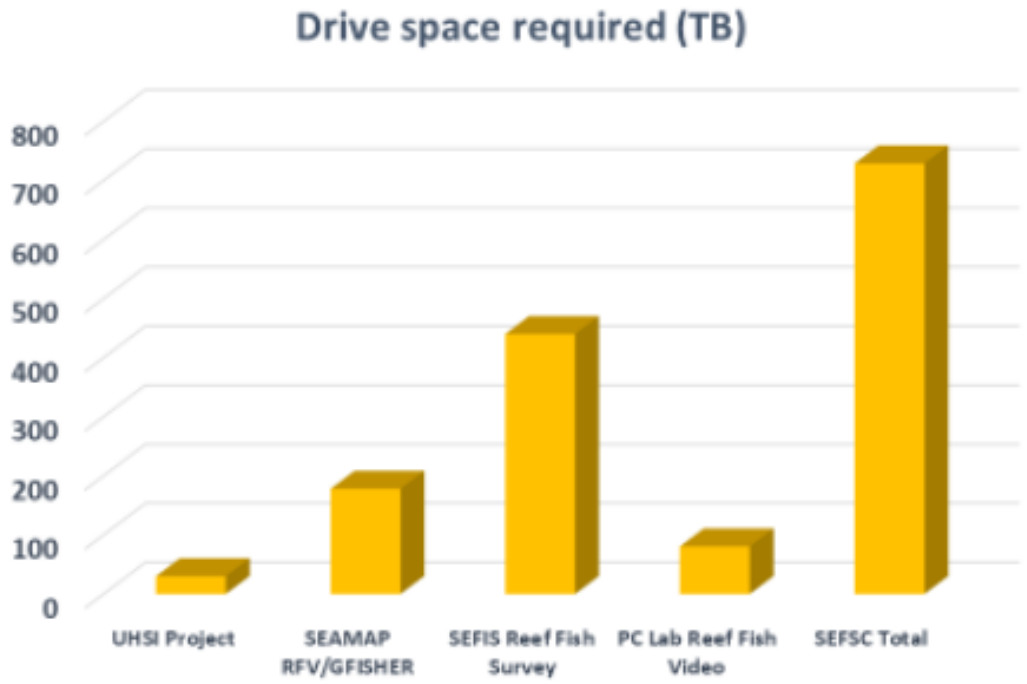
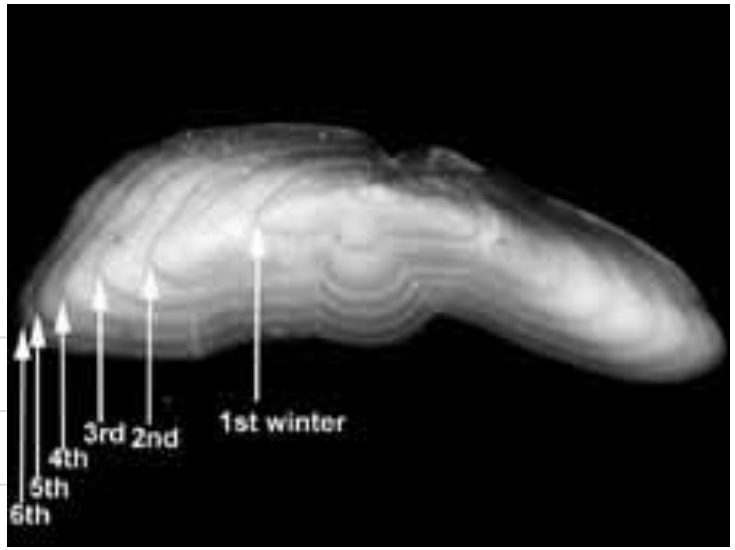
Artificial Intelligence / Machine Learning for Big Data Analytics



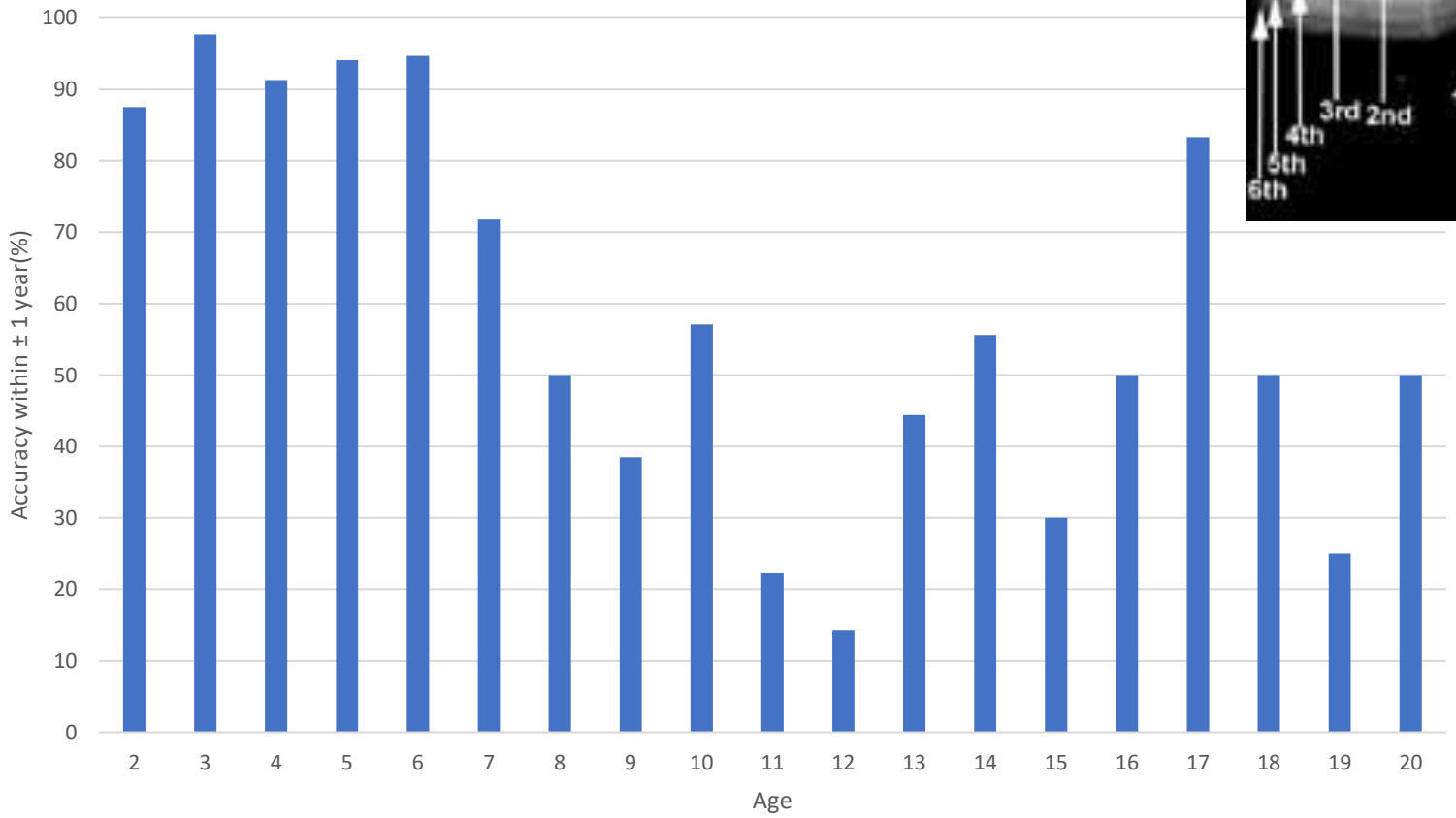
Collecting an additional ~60 TB annually
Commonalities with manual post-processing bottlenecks
Automated post-processing is a necessity

Model Performance on Test Set



Overall Accuracy within ± 1 year:

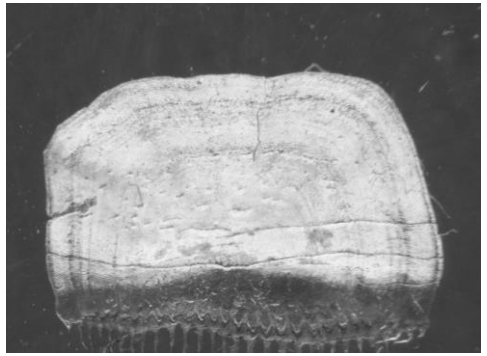
79.4% Red Snapper Classification Accuracy



Menhaden scale aging

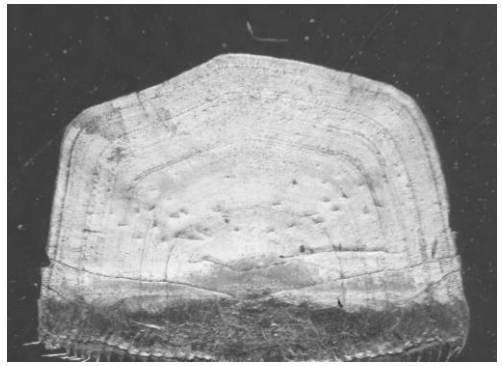
Dataset

- 4199 entries
- 5 classes

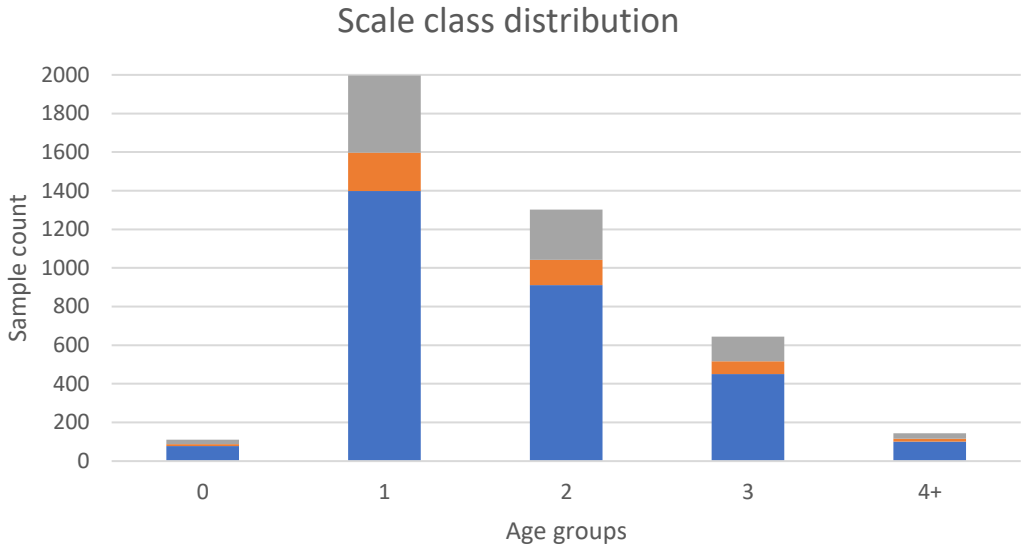


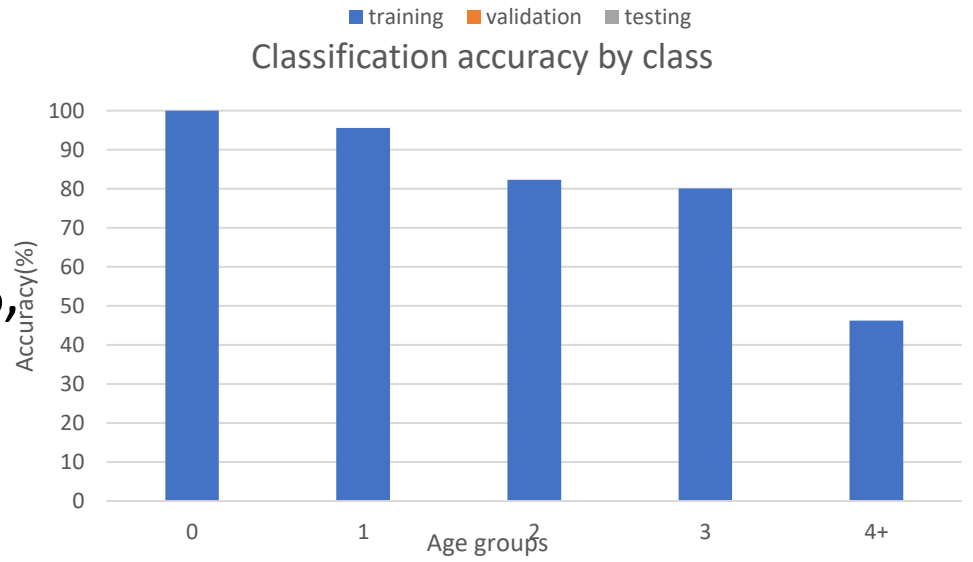
Input

- Image
- Metadata: weight, length, month

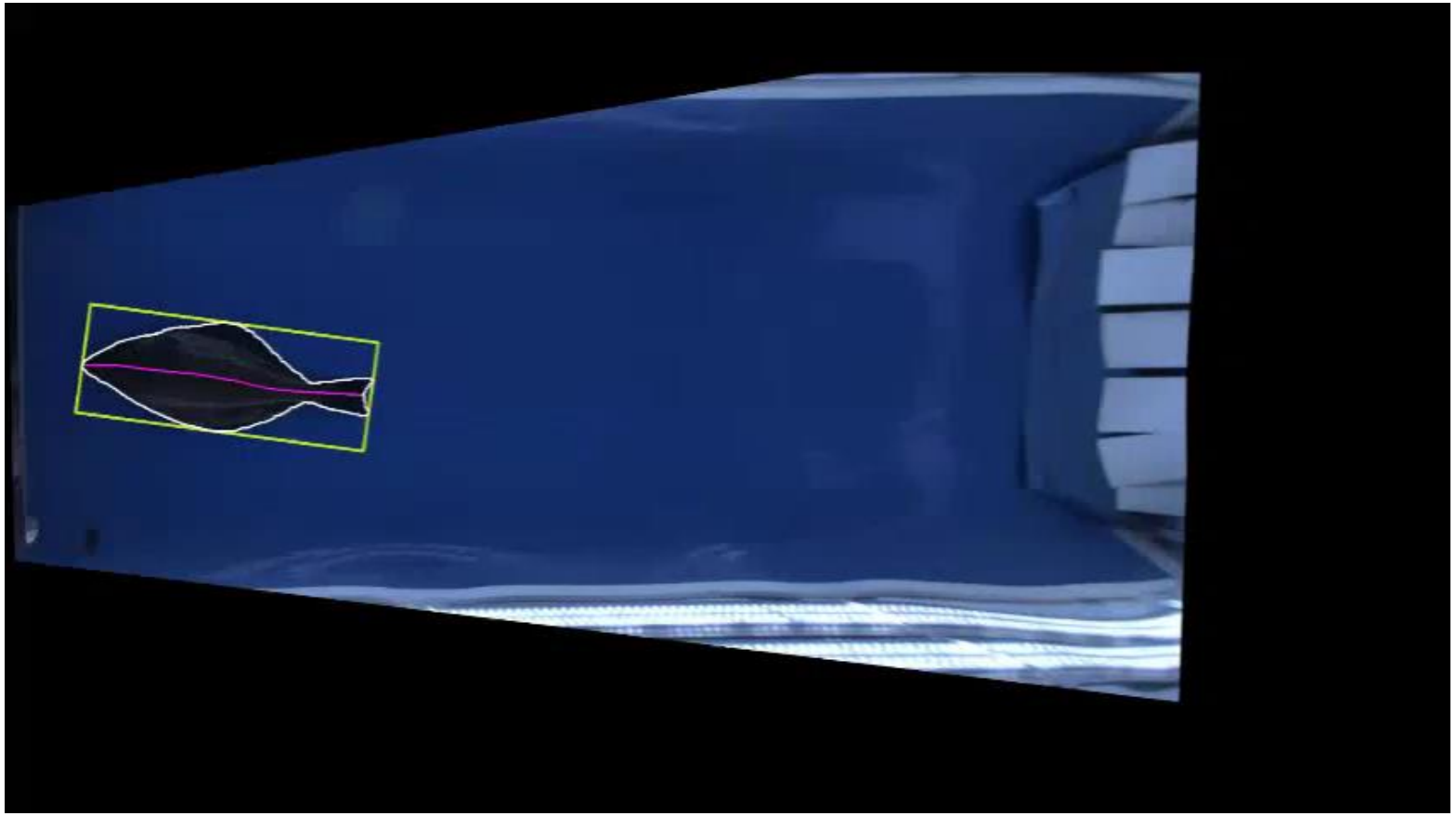


Overall accuracy is **87.3%**, comparable to the **~89%** agreement of human readers



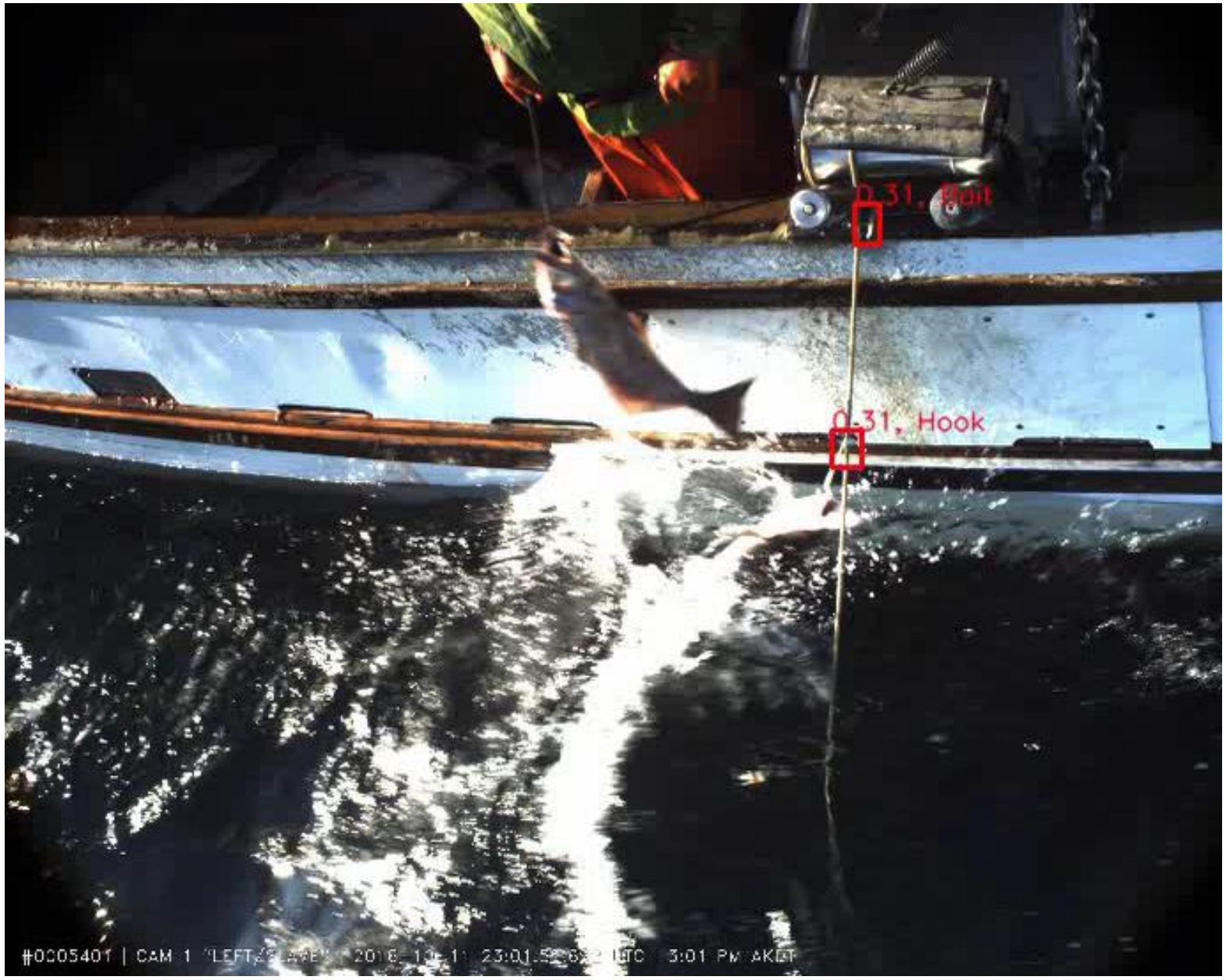


Automation can make expedited release of halibut easier and more practical



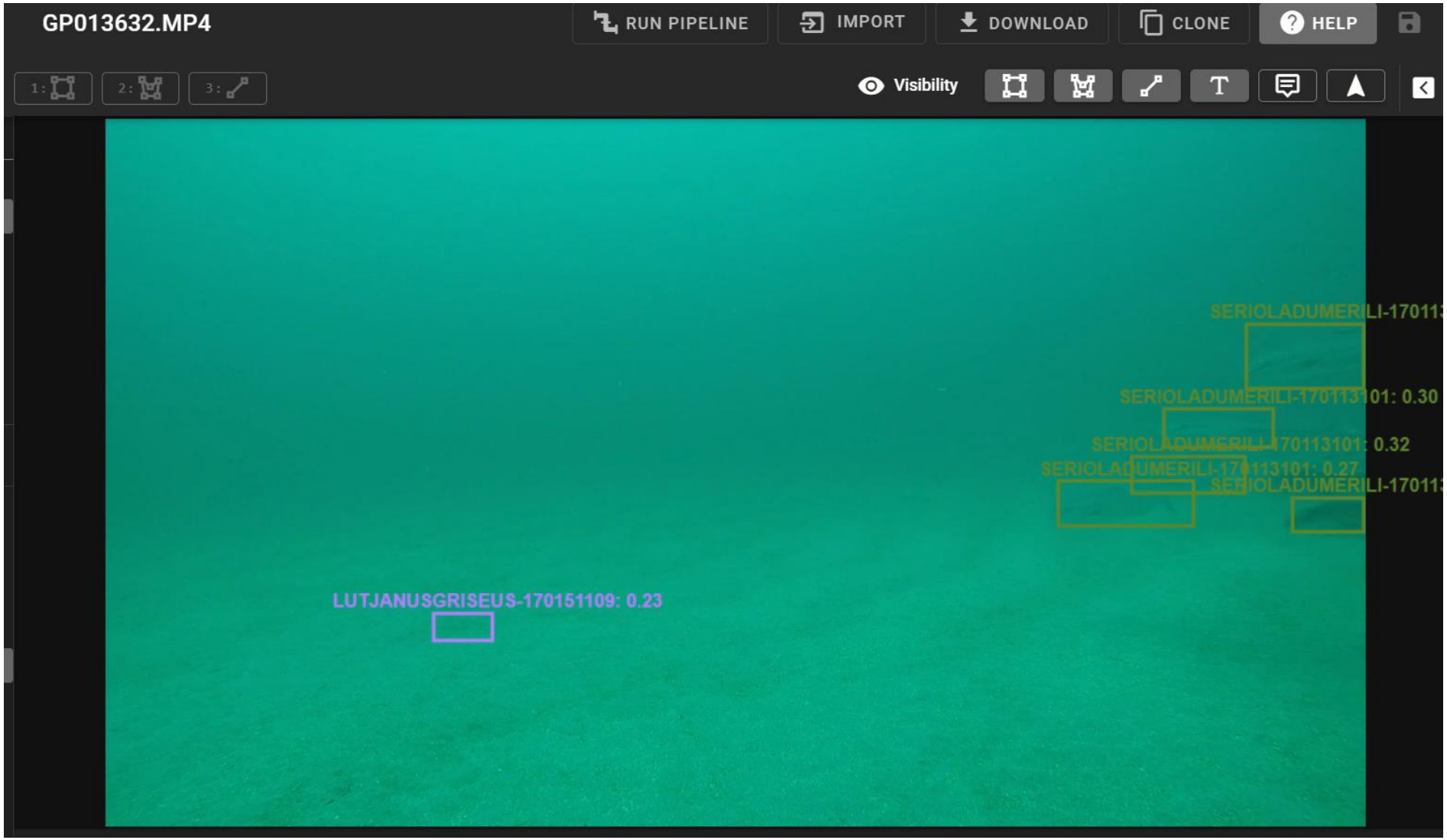
Disposition (Stereo IMS)

Longline Vessels Rail



Gulf of Mexico SEAMAP Survey

Performance on Videos of Varying Difficulty



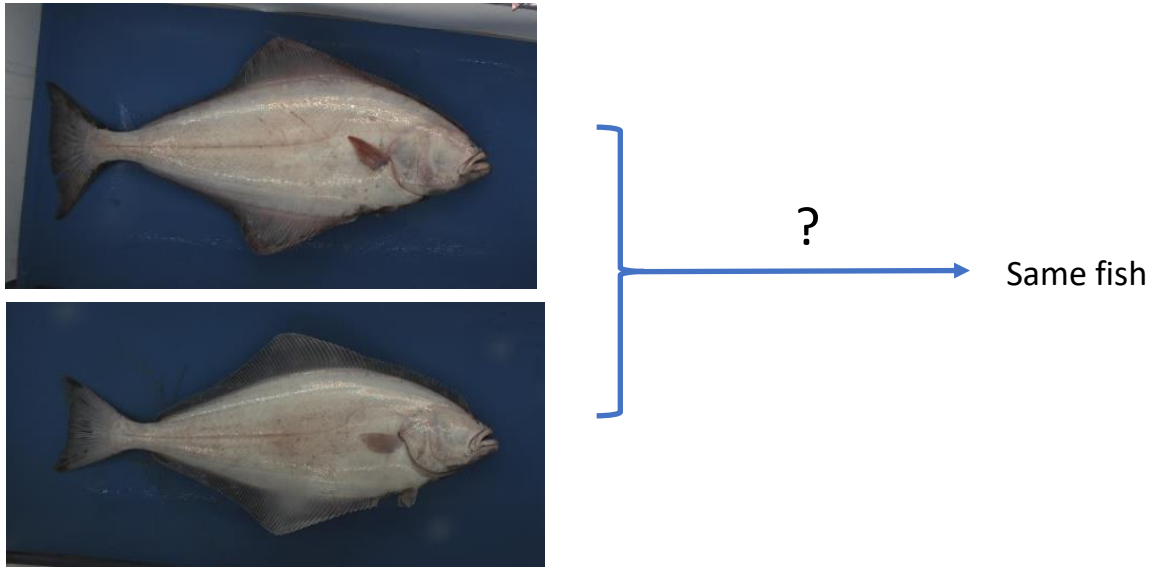
NGI Northern Gulf Institute a NOAA cooperative institute

VIAME Models in Action

Proof of Concept

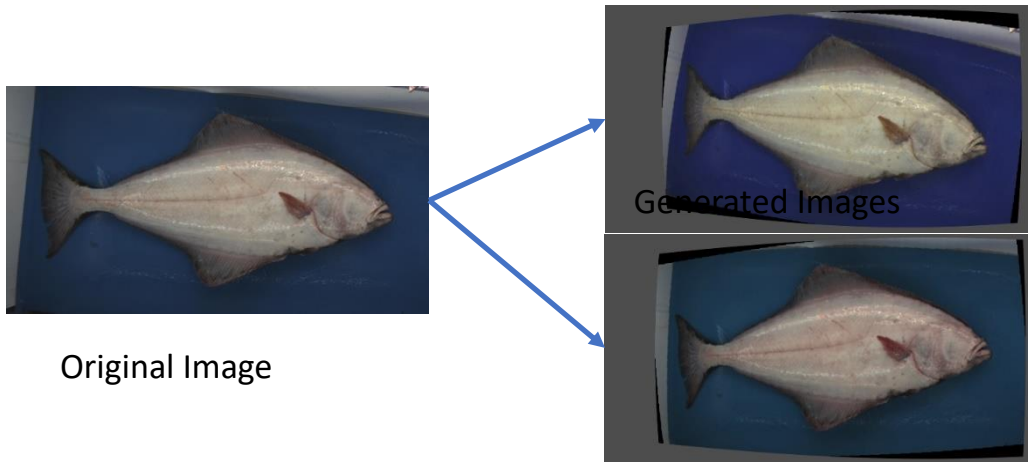
Facial Recognition - Chute IMS

- Goal: identify whether two input images are the same fish.



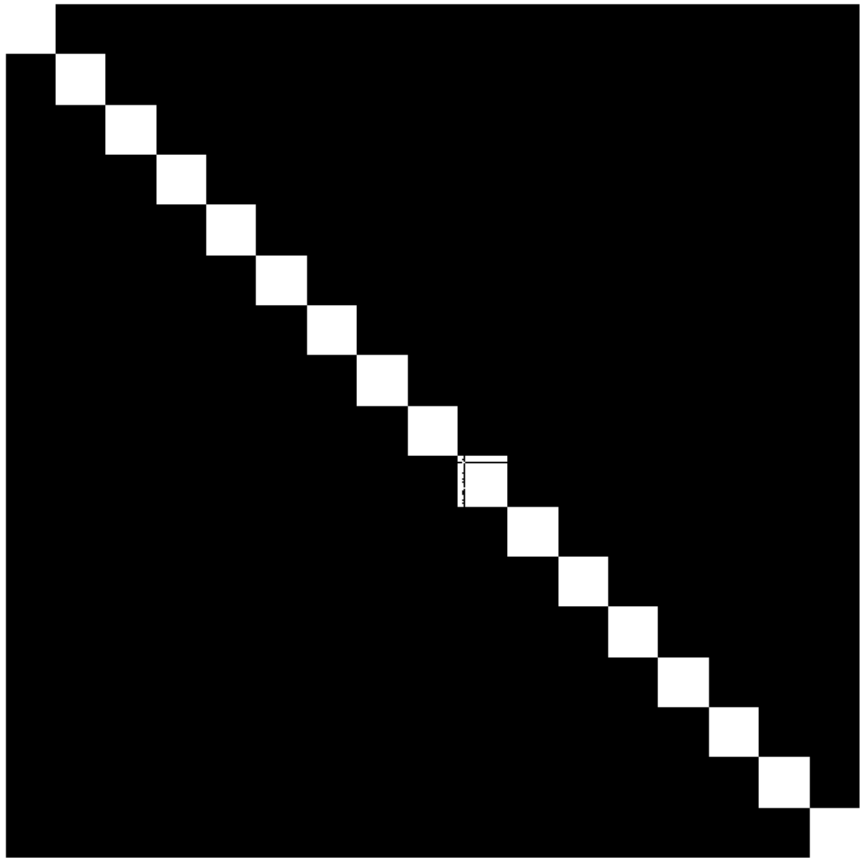
Generate Multiple Fish

- Generate 100 images for each fish.
  - Add random color (HSV color space).
  - Add random rotation (+/-5^o).
  - Add random distortion (barrel distortion).



Proof of Concept

- Set an optimal threshold for the distance matrix D.
  - $\begin{cases} L_{i,j} = 1 \text{ (white)}, D_{i,j} < thresh \\ L_{i,j} = 0 \text{ (black)}, D_{i,j} \geq thresh \end{cases}$
- Accuracy = 99.97 for all combinations (i, j) in the testing set.
- Next Steps?



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