

902005 - VARS Annotation Assistance

Week 51

1. Kevin Barnard
 - a. Several new BoxJelly features/fixes
 - i. Implemented undo/redo stack for track edits
 - ii. Broke out video & track file load into File menu operations
 - iii. Refactored to support model-view-delegate pattern
 - b. Performed cost/performance analysis model training
 - c. Trained first yolov5l6 model at 1280x1280 image resolution on 33k image set
2. Danelle Cline
 - a. Team is working on AWS cost/performance benchmarking. Cost per video thus far ranging from \$1.70 to \$4.40 per video for detailed annotation, \$70-170 for training, depending on the size of the model (640x640 or 1280x1280) with varying mAP. Performance plots forthcoming, probably after the holiday break. Thus far, 794673 unique detections and 4846 annotations have been generated during testing.
 - b. Working on Vue app to consolidate all the AWS job/training management
 - c. Updates to deepsea-ai-py code to support latest schema changes. Those are in the branch [db1.11.0sync](#)
3. Duane Edgington
 - a. Continuing test runs/benchmarks of tracking against full resolution 15min benthic videos.
4. Brian Schlining
 - a. Integrated [Cthulhu](#) video player with [VARS Annotation](#). Cthulhu allows users to edit/create localized annotations directly on video. Works with the new 4k video too.
 - b. Fixed minor issues in Cthulhu's handling of resized localizations.

Week 50

1. Kevin Barnard
 - a. Performing cost/performance analysis of transfer learning on different YOLOv5 model variants via AWS SageMaker
 - b. Fleshing out some MOT editing features in BoxJelly
2. Duane Edgington
 - a. Working with Danelle and Kevin B. on year-end tasks

Week 49

1. Kevin Barnard
 - a. Further developed BoxJelly and sharktopoda-client-py
 - b. Tested the new YOLOv5 codebase for training on AWS SageMaker. Trained yolov5x model successfully with multi-GPU support
2. Kent Headley
 - a. Brian indicates that the new Black Magic frame grab server is functioning well, and he plans to start integration and test on the ships in the next week or two

Week 48

1. Kevin Barnard
 - a. Updated YOLOv5 training documentation
 - b. Investigating GCP Video Intelligence API for analysis of underwater video

- c. Started porting the sharktopoda client library to Python -> will help with integration of BoxJelly and Cthulhu
- 2. Danelle Cline
 - a. Mtg planned with AWS Principal Enterprise Strategist on the nonprofits team to discuss alternative funding / support options, models, data formats, and our ML roadmap.
 - b. Deployed changes to deepsea-ai database server with added video process ARN and some refactoring of tables. Docs on [queries](#) and [mutations](#) updated.
 - c. YOLOv5 model testing on A100 for distributed training. Newest code release needs to be integrated into deepsea-yolov5 for full support.
 - d. Upgraded to OpenCV 4.5, CUDA 11.3.1, and minor tracking bug fixes to handle small objects exceptions in deepsea-video-track pipeline processing. CSRT tracker performs better than KCF for benthic video, but it is slower ~15-20 FPS.
- 3. Kent Headley
 - a. Fixed some memory leaks, added some new features
 - b. Working on documentation for the frame grab server and client
 - c. Brian S is prepping for integration and test

Week 46

- 1. Kevin Barnard
 - a. Concluded 2-day sprint to test documented train/infer/load workflow
 - b. Debugged code to train YOLOv5x model on AWS Sagemaker; now testing
 - c. Developed timeline UI components for BoxJelly to visualize multiple object tracks in video
- 2. Kent Headley
 - a. Started fast-turn on VARS frame capture application needed early in 2022
 - b. Initial cut is functionally complete
 - c. Pressure is off, thought momentum is up; continuing to test and add features
- 3. Carlos Rueda
 - a. Adjustment in SageMaker-based metrics UI to replace “checkpoints” column with “S3ModelArtifacts” (whose values are taken from a separate “describe training job” query. Cleaned up and added comments to the code along the way.
- 4. Brian Schlining
 - a. 2-day sprint to test workflow starting from a species list and ending with annotated video. Follow up tasks are [here](#).

Week 44

- 1. Danelle Cline
 - a. Working with Duane Edgington and Kevin Barnard on documentation <http://docs.mbari.org/internal/vaa-docs/>
 - b. Team meeting planned for Friday to work through remaining tasks & assignments for the year
- 2. Brian Schlining
 - a. Working through some Image ML courses before our next sprint.

Week 43

- 1. Duane Edgington
 - a. Continue work on documentation

Week 42

- 1. Duane Edgington
 - a. Working session on documentation (and documentation tools and format)

Week 41

1. Duane Edgington
 - a. Sprint work October 4-8 and October 11. Great progress. Documentation sprint planned for Oct 14.

Week 40

1. Duane Edgington
 - a. Monday - Friday Sprint on model inference and integration of model output with VARS
2. Brian Schlining
 - a. Working with the team on an end-to-end sprint of a video processing pipeline.

Week 36

1. Duane Edgington
 - a. Cleaned up notebooks, AWS SageMaker Studio, to remove unnecessary data repository
 - b. Message to Kevin G and Danelle C regarding AWS EFS charges and SageMaker studio

Week 34

1. Duane Edgington
 - a. Work on phase 1 MT feedback.

Week 33

1. Duane Edgington
 - a. AWS proposal meeting Aug 18
 - b. Working group session planned Aug 19.

Week 32

1. Duane Edgington
 - a. Built AWS testuser group and user to test workflows we wish to release to users to ensure we have captured required permissions
 - b. Working meeting planned Aug 12

Week 31

1. Duane Edgington
 - a. Meeting with Danelle on architecture diagrams
 - b. Attempted to support Lonny on AWS IAM issue
2. Carlos Rueda
 - a. Added a "Started" column to the main table in the SageMaker metrics [UI](#).

Week 28

1. Duane Edgington
 - a. Project proposal

Week 27

1. Danelle Cline
 - a. 2022 proposal
2. Duane Edgington
 - a. 2022 proposal reading and work

- b. Work on AWS proposal draft

Week 26

1. Duane Edgington
 - a. Working on 2022 project proposal
2. Carlos Rueda
 - a. Meeting and minor addition to the SageMaker UI prototype.

Week 24

1. Duane Edgington
 - a. Meetings with Carlos, Danelle on GraphQL interface to VARS and Vue app
2. Carlos Rueda
 - a. Met with Danelle and Duane. Updated SageMaker metric UI to show the ModelArtifacts member of the DescribeTrainingJobCommand response for quick inspection. Next steps in terms of use of this trained model information are still to be determined in more detail.

Week 23

1. Duane Edgington
 - a. Conference call with Danelle and Carlos regarding graphGL work to integrate output of VAA into M3
 - b. Continuing Vue training (Vue mastery)
2. Carlos Rueda
 - a. GraphQL discussion.

Week 22

1. Danelle Cline
 - a. Cloud-enabled the video processing pipeline. Only 40 lines of code for a full video processing pipeline in SageMaker. Pretty cool.
 - b. Working with the team on pulling out performance metrics in the VAA SageMaker web app. So far so good.
2. Duane Edgington
 - a. Conference calls with Carlos and Danelle on VAA Vue app (training metrics)
3. Carlos Rueda
 - a. Advancing the VAA Vue project to [display performance metrics](#) retrieved via AWS APIs.

Week 21

1. Duane Edgington
 - a. Continued work on AWS Cloudwatch and SageMaker API / SDK -- gathering metrics from SageMaker training job runs.
2. Carlos Rueda
 - a. With Duane and Danelle, advancing the VAA Vue project to display performance metrics retrieved via AWS SageMaker and CloudWatch APIs.
3. Brian Schlining
 - a. [Reorganized](#) CSUMB Capstone student's project, a simple standalone video annotation editor, and packaged it up as an [application](#).
 - b. Updated build of Cthulhu and published a [new release](#) for the video lab to test. Cthulhu is still failing to play videos on Ubuntu. Brian is working on setting up alternate Linux distros for testing.

Week 20

1. Duane Edgington
 - a. Continued work on AWS SageMaker Training metric tracking API calls. Demoed some plots.
2. Carlos Rueda
 - a. Met with Danelle and Duane to discuss a VAA Vue project involving the display of performance metrics obtained via SageMaker API, which Duane will be focusing on, while I shall be helping with the UI side of things.

Week 19

1. Danelle Cline
 - a. Cost reporting for jobs is getting reported [here](#), and met with Carlos and Duane to discuss adding performance metrics to this same page.
 - b. Finishing up a video batch inference notebook
 - c. Adding the [dockerized C++ tracker](#) to the AWS Elastic Container Registry (ECR) so it can be executed from SageMaker ScriptProcessor. Once this is complete, all of the processing components will be cloud-enabled, and we can scale up processing if we want to.
 - d. Added [quick-start documentation](#) for database build.
2. Duane Edgington
 - a. Working sessions with Danelle and Carlos regarding Vue app for ML training job summary UI
 - b. Spinning up on Vue, Quasar/Vuetify, JS.
 - c. Final meeting with CSUMB capstone project team Wed May 12.

Week 18

1. Duane Edgington
 - a. Working through python SDK for AWS Price List Service (Query) API
 - b. Capstone Project CSUMB weekly meeting

Week 17

1. Duane Edgington
 - a. Working on the task to search SageMaker job records for values of interest (Billable time, Spot instance or not, etc). Sprint 2: Train. Good progress. I have the search results in a python dictionary; working through how to harvest and display.
 - b. Meet with the CSUMB Capstone team Friday April 30.
2. Brian Schlining
 - a. Ran [visualization/performance testing](#) using [Cthulhu](#) with a [full video's worth of ML generated annotations](#).

Week 16

1. Duane Edgington
 - a. Working through AWS SageMaker Studio Pipelines and Lambda functions.
 - b. Weekly meeting with CSUMB capstone students

Week 14

1. Duane Edgington
 - a. Continuing exploration of Cloudwatch metric streams to harvest sagemaker and S3 instance costs
 - b. CSUMB capstone project team meeting April 7
2. Carlos Rueda

- a. Completed the box resizing feature in Cthulhu; also added box repositioning/removal, and immediate editing mode upon annotation selection.
3. Brian Schlining
 - a. Reviewed and tested Carlos' PRs for [Cthulhu](#)
 - b. Modified [vcr4j](#) libraries to work with latest Java versions.

Week 13

1. Duane Edgington
 - a. Working on Sprint 2 task
2. Carlos Rueda
 - a. One more Cthulhu [request](#) is now pretty advanced ([PR](#)).
3. Brian Schlining
 - a. [Reviewed PRs](#) from Carlos for Cthulhu

Week 12

1. Duane Edgington
 - a. Working on Sprint 2 tasks due March 24 2021.
2. Carlos Rueda
 - a. More Cthulhu fixes ([PR](#))

Week 11

1. Danelle Cline
 - a. Fixed issues with deesea-tfrecord versioning and correct DVC registry build/delete in [vaaregistry](#). Learned more than I wanted to know about python packages, docker tests and DVC.
 - b. Started on Sprint 2 to train in AWS using the TensorFlow implementation of Google's [Efficient Detection model](#).
2. Duane Edgington
 - a. Sprint 2 kickoff with Danelle. Looked at tags in S3, ML; discussed sagemaker studio vs command line for end-user engagement.
 - b. Experimenting with recent updates to Sagemaker Studio
3. Carlos Rueda
 - a. Looking into Cthulhu issues, in particular this one, [#2](#).

Week 10

1. Duane Edgington
 - a. Team meeting March 4
 - b. Capstone project team meeting March 10
 - c. Start of Sprint 2 this week
 - d. Sprint 1 wrap-up March 8.
2. Carlos Rueda
 - a. Resolved [one](#) of the outstanding Cthulhu bugs!

Week 9

1. Danelle Cline
 - a. Week 2 of 2 week sprint going well. Training data staged on Atlas and scripts for generation and upload in progress with AWS tagging proposal.
2. Duane Edgington
 - a. Completed asset AWS tagging proposal. Exploring AWS Tag Editor (very slick).

- b. Completing AWS Containers course -- this week is Kubernetes week.
- c. Biweekly AWS SageMaker Friday video workshop.

Week 8

1. Danelle Cline
 - a. Working on week one of a two-week sprint with the team to stage training data. Data registry tool is taking shape and data storage and cost tagging has started. Coordination on tasks through ClickUp is good so far.
 - b. Weekly meeting with CSUMB capstone team. Students are getting to know the data and running through tutorials to familiarize themselves with the tasks.
2. Duane Edgington
 - a. Working on Sprint tasks. Tags for tracking costs etc in AWS.
 - b. AWS Innovation conference Weds Feb 24. AI/ML
 - c. Weekly meeting with CSUMB capstone team
3. Carlos Rueda
 - a. Looking into Cthulhu related tasks.

Week 7

1. Duane Edgington
 - a. Meeting with CSUMB capstone project team Feb 17
2. Carlos Rueda
 - a. Meetings.

Week 6

1. Duane Edgington
 - a. Team meetings Feb 10, 11.
 - b. Continuity work on task associated with AWS Fargate and AWS containers
2. Carlos Rueda
 - a. Meetings.
 - b. Reading/viewing some misc materials.
3. Brian Schlining
 - a. Fixed a bug in Cthulhu that prevented users from opening a local video manually.

Week 5

1. Danelle Cline
 - a. Project planning
 - b. Onboarding discussion with Carlos Rueda
2. Brian Schlining
 - a. Beginning work with CSUMB capstone students to improve the video player [Cthulhu](#), used to [visualize machine learning output](#).

Week 4

1. Brian Schlining
 - a. [Wrote an app](#) to read from Danelle's GraphQL service, extract a minimal data representation of ML generated annotations, and import them into VARS

Week 3

1. Brian Schlining

- a. Working with output from ML.
 - i. [Created an app](#) that fetches Danelle's graphql and sends the data to [Cthulhu](#) to visualize it.
 - ii. Created a demo app using a static ML file to visualize in Cthulhu. This will allow the work to be handed off to students. Submitted a capstone project to CSUMB for students to work on Cthulhu
 - iii. Working on a data transformation to load a subset of ML data from graphql into VARS

Week 2

1. Danelle Cline
 - a. Updating deepsea-ai GraphQL API to correctly reference VARs video references and adding query and mutation capability as needed for Cthulu testing.
 - b. Deepsea-ai.shore.mbari.org setup is pending request to move to Ubuntu and docker (instead of CentOS7 and podman which has been fraught with issues).
 - c. After countless interruptions to fix an issue with wandb logging which interfered with SPOT training, I think I've finally solved it and I'm ready to do cloud training.
2. Brian Schlining
 - a. Spun up on GraphQL
 - b. Working on a prototype to display ML generated IDs and localizations on top of video using data pulled from Danelle's prototype database.

Week 1

1. Danelle Cline
 - a. Installing GraphQL API to serve Visual Event Tracks and other machine learning data to the new CentOS7 VM deepsea-ai.shore.mbari.org. This has uncovered some unfortunate truths about the limitations of CentOS as a replacement OS for MBARI.
2. Duane Edgington
 - a. Project status, kickoff meeting
3. Brian Schlining
 - a. Requested a ML output data sample needed to build an app to display the ML-generated bounding boxes in [Cthulhu](#).