

901221 - Midwater Time Series

Week 51

1. Danelle Cline
 - a. Evaluating pseudo-labels. Classification performance improvement ~ 10% when ambiguous categories, e.g. marine snow and marine organisms removed. Object detection model performance needs improvement.

Week 50

1. Paul Roberts
 - a. Sony FX6 4k120p testing

Week 48

1. Danelle Cline
 - a. Processed two dives with argo kubernetes workflow & loaded tracks into the Tator. No issues other than Danelle's office getting really warm as the 4 GPUs work. Reviewed track results with Rob. Next steps are swapping out the tracker and experimenting with dropped frames to inform the i2MAP recording frame rate.

Week 46

1. Danelle Cline
 - a. Finished training RF-DETR Large model two ways: one with full i2MAP frame size 1920x1080, and the other with 640x640 augmented image crops. Despite the pseudo labels, roughly double the performance when training on augmented crops so this is the likely target for a production pipeline. Rob S to review pseudo

labels next week, then retraining with cleaned labels.



- b. Exploring [Argo](#) with simplified kubernetes for scaled video processing (and image processing).
2. Paul Roberts
 - a. 4k recorder controller schematic capture

Week 44

1. Paul Roberts
 - a. i2MAP deployment and 4k camera upgrades

Week 43

1. Francois Cazenave
 - a. Assembled camera housing for deployment
2. Rich Henthorn
 - a. i2MAP 4K video capture
3. Mike McCann
 - a. Reprocessed i2map data with auv-python as I discovered that last April's processing had failed

Week 42

1. Francois Cazenave
 - a. Inspected and cleaned I2mqp housing

2. Danelle Cline
 - a. Trained new ViTS models with i2MAP and M3 data
 - b. Using REDIS-based vector database system VSS, prepared pseudo labels for training object detector [RF-DETR](#) model.
3. Rich Henthorn
 - a. Spoke with Rob Sherlock about i2MAP 4K camera integration
 - b. 4K camera connected to 2K recorder should not require any CARL updates
 - c. 4K recorder will require some additional switching and probably commands

Week 41

1. Danelle Cline
 - a. Exported i2MAP training data to VOC+COCO format to share with video lab model training
 - b. Retrained i2MAP ViTS classifier

Week 37

1. Paul Roberts
 - a. 4k upgrade, fiber port testing, chassis assembly

Week 36

1. Paul Roberts
 - a. 4k recorder chassis
 - b. 4k interface
 - c. i2MAP modifications

Week 35

1. Francois Cazenave
 - a. Open the i2map camera housing
2. Danelle Cline
 - a. Running cluster load pipeline to add more training data
 - b. Prototyping new tracking pipeline
3. Paul Roberts
 - a. 4k upgrade chassis fixtures
 - b. Fiber port testing

Week 34

1. Paul Roberts
 - a. Recorder housing controller design
 - b. Recorder housing chassis design

Week 33

1. Paul Roberts
 - a. 4k recorder housing fab
 - b. 4k recorder chassis design and i2map upgrades

Week 28

1. Danelle Cline
 - a. Proposal work

Week 27

1. Danelle Cline
 - a. Proposal work
 - b. Downloading i2MAP training data for Kris to Ultralytics format

Week 26

1. Danelle Cline
 - a. Minor exploration of tracking using botsort
2. Kent Headley
 - a. trying to develop on wbs outline for M1 software for different options

Week 24

1. Kent Headley
 - a. Trying to determine what codebase is used for chamber controllers. Bob H indicates is it O5 expander, but the hardware is quite different; it may actually be O4 chamber controller, or it's possible that the O5 firmware works for both.
 - b. Got O4 chamber to build, but could not get the Java Unified Host Bootloader App (UHBA) to work on macOS. So much for "write once, run everywhere"...I was able to run UHBA on a windows machine. I could get UHBA running on macOS only using the Java 1.8 runtime that ships with MPLABX; however, the serial port stuff didn't work. I suspect a combination of old 32-bit JNI code that ships with UHBA and/or purejavacomm serial libraries that it depends on.
 - c. Got some test software for the O5 expander working; it's modbus RTU, so rather painful to debug, but working now.

Week 21

1. Danelle Cline
 - a. Finished processing i2MAP_20250402 300 meter day/night transect with custom YOLO BioTracker strided no tracking
2. Kent Headley

- a. Added a station keeping substack to test mission to make it more like an i2map mission, and fixed a bug that caused a substack not to be activated. The test mission appears to be working in sim, though Matlab has been unavailable, so it hasn't been possible to review the results graphically.

Week 20

1. Mike McCann
 - a. Identified confusing duplicate i2MAP mission log directories in M3/master

Week 19

1. Danelle Cline
 - a. Trained new i2MAP classifier ViTs models for 8,16, and 32 block sizes
 - b. Processed i2MAP_20250402 dive with 1 second 3 stage YOLO + ViT + cluster pipeline and loaded to [mantis](#).
 - c. Processing i2MAP_20250402 300 meter day/night transect with custom YOLO BioTracker strided tracking to compare to 415K YOLOx detection/tracking. Developing a workflow for fast dive summary.
 - d. Discussion about proposal
2. Mike McCann
 - a. Fixes to auv-python following move of i2MAP log files from titan to thalassa
3. Paul Roberts
 - a. Finishing housing drawings, ordering parts
4. Brian Schlining
 - a. More investigations into anomalous transect distance calculations.

Week 17

1. Danelle Cline
 - a. Speed improvements on strided processing pipeline.
 - b. Processing latest spring experiment i2MAP dive with strided + sdcat clustering pipeline. Discussion with Rob Sherlock on reporting requirements
2. Mike McCann
 - a. Gave Rob some STOQS UI tips and communicated what it can't do

Week 16

1. Paul Roberts
 - a. 4k recorder housing design
2. Brian Schlining
 - a. Investigations into issues with Midwater transect volumes.
 - b. Registration of i2MAP videos in our video asset manager

Week 15

1. Paul Roberts
 - a. Testing 4k sdi/fiber converters
 - b. Testing possible coax 12G-SDI options
2. Brian Schlining
 - a. Investigating anomalies in transect volumes for a handful of 1999 ROV deployments.

Week 14

1. Brian Schlining
 - a. Looking into issues with transect volume calculations from ACM data for a few midwater transects from the ROVs.

Week 13

1. Mike McCann
 - a. Pointed Rob to expd.shore.mbari.org's rovctddata endpoint for getting "raw" data
 - b. Discovered that RovctdDataServlet has a "raw" option and showed him how to modify the Matlab script to get that plot
 - c. Why do we have all these different ways to access rovctd data?

Week 12

1. Danelle Cline
 - a. Processed test i2MAP video with revised algorithm using Buffered IOU and reduced detection IOU to reduce track errors.
 - b. Evaluating Argo workflow and updated [ai documentation](#)

Week 11

1. Paul Roberts
 - a. Testing 12G sdi through seacon coax

Week 10

1. Danelle Cline
 - a. Tator upgrade
 - b. ARGO Kubernetes sandbox.
2. Kent Headley
 - a. Reviewed with Erik the implementation of Behavior class feature enabling start/end times to use real time clock.
 - b. Working on transit and low-power station keeping behaviors

Week 9

1. Kent Headley
 - a. Working on new AUV behaviors

Week 8

1. Danelle Cline
 - a. i2MAP ViTS8 model + Megadetect + Biotrack look pretty good. Some track jitter in siphonophores and cydippidas. Going to test with FathomNet Megladon next.

Week 7

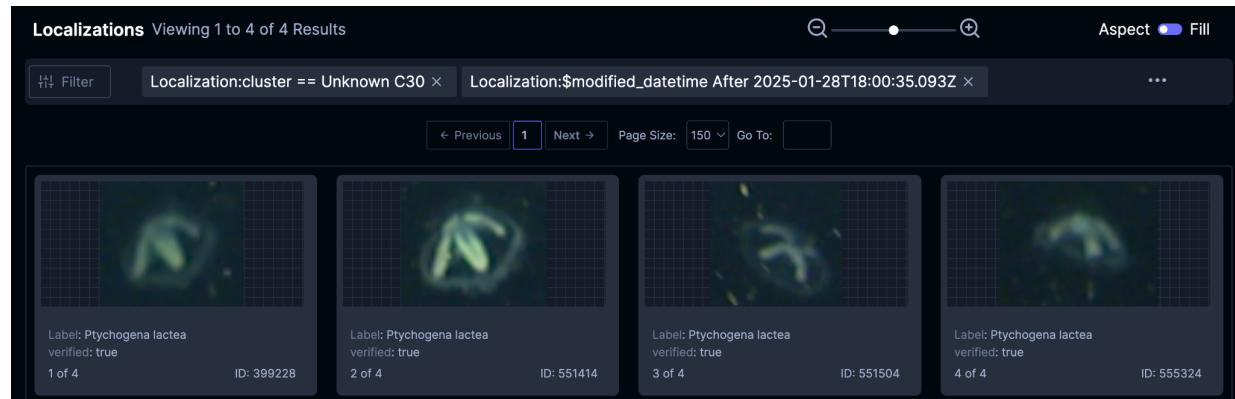
1. Danelle Cline
 - a. Processing single i2MAP video with different models + BioTrack
2. Paul Roberts
 - a. Opening i2MAP housing, swapping fans
 - b. Planning for 4k recorder upgrade

Week 6

1. Danelle Cline
 - a. Nearly complete with improved tracking algorithm changes to [BioTrack](#) code. Combining multiple assignments from Hungarian optimizations is looking very good.
 - b. ViTS classification model trained with additional R.Sherlock labels. .92 top-1 balanced accuracy, 92 classes. Still some minor label clean-up to do. Rob requested retraining megadetector object detector model with removed nectosomes.
2. Kent Headley
 - a. Starting to work on Dorado code changes to Layered Control to support remote mission initiation

Week 5

1. Danelle Cline
 - a. Refactored fastapi-tator
 - b. Loaded ~30K clustered+classified results from ViTS16 model which had better .89 *balanced accuracy* than ViTS8 model of .82 for the 82 concepts(mostly species). Many common species cluster nearly perfectly. Some not in the model have been uncovered, e.g. *Ptychogena lactea*. Because of domain shift, these look different in i2MAP versus ROV so discovery through clustering is proving useful.



c.

d. (mostly) Euchirella bitmumida many poses in a single cluster

Week 4

1. Danelle Cline

- Loaded 200 meter classifications using active learning examples from top-2
- Working with Rob.S to label confused examples. Current model has top-1 balanced accuracy (a better metric for long-tail distributions) of 0.89.

Week 3

1. Danelle Cline

- ViTS model training. .89 top-1 balanced accuracy
- Processed 200 meters with ViTS 8 block model focusing on fish; cluster results look great.