500055 - VARS, M3/RS, DSG

Week 51

1. Duane Edgington
    a. Updated team at last VL meeting

Week 50

1. Kevin Barnard
    a. Continued working on VARS GridView. Finished implementing:
        i. Packaging configuration with Apple code signing and notarization (thanks Joe!)
        ii. Show all, show verified, show unverified toggles
        iii. Bring Sharktopoda video player window top-level on open
        iv. Maintain sort order across updates
        v. Sort by bounding box proposal confidence
    b. Experimented with visual similarity indices, image hash-based clustering
2. Duane Edgington
    a. Team meeting Dec 13, 2023
    b. Reported on VARS-ML-SE tasks
    c. Discussed task assignment with project manager
3. Brian Schlining
    a. On going support for DSG, VARS
        i. https://github.com/mbari-org/vars-annotation/issues/168
        ii. https://github.com/mbari-org/vars-feedback/issues/84

Week 49

1. Kevin Barnard
    a. Implemented several features for VARS GridView
        i. Image caching
        ii. Sharktopoda 2 bounding box scaling
        iii. Visual improvements to grid view ROI widgets
        iv. Split label behavior into label, verify, unverify
        v. Arrow key grid view controls
        vi. VARS observer in image details
        vii. Side taskbar
        viii. Bring Sharktopoda 2 video windows top-level on open
        ix. Sort by verifier
        x. Customization of selection highlight colors
        xi. Map concepts to VARS KB primary names
    b. Resolved issue with FreeTDS bug in TDS 7.3 datetime2 parsing
    c. Started planning features for 2024 VARS GridView rewrite

Week 48

1. Brian Schlining
    a. Shout out to Kevin Barnard for setting up Uptime Kuma for system monitoring. http://rocinante.shore.mbari.org:3001/status/m3-prod

Week 46

1. Kevin Barnard
    a. Assisted with Marimba software development at CSIRO
    b. Investigated reported issue about VARS observer changing via VARS GridView
    c. Several fixes & improvements to VARS GridView
        i. Fix issue of framegrab bounding boxes using video
        ii. Autorange image view only on image change
        iii. Apply default chronological sort
        iv. Add icons for “open settings” and “query” actions
        v. Sharktopoda 2 integration working
2. Duane Edgington
    a. Completed assigned tasks on VARS-ML-Tasklist including production runs on VM DORIS to shake out bugs and deliver processed video files to Lonny.
    b. Working session with Danelle to refactor directories on Doris to make it easy for different projects to keep their work and products separate on DORIS. Updating documentation.
3. Brian Schlining
    a. Fixed an issue with viewing raw ML output in Sharktopoda where data sets with 100,000s of localizations would hang.
    b. Rewrote the ML loader, then loaded ML-generated annotations for dive V4464 into VARS.
    c. Fixed the map base layer used in the prototype Deep-sea Guide. ESRI retired the old one and turned it off.
    d. Investigating methods of using full ML track data to help annotators visualize and correct annotations.
    e. Added basic documentation for Sharktopoda, and vcr4j-remote.
    f. Switching doc generator to scaladoc for raziel and m3-support

Week 45

1. Kevin Barnard
    a. Fixed VARS GridView issue with bounding boxes on framegrabs re-capturing frame from video
    b. Sorted out video/image reference association in VARS GridView
2. Duane Edgington
    a. Continued testing/tuning production system on DORIS for launching/monitoring AWS inference jobs. 3 recent dives identified by Lonny have been processed, now to completion. Working through CDK stack behavior tuning.
    b. Team meeting
3. Brian Schlining
    a. Working on a permanent archive for one off machine learning runs on video. Set up a plutus instance to archive output from the local ML service; both of which are running on maximilian (a GPU box). ATM, ML output will be stored in titan:/DeepSea-AIs
    b. Added code to allow for more types of filters when viewing ML output in Sharktopoda.

Week 44

1. Duane Edgington
    a. Development and testing of deepsea-ai docker image on VM DORIS continues. Testing with production-level dive video Ventana 2023. Issues being worked on.
    b. MBARI GPU meeting Nov 1 with IS team.
2. Brian Schlining
    a. Create apps to view ML localizations directly in Sharktopoda for different use cases including: view all, filter by confidence, view as loaded into vars. Source code is at:
        i. https://github.com/mbari-org/m3-support/tree/main/src/main/scala/org/mbari/m3/support/apps/mlviz

ii. https://github.com/mbari-org/m3-support/tree/main/src/main/scala/org/mbari/m3/support/etc/yolo

Week 43

1. Duane Edgington
    a. Continued work on VARS-ML-SE-tasks, focused on preparing VM DORIS as host for launching deepsea-ai commands (including ecsprocess)
2. Brian Schlining
    a. Upgraded Charybdis from helidon 3 to 4
    b. Updated Raziel to accommodate changes to charybdis
    c. More testing comparing framecapture/seek time using ffmeg vs sharktopoda. Getting identical results is a critical feature for machine learning training.

Week 42

1. Kevin Barnard
    a. Began overhaul of VARS GridView querying/object graph management
2. Brian Schlining
    a. New release of Sharktopoda video player that addresses issues #50 and #56 that deal with differences in frame number interpretation between ffmpeg and sharktopoda.
    b. Wrote a fix for issue #63 to sync i2MAP master and mezzanine video timestamps.

Week 41

1. Duane Edgington
    a. Continued work on VARS-ML-SE tasks. Working on deepsea-ai docker service on Doris VM. Testing on digits dev box.
2. Brian Schlining
    a. Investigating bulk edit/update performance issues with annosaurus. Starting heavy lift from eclipselink to hibernate. Will also be adding hibernate envers for history change tracking.
    b. Started prototype to aggregate i2MAP master and mezzanine files which are offset by 1 second.

Week 40

1. Kevin Barnard
    a. Implementing handling of different-resolution source video (i.e., rescaling) in m3-download dataset generation
2. Duane Edgington
    a. Continued work on VARS-ML-SE tasks. Finished testing of flags/parameters AWS. Finished testing of handling/logging upload failure from M3 (network hiccup). With Danelle, finished testing of docker cuda service on Olivia local machine.
    b. With IS, brought workstation Maximilian up for cuda/ML work, deployed to Brian S. office, with 10G ethernet networking. Nvida RTX A4000 GPU with cuda/pytorch/docker/AWS stack.
    c. MBARI VM doris being brought up for deepsea-ai (dsai) AWS job launching.
3. Brian Schlining
    a. Investigating performance issues with bulk updates made to annotations (See annosaurus)
    b. Met with Paul Rogers to discuss differences in seek time into a video between ffmpeg and sharktopoda. This is a key issue to resolve for the machine learning pipelines.
    c. IS setup a new GPU box for our group to use for local ML video processing.

Week 39

1. Kevin Barnard

    a. Fixed IPv4/IPv6 UDP socket issue in Sharktopoda client library
    b. Implemented feature requests in VARS GridView
        i. Handle annotations made on different-resolution source video
        ii. Refit image detail view on ROI selection change
2. Duane Edgington
    a. Continued work on VARS-ML-SE tasks. Finished testing of flags/parameters AWS. With Danelle, testing of docker service on Olivia local machine.
3. Brian Schlining
    a. Looking into dropping use of web frameworks for front end development of the DSG. Doing testing and research using web components, and straight javascript/html/css.
    b. Iron Mountain video imports. We're almost done!!!! Except for a few problem tapes, all ROV video tapes have been converted to video files and registered in our video asset manager.

Week 38

1. Kevin Barnard
    a. Added pass-through for confidence field from ML inference to VARS bounding boxes
2. Duane Edgington
    a. Continued testing deepsea-ai process and ecsprocess ml inference updates.
    b. Worked on tasks as assigned VARS-ML-SE-tasks

Week 37

1. Kevin Barnard
    a. Resolved question of off-image bounding boxes in VARS
2. Duane Edgington
    a. Continued testing of enhancements to deepsea-ai
3. Kent Headley
    a. Tested (w/ Brian S) and merged changes for libbmagic Linux build and SDK update
4. Brian Schlining
    a. Completed audit of existing and new data embargoes. Applied the embargoes to FathomNet as well as the external DSG and KB and cleaned up any escapees.
    b. Starting working with Paul Rogers to address issues with video frame alignment in Sharktopoda. This is needed for the video lab's machine learning/human-in-the-loop workflows.
    c. Ran a sanity check with Kent Headley's latest changes to libbmagic against the 4k camera on the RC.

Week 36

1. Duane Edgington
    a. Continued work on VARS-ML-SE-tasks action items, and testing
    b. Team meeting Aug 30
2. Kent Headley
    a. meet w/ Brian Schliniing to test updates to BlackMagic video capture drivers
3. Brian Schlining
    a. Still working through embargo issues
    b. Iron Mountain video imports

Week 35

1. Kevin Barnard
    a. Rolled out several VARS GridView feature requests
    b. Continued integration of VARS GridView with Sharktopoda 2
2. Duane Edgington

    a. Testing/debug updates to deepsea-ai process command
    b. Team meeting Aug 30
3. Brian Schlining
    a. Reviewing changes to external data embargoes and implementing them.
    b. Iron Mountain video imports. We're almost done!!!!

Week 34

1. Kevin Barnard
    a. Completed and released VARS GridView feature requests
        i. Sort by multiple values
        ii. Delete observations with localizations
        iii. Setting for font size
        iv. Context menu in image pane
        v. Click to select box from image pane
        vi. Drag-select localizations from grid view
    b. Investigated changing observer when box changes → not the case
    c. Continued integration of VARS GridView with Sharktopoda 2
    d. Remapped embargoed concepts in mbari315k_yolov8 model for public release
2. Duane Edgington
    a. Working on VARS-ML pipeline worksheet action items and testing

Week 33

1. Kevin Barnard
    a. Investigating "vars-part-ingest" bounding box quality in VARS
    b. Implemented feature requests for VARS GridView
2. Duane Edgington
    a. Preparation for the next meeting August 23. Reviewing action items; preparation for the next round of model training and dive inference.
    b. Working on fix for issue renewing training from checkpoint (device out of space error)
3. Mike McCann
    a. Adjust regex in vfbydive to parse new naming using fractional seconds for framegrabs

Week 32

1. Kent Headley
    a. Libbmagic linux build ready to test, pending access
2. Brian Schlining
    a. Iron Mountain Video Imports
    b. Meeting with Visceral to discuss deep-sea guide redesign
    c. Investigating time misalignments between ffmpeg and sharktopoda.
    d. Prototyping ideas for new VARS query web application

Week 31

1. Kevin Barnard
    a. Released VARS GridView changes
        i. Query on bounding box association JSON fields
        ii. Sort on multiple fields
2. Kent Headley
    a. Attempting linux build

Week 30

1. Kevin Barnard
    a. Made some progress on time synchronization issue
2. Kent Headley
    a. VARS users reported long processing times (12-15s) for 4k frame grabs (FG). Brian Schlining did some testing and found the issue to be somewhere in the frame grab server, which I maintain. I made some diagnostic updates and we isolated the issue to the ImageMagick library. It turns out that the PNG image format can have particularly long write times. After experimented with some operations that affect compression and storage size, we found a good balance between size and speed, ~11MB and 750 ms.
    b. Libbmagic updates: Added support for new BlackMagic SDK, added support for GraphicksMagick builds (alternative to ImageMagick), added configuration option to set quality at run-time

Week 29

1. Kevin Barnard
    a. Implementing several features requested by VL into VARS GridView
2. Brian Schlining
    a. Continuing investigation of subtle framegrab/bounding box misalignments from different framecapture methods at mbari-org/vars-feedback#56.
    b. We continue to be plagued by slow 4k framecapture on ships. Investigating at https://github.com/mbari-org/vars-feedback/issues/58.
    c. Proposed a spec for very simple web services to process video files using volov5.

Week 28

1. Kevin Barnard
    a. Investigated timestamp difference between Sharktopoda 2 and Beholder
    b. Added query filters for observation activity and group
    c. Implemented multiple sort
2. Duane Edgington
    a. Proposal work
    b. Team meetings
3. Brian Schlining
    a. Updated framecapture software on the Rachel Carson for the newly installed 4k Camera.
    b. Upgraded VARS and all services on the Rachel Carson to better support the large 4k framegrabs which can be slow to capture.
    c. Started working on spec for web services to be used to apply ML to individual video files.
    d. Putting together code to probe this issue (#56) where different methods of framecapture return slightly different frames from the video. This is causing issues with ML bounding boxes being misaligned on images.

Week 27

1. Duane Edgington
    a. Proposal work. Reviewing documentation on model training.

Week 26

1. Kevin Barnard
    a. Implemented support for video frame localizations (i.e., without a framegrab) in m3-download for next training run

    b. Continued integration of Sharktopoda 2 and VARS GridView
2. Duane Edgington
    a. Team meeting, proposal process.
3. Brian Schlining
    a. Iron Mountain video imports
    b. Investigating bounding box mis-alignments on ML generated proposals.

Week 25

1. Brian Schlining
    a. Iron Mountain video imports

Week 24

1. Kevin Barnard
    a. Several upgrades to vars-gridview
    b. Wrote sharktopoda-client-py for Sharktopoda 2 UDP controls
    c. Added group and activity filtering capabilities to m3-download
    d. Investigated reported issue of vars-gridview changing observation fields
2. Duane Edgington
    a. Met with project manager NancyJ to go over my roles and responsibilities on project 2023. Added to biweekly project team meetings.
3. Brian Schlining
    a. Tweaked the M3 NGINX proxy server to display README files in directory listings. Added README's to all top level directories. This was needed as some scientists were unknowingly recalling many, many ProRes files from LTO by browsing to them through the web. See http://m3.shore.mbari.org/videos/M3/master/.

Week 23

1. Kevin Barnard
    a. Implemented Python client for Sharktopoda 2 video player, to support VARS GridView integration

Week 22

1. Kevin Barnard
    a. Discussed ML/DSG priorities
    b. Scoped features for vars-gridview to aid in ML workflow

Week 21

1. Kevin Barnard
    a. Working on vars-kb-server rewrite
    b. Scoped integration of clearvision/imagehash capabilities into vars-gridview

Week 18

1. Kevin Barnard
    a. Started reimplementing vars-kb-server in Scala 3, standalone from vars-kb core
2. Brian Schlining
    a. Iron Mountain video imports

Week 17

1. Kevin Barnard
    a. Started scoping DSG overhaul, knowledge base server/client
2. Brian Schlining
    a. Started working on the new DSG again. At this point, I'm mostly translating existing code used in the demo at http://m3.shore.mbari.org/deepseaguide/ from Vue 2 to Vue 3. (Vue 2 reaches its end of life this year)

Week 15

1. Brian Schlining
    a. Iron Mountain video imports
    b. Closed out contract with Paul Rogers for Sharktopoda development.

Week 14

1. Brian Schlining
    a. Working off some technical debt on the vampire-squid microservice (MBARI's video asset manager)
    b. Iron Mountain video imports
    c. Worked with Neil to troubleshoot disk issues on our database server, Perseus

Week 13

1. Kevin Barnard
    a. Fixed open video from vars-gridview
    b. Fixed loading of ML-generated annotations in vars-gridview
2. Brian Schlining
    a. Refactoring vampire-squid to remove some technical debt. (it's about seven years old now)

Week 12

1. Kent Headley
    a. Worked with Brian Schlning to resolve segfault encountered while integrating black magic image capture featue on VARS with MiniROV, Root cause appears to be an issue in the latest version of ImageMagick library on macOS Ventura; Wrote an independent/minimal test to confirm this (pending), but meanwhile, the previous version of the library is working.
2. Brian Schlining
    a. Resolved some issues with a large machine learning data import into VARS.
    b. Iron Mountain video imports
    c. Set up Pythia, a new machine learning inference service internally and externally. Brian also released Pythia as open source. Pythia is integrated into VARS.
    d. Upgraded VARS on the Mini ROV. Worked with Kent Headley to sort out a new seg fault with the framecapture server.
    e. Ran integration testing on the new SQL Server 2022 servers, Venus and Rhea, to verify that existing applications and services work with the server upgrades.

Week 11

1. Kevin Barnard
    a. Validated class list for 315k model
2. Danelle Cline
    a. Python package deepsea-ai documentation updates and a minor bug fix to support verifying previously processed videos. Recomputing missing videos from a last large batch job.

3. Duane Edgington
    a. Explored why some videos from dive D1377 did not load in Lonny's giant January AWS ECS submission.By carefully examining the AWS cloudwatch logs I determined that the missing videos were not successfully uploaded to AWS S3. We don't know if that was due to a titan issue, or networking issue, or other. Issue posted to github to improve feedback/logging of video submissions and processing status in deepsea-ai portal.
    b. Ran a job with Danelle to resubmit dive D1377 and monitor successful completion and loading of missing video data into deepsea-ai. So far so good. It should be completed by the end of March 15.
4. Brian Schlining
    a. There's a new share at titan:/M3_ML for archiving machine learning models used for analysis by the video lab.
    b. Created a new service, https://github.com/mbari-org/pythia, for applying yolov5 inference to images. This service is a replacement for https://github.com/mbari-org/keras-model-server-fast-api

Week 10

1. Brian Schlining
    a. Ongoing Iron Mountain video imports from our video tapes.
    b. The machine running the ML model server used by VARS had a RAID failure. This service has been very popular with the video lab, so Brian moved the service to a temporary machine. Details here.
        i. Started investigation into simplifying the ML model server (written by CVisionAi). The service currently has a complicated software stack that could be greatly simplified.

Week 8

1. Duane Edgington
    a. IS says "no problem upgrading from MacOS Monterey 12.6.3 to MacOS Ventura 13.2.1" Wish me luck…
    b. Continued work drilling into AWS SageMaker Studio EFS volume maintenance. Some progress, but more to do.
2. Brian Schlining
    a. VARS Bug hunt to address outstanding issues. There were two new VARS releases last week.
    b. Sharktopoda 2.0.3 was released. This addresses feature requests from the video lab.

Week 7

1. Kevin Barnard
    a. Implemented several feature requests in vars-gridview
2. Duane Edgington
    a. Continued exploration of the EFS file system attached to SageMaker Studio issue. Will be pursuing suggestions received from AWS Support Feb 15.
3. Brian Schlining
    a. The last round of server patches broke the docker daemons on a few servers. Worked with IS to get those back up.
    b. Updated the vars-kb and vars-query apps to build on Java 19.
    c. Working with Paul Rogers on improvements to Sharktopoda based on video lab feedback.
    d. Released VARS Annotation 1.4.8. This release replaces the JavaFX TableView component with a Swing-based one to work around long-standing, hard-to-squash bugs: #128, #129.
    e. With the recent major changes in VARS. Brian is running through a bug hunt exercise to chase down edge cases.
    f. Testing out a timeline view to VARS.

Week 6

1. Kevin Barnard
    a. Implementing Sharktopoda 2 remote protocol in Python
2. Duane Edgington
    a. Some work/discussion on VAA deepsea-ai documentation. Ran test of documented processing flow on AWS ECS.
3. Mike McCann
    a. Linda reports that edited “by_dive” files look good in the emdb web app - ready for loading
4. Brian Schlining
    a. Iron Mountain video imports. Rough estimate of work completed to date: 4,067 of 6,668 dives converted from tape to video.
    b. Updated the `annotations_legacy` view in the M3_ANNOTATIONS database so Steve Haddock can use beholder to grab ad hoc images of annotations.
    c. Milestone: Loaded the first series of dives analyzed by machine learning into VARS. 16 dives (D1372 - D1389) were processed, producing 84,687 localized annotations. These annotations are all tagged with the group ‘ROV:pending-verifications’. Addressed issues in the new tooling used for working with these annotations in VARS.
        i. Develop tools to preview data in Sharktopoda for both the full ML output (which is very large) and the subset of data that would be imported into VARS.
    d. The TableView control used in VARS is thoroughly broken. (Due to changes introduced by the JavaFX library developers over time). Brian is starting a rewrite of a table control to work around these issues. Related issues are: here, here, and here.
    e. Rewrote the code that syncs dive information into VARS. The previous version was written before we started the video conversion process (Iron Mountain). The amount of new video files was overwhelming the app.

Week 5

1. Kevin Barnard
    a. Chatted with Brian to figure out BoxJelly & Cthulhu upgrades for new video player (Sharktopoda 2)
    b. Worked on Cthulhu upgrade for new remote protocol
2. Duane Edgington
    a. Monitored Lonny’s Paull dive series run on AWS. ECS runs were successful, over several days.
    b. Removed Lonny’s SageMaker Studio App per his approval.
3. Mike McCann
    a. Added point visualization in emdb web app for by_dive nav files that are being re-edited
4. Brian Schlining
    a. Working on the final stage of the ML pipeline … pushing data to VARS. Working though integration testing now.
    b. Reviewed M3RS documentation for video lab
    c. Fixed frame advance issue in VARS for the new Sharktopoda.
    d. Added database indexes for the deepsea-ai database
    e. Restored services that tanked after the power outage.

Week 4

1. Kevin Barnard
    a. Explored YOLOv8 as an option for future object detection models
2. Duane Edgington
    a. Working on deepsea-ai documentation. Our task is to meld in vaa-docs to form one up-to-date documentation repo.
3. Brian Schlining

a. The latest Sharktopoda video player is now running in the video lab for evaluation with VARS Annotation. This allows visualization, creation, and editing of localizations created by hand or via machine learning directly on video.
b. Worked through Apple's latest code signing and notarization requirements for both Sharktopoda and VARS Annotation.
c. Dealt with the usual Iron Mountain video imports.
d. Started work on updating the import of ML generated annotations into VARS to work with the latest version of the deepsea-ai graphql API.
e. Imported Mini ROV annotations for dives M0180 through M0192 into the main VARS database.
f. Fixed a bug in VARS that prevented the frame-advance feature in a shuttle controller from working with the new Sharktopoda.

Week 3

1. Danelle Cline
    a. The AWS video processing workflow is ready for integration potentially in Q2, pending video lab efforts to understand how to best work with the ML output.This scalable processing workflow has been optimized for cost and can process approximately 70-90 hours of video per day for $1.50 per recorded video hour, Results are stored in the M3_TRACKS database. A web dashboard provides an overview.
2. Duane Edgington
    a. Met with Timothy Ryter, AWS Storage Specialist, along with Emmett and Ted, regarding EFS storage volume and SageMaker Studio. Timothy provided guidance on how to examine an EFS volume, and how to potentially reduce lifecycle costs. Timothy and Ted are going to check with the SageMaker Studio team to ensure Timothy's advice is sound, and then inform me of that team's guidance.
3. Brian Schlining
    a. Released VARS Annotation 1.4.3. This includes support for localizations of annotations directly on video using Sharktopoda 2
        i. This release surfaced some issues with Sharktopoda 2. Investigating those.
    b. Sharktpoda 2 requires Mac Ventura. With every new release of macOS, Apple changes the signing requirements for applications. If these requirements aren't met, Apple makes it extremely difficult for users to start the apps. Ventura continues this tradition. Brian is working with IS to get the signing and notarizing certificates needed to meet Apple's security requirements for both Sharktopoda and VARS Annotation.

Week 2

1. Kevin Barnard
    a. Backup for Brian on vacation
2. Duane Edgington
    a. AWS work on AWS secrets manager, cost explorer
    b. Meeting scheduled for Thursday Jan 12 with Ted Zamborsky and an AWS EFS specialist regarding our EFS daily charges and use with SageMaker Studio and other AWS services.
3. Mike McCann
    a. Provided input the data workflow documentation that Megan is writing

Week 1

1. Kevin Barnard
    a. Working on upgrading Cthulhu for new Sharktopoda 2 remote control
2. Brian Schlining
    a. First iteration of new Sharktopoda completed and released to the video lab. This allows localization/annotation directly on a video.
    b. New Sharktopoda has been integrated with VARS Annotation 1.4.0-rc8

c. Released my first library to maven central. Vcr4j, which provides the integration between VARS and Sharktopoda (among other things), has been published to https://repo1.maven.org/maven2/org/mbari/vcr4j/