

Engineering Weekly Report 10/27/2022 - 11/3/2022

Executive Council Notes

- The VAA project team trained the best performing model to date, improving the previous trained model precision by 19.2%! This is in no small part due to the herculean efforts to label data over the last few years by Lonny, Giovanna, and Larissa. Job well done! This took about 10 hours on an 8 GPU instance in AWS with a total compute cost of \$280.27. The team is evaluating this model now and integrating it into our workflows for use.

Individual Activities

- Michael Anderson
- Kevin Barnard
 - 200103 - Core CTD Data - MDUC
 - Kept probing into CTD processing issue; negative values generated for O2 cause script to crash
 - 500055 - VARS, M3/RS, DSG
 - Set up CVision AI model server, serving new (benthic + midwater) model trained on MBARI data at <http://prometheus.shore.mbari.org:8082>
 - 902002 - FathomNet
 - Modified Twitter bot to use new model/model server
 - 902204 - Scalable Marine Robotics Foundations
 - Working on stereo camera calibration for Mola AUV
- Francois Cazenave
 - 902106 - Niobicon-Based AUV Docking Development
 - Designing buoy/housings
 - Assembled new dock latch on AUV
 - Overhead
 - Interviewed two candidates for the ME tech position
 - Helped troubleshoot and redesign the flooded FOCE housings
- Danelle Cline
 - 500055 - VARS, M3/RS, DSG
 - [Deployed the new mbari315K model server in AWS](#)
 - 901502 - Soundscape Research and Education
 - Participated in SoundCOOP - Python Sniffers telecon, focused on PyPAM module which is a potential community module for creating standard sound measurements similar to the Manta Matlab system. Signed up for new slack channel OceanObservationData for further discussions.
 - Weekly meeting. Thanks Carlos and Duane for improvements to procedures to monitor the live stream with an external service. Our stream fan club will be so pleased.
 - Working on debugging an issue with blue whale spectrogram color map inversion RGB to BGR which is causing poor model performance.
 - Assisted student Karl Watkins with some feedback on how to evaluate his humpback model designed to work on tiny devices (e.g. Jetson Nano).
 - 901915 - Improving the Impact of MBARI's Data
 - Worked on FathomNet page upgrade; more work to finish user profiles then pass on for team feedback.

- Need to start DeepSea Guide page upgrades.
- 902005 - VARS Annotation Assistance
 - Set up the deepsea-ai python module in our new VAA production subaccount (thanks Kevin G. and Adriana, especially for setting this up!). After patiently waiting for quota to be approved, used this to train the new mbari315K model on an 8 GPU p3.xlarge instance.
 - Tested the new mbari315K model on short 1 second videos per the [instructions](#). Fixed a few bugs. Release notes can be found in the [CHANGELOG](#). Duane is doing further testing with some select dives.
- Duane Edgington
 - 901502 - Soundscape Research and Education
 - Weekly telecon
 - Discussed procedure to report when live stream is down
 - Alexa Ocean Soundscape skill working fine!
 - 901915 - Improving the Impact of MBARI's Data
 - New MBARI web pages task for Soundscape project
 - 902004 - Planktivore
 - Report to Planktivore team on interest in the work raised by fellow plankton folks at the MIW2022 workshop.
 - 902005 - VARS Annotation Assistance
 - Work with Danelle and Carlos on new AWS credentials, login, and on VAA tasks.
 - Overhead
 - Received new computer from IS. Slowly adding applications, and data from backup disk.
 - Restored personal home computer to enable work from home.
 - Out of Office
 - Sick Oct 31. Now back, with negative covid 19 antigen test results. Finally.
- Jon Erickson
- Kevin Gomes
 - 200105 - Core Navigation Data - MDUC
 - Some research into Kongsberg data management system that may be delivered with the Packard and will have a large impact on navproc/logging/etc.
 - More work on Qt as a possible solution for Dataprobe upgrade for new system on Packard.
 - 901009 - CANON
 - More work on Zuma upgrade
 - Taking the opportunity to overhaul a docker compose to help with production deployments.
 - 901602 - Data TAG
 - A bunch of time refreshing my memory on where things are at with the strategic roadmap in preparation for working on the impact section.
 - 901915 - Improving the Impact of MBARI's Data
 - Some back and forth with Visceral about a couple issues with images and with content wider than 8 column layout. They have solutions for each.
 - 902202 - MBARI Cloud Integration Exploration
 - Troubleshooting why the SSO/AD connector stopped working over the weekend. Answer: no clue, and no clue why it started working again. Not very comforting.
 - Out of Office
 - Few sick days last week
 - 11/21-11/23: Vacation
 - 12/19-12/23: Vacation
- Andy Hamilton
- Kent Headley
 - 600034 - Precision Control Technologies for ROVs and AUVs

- Working with Rob and Rich to integrate TRN into the dorado simulator. Set up a VM with MB-System that Rob can use for testing. Chatted with Rich about TRN process synchronization in the simulator loop.
 - Working on ROV TRN processing for Dec ocean imaging cruise
- 902204 - Scalable Marine Robotics Foundations
 - Worked with Bastian M to tested the Gemini sonar with image capture driver, and added a configuration file parser to the code, and done some build cleanup as well.
 - Testing/mob on the Carson for cruise 11/8.
- Overhead
 - Attended hiring committee meeting (DMO AUV tech); pairing w/ Tanner for SE interview section
 - Working on SE hiring process
 - Working on interview questions
 - New release of engineering labor spreadsheet from latest accounting data
- Rich Henthorn
 - Out of Office
 - Oct 24 - 28, WFH
- Brett Hobson
- Scott Jensen
 - Out of Office
 - On leave 10/20-25
- Brent Jones
- Chad Keczy
- Brian Kieft
 - 300082 - DMO Support - Wave Glider
 - Prep for upcoming PIE deployment with Spray
 - 300083 - DMO Support - LRAUV
 - Discussing plans for boatless deployment for Daphne
 - 708168 - DHS/LRAUV Under-Ice
 - Met with team to discuss upcoming tasks for Stella deployment next week
 - 902102 - Multi-LRAUV Simulation Environment
 - Lots of work trying to get the system built/installed. Almost there but still some hurdles.
 - Met with team to discuss plan for easy rollout (e.g. simple script that handles everything). Working on optimizing uptake.
 - 902106 - Niobicon-Based AUV Docking Development
 - Working with Rob on data analysis for docking
 - Also component/behavior questions
 - Integrating docking arm actuator. Base class changes have been completed. Now working on component integration
 - Met with Francois on Tue to dial in physical limits
 - Overhead
 - Lots of travel expense report overhead
 - Out of Office
 - 10/24 - 10/28 (PDT)
 - 11/21 - 11/25 (MST)
 - 12/28-30 (PST)
- Denis Klimov
- Eric Martin
- Thom Maughan
 - 901009 - CANON

- Met with Kobun to review specs for eDNA workflow server. Gathered quotes and am working with the vendor to get the most bang for the buck.
- 901805 - Coastal Biogeochemical Sensing Program
 - Working on nanoFET instrument driver for MFET. Hit a snag on electrical mod for output voltage from MFET to drive nanoFET. Ordered a small boost converter.
 - In progress on experiment duty cycle statemachine.
- 902004 - Planktivore
 - Jon held design review for Planktivore Rev 2 housing. Gave feedback and approval to move forward with fab.
 - Weights for internal components. Also sent a prelim camera controller solid model to Jon.
 - In progress on camera controller update for Rev 2 housing. Buck-boost converter daughter card, boost v1.0, pcb was stuffed and with a couple of blue wires was functioning. Tested at 6v to 48v input, with 12v 4amp output. Updated the design to fix the probs, added additional copper, sent out for fab. Moving forward with the rest of the camera controller design.
- Overhead
 - Techfest for Jared and Emily
- Out of Office
 - Nov. 14 - 16 Colorado
 - Dec 22 - 28 Colorado
- Mike McCann
 - 901910 - Plankton Taxonomic Groups from AUVs
 - Added QC metadata notes for all Diamon missions
 - Using that metadata to load stoqs_mb_diamonds database
 - Overhead
 - Met with Brian to show where processed i2map data is and to talk about ROV Nav editing
 - Out of Office
 - Shifting work schedule to remotely attend the Web 3D Conference in Paris
- Rob McEwen
- Paul McGill
 - 300070 - DMO Support - Ventana
 - Started documenting recent calculations to determine why Ventana's hydraulic system was overheating
 - 901618 - Pelagic-Benthic Coupling and the Carbon Cycle
 - Made movies from camera tripod time-lapse images
 - Wrote code to analyze time-lapse images and determine when one or both strobes failed to fire
 - Analyzed failure in Dual Camera Tripod near-field camera
 - Worked on refining Laser Measure code to reduce errors
 - Preparing Squirty hardware for shipment to New Zealand
 - 901904 - Deep-Sea Coral-Sponge Community Observatory
 - Reviewed images from most recent Macro camera deployment
- Tom O'Reilly
- Doug Pargett
 - Out of Office
 - August vacation
- Mike Risi
 - Out of Office
 - May 5 - vacation
 - May 9-10 - vacation
 - June 2-8 - OI cruise
 - June 10-14 - vacation

- June 20-22 - vacation
 - July 19-20 - vacation
 - August 8-9 - out of office
 - Out of office most Fridays
- Paul Roberts
 - Out of Office
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- Brent Roman
 - 708179 - Saildrone AK
 - It's back and looks good. Working with Preston to replicate some transient failures we saw during the transit. Suspect these were due to sudden pitching or rolling of Surveyor in storms.
 - 708165 - NOAA-MERHAB
 - Investigating transient failures due to trying to step back in time a few tenths of seconds.
 - 901205 - SURF Center
 - Meet with crew to discuss "Readi-Net"
 - Much of the trouble I'd been having with ESP gateway firmware rewrite appears to have been due to early serial interrupts from Linux host during gateway initialization. Latest version seems solid. Bill Ussler is set to test it.
 - 901913 - WetWiFi
 - Load agreements in place, money allocated, Vehicles supposedly available for early December test. Fingers crossed...
- Carlos Rueda
 - 901009 - CANON
 - (not reported past week) Met with Kevin and Tom for a general [MXM status update](#). In short, good progress on the prototype implementation; additional components being incorporated in the data model; and, per prior discussion with Erik T., potential inclusion of Dorado as one other *prototype provider* to help test and refine the MXM concept next year while also demonstrating benefit for Dorado and other possible systems.
 - Refined the [MXM Service REST API for Providers](#).
 - 901502 - Soundscape Research and Education
 - Upon exchanges with the team, I added <https://shoutcast.mbari.org/pacific-soundscape> to my list of monitored sites by StatusCake (with John, Duane, Danelle and myself as contact group for notification purposes).
 - Participated in SoundCOOP - Python Sniffers telecon, focused on PyPAM and Manta.
 - Thanks John for stopping by and the productive discussion.
 - Looking into [xarray](#) as part of ongoing collaboration with the PyPAM team. Thanks Mike M. for sharing his insights with us.
 - 901513 - Targeted Sampling by Autonomous Underwater Vehicles
 - A very productive set of tests -mainly involving commanding- on the SMC-2 on an actual wave glider was performed. Did several code adjustments to accommodate idiosyncrasies when issuing such commands onboard (as opposed to being issued from shore or directly on WGMS). Many thanks to Tom for his insights. Data access was the only key operation that we could not test due to lack of appropriate configuration. Hoping to test this next time (around thanksgiving?), if possible also along with overall exercising of the tracking algorithms.
 - 901915 - Improving the Impact of MBARI's Data
 - (not reported past week) Did adjustments to my assigned web pages for the new MBARI site.
 - 902005 - VARS Annotation Assistance
 - AWS working session with Danelle and Duane.

- Setting up the ReID code on AWS has proved difficult but I was able to have it in place on my computer, where I'm able to run the training exercises. Thanks Danelle for your assistance. Now looking into understanding the input specs to then train it on our image/video data.
 - 902009 - AUV User Experience Design
 - Delineating some tentative approach for pending API adjustments while the team is able to meet again and/or provide insights in the issues at GitHub.
 - Out of Office
 - Nov 11–14, 23–28, Dec 8–9: vacation
- Karen Salamy
 - Out of Office
 - Vacation: October 19-20, 2022
 - Vacation: November 8-11, 2022
- Brian Schlining
 - 500055 - VARS, M3/RS, DSG
 - Ongoing Iron Mountain video ingest tasks
 - [Fixed](#) misnamed framegrab directories.
 - Fixed time issues for a number of imported videos in VARS
 - [Working on integrating image ML endpoint](#) into VARS
 - 901221 - Midwater Time Series
 - Generated transect volume reports for all midwater transect dives
 - Chatted with Mike McCann about [accessing processed i2MAP data](#). Starting work on merging that AUV data with VARS annotations.
 - 901618 - Pelagic-Benthic Coupling and the Carbon Cycle
 - Working on request for changes on how images are registered in VARS
 - 902002 - FathomNet
 - Investigated how to track funders for submitted data sets
 - Run tests with yolov5 with 33k and new 315k models.
 - For the ocean vision AI games([here](#), [here](#), and [here](#)), [investigated issues](#) with logging a users game results
 - [Continuing workarounds](#) for VARS to FathomNet sync to deal with major one-time import from ML proposals.
 - 902005 - VARS Annotation Assistance
 - Running tests against Paul Roger's video player project (replacement for Sharktopoda/Cthulu). [#1](#), [#2](#)
 - Meets with Paul to discuss video player development
 - Overhead
 - Investigating ongoing [bug](#) that [DARC](#) is encountering in VARS
 - Looking into venues for possibly hosting the next Marine Imaging Workshop (2024 or 2025)
 - The Cookie break app is long dead as the tools to build it don't actually exist anymore. Started putting together a [new one](#).
 - On Su, M, Tu, and Wed, attending a remote imaging workshop hosted by CSIRO/Ifremer
- Alana Sherman
 - 901618 - Pelagic-Benthic Coupling and the Carbon Cycle
 - Wrote matlab script to determine if any of the respirometry data came through
 - 901904 - Deep-Sea Coral-Sponge Community Observatory
 - The Macro was ready to go out last week but was weathered out. New deployment date is Nov 14.
 - 902208 - MiniROV Operations
 - Getting the schedule in order- talking with the Aquarium, as well as Katija, Rock, and Troni
 - End of the year spending decisions

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- Overhead
 - HR issues
 - Hiring efforts on the EE hire