Kevin Barnard Sorted By Project

500055 - VARS, M3/RS, DSG

- Working on upgrading Cthulhu for new Sharktopoda 2 remote control (Week 1)
- Backup for Brian on vacation (Week 2)
- Explored YOLOv8 as an option for future object detection models (Week 4)
- Chatted with Brian to figure out BoxJelly & Cthulhu upgrades for new video player (Sharktopoda 2) (Week 5)
- Worked on Cthulhu upgrade for new remote protocol (Week 5)
- Implementing Sharktopoda 2 remote protocol in Python (Week 6)
- Implemented several feature requests in vars-gridview (Week 7)
- Validated class list for 315k model (Week 11)
- Fixed open video from vars-gridview (Week 13)
- Fixed loading of ML-generated annotations in vars-gridview (Week 13)
- Started scoping DSG overhaul, knowledge base server/client (Week 17)
- Started reimplementing vars-kb-server in Scala 3, standalone from vars-kb core (Week 18)
- Working on vars-kb-server rewrite (Week 21)
- Scoped integration of clearvision/imagehash capabilities into vars-gridview (Week 21)
- Discussed ML/DSG priorities (Week 22)
- Scoped features for vars-gridview to aid in ML workflow (Week 22)
- Implemented Python client for Sharktopoda 2 video player, to support VARS GridView integration (Week 23)
- Several upgrades to vars-gridview (Week 24)
- Wrote sharktopoda-client-py for Sharktopoda 2 UDP controls (Week 24)
- Added group and activity filtering capabilities to m3-download (Week 24)
- Investigated reported issue of vars-gridview changing observation fields (Week 24)
- Implemented support for video frame localizations (i.e., without a framegrab) in m3-download for next training run (Week 26)
- Continued integration of Sharktopoda 2 and VARS GridView (Week 26)
- Investigated timestamp difference between Sharktopoda 2 and Beholder (Week 28)
- Added query filters for observation activity and group (Week 28)
- Implemented multiple sort (Week 28)
- Implementing several features requested by VL into VARS GridView (Week 29)
- Made some progress on time synchronization issue (Week 30)
- Released VARS GridView changes (Week 31)
    - Query on bounding box association JSON fields (Week 31)
    - Sort on multiple fields (Week 31)
- Investigating “vars-part-ingest” bounding box quality in VARS (Week 33)
- Implemented feature requests for VARS GridView (Week 33)
- Completed and released VARS GridView feature requests (Week 34)
    - Sort by multiple values (Week 34)
    - Delete observations with localizations (Week 34)
    - Setting for font size (Week 34)
    - Context menu in image pane (Week 34)
    - Click to select box from image pane (Week 34)
    - Drag-select localizations from grid view (Week 34)
- Investigated changing observer when box changes → not the case (Week 34)
- Continued integration of VARS GridView with Sharktopoda 2 (Week 34)
- Remapped embargoed concepts in mbari315k_yolov8 model for public release (Week 34)
- Rolled out several VARS GridView feature requests (Week 35)

- Continued integration of VARS GridView with Sharktopoda 2 (Week 35)
- Resolved question of off-image bounding boxes in VARS (Week 37)
- Added pass-through for confidence field from ML inference to VARS bounding boxes (Week 38)
- Fixed IPv4/IPv6 UDP socket issue in Sharktopoda client library (Week 39)
- Implemented feature requests in VARS GridView (Week 39)
    - Handle annotations made on different-resolution source video (Week 39)
    - Refit image detail view on ROI selection change (Week 39)
- Implementing handling of different-resolution source video (i.e., rescaling) in m3-download dataset generation (Week 40)
- Began overhaul of VARS GridView querying/object graph management (Week 42)
- Fixed VARS GridView issue with bounding boxes on framegrabs re-capturing frame from video (Week 45)
- Sorted out video/image reference association in VARS GridView (Week 45)
- Assisted with Marimba software development at CSIRO (Week 46)
- Investigated reported issue about VARS observer changing via VARS GridView (Week 46)
- Several fixes & improvements to VARS GridView (Week 46)
    - Fix issue of framegrab bounding boxes using video (Week 46)
    - Autorange image view only on image change (Week 46)
    - Apply default chronological sort (Week 46)
    - Add icons for “open settings” and “query” actions (Week 46)
    - Sharktopoda 2 integration working (Week 46)
- Implemented several features for VARS GridView (Week 49)
    - Image caching (Week 49)
    - Sharktopoda 2 bounding box scaling (Week 49)
    - Visual improvements to grid view ROI widgets (Week 49)
    - Split label behavior into label, verify, unverify (Week 49)
    - Arrow key grid view controls (Week 49)
    - VARS observer in image details (Week 49)
    - Side taskbar (Week 49)
    - Bring Sharktopoda 2 video windows top-level on open (Week 49)
    - Sort by verifier (Week 49)
    - Customization of selection highlight colors (Week 49)
    - Map concepts to VARS KB primary names (Week 49)
- Resolved issue with FreeTDS bug in TDS 7.3 datetime2 parsing (Week 49)
- Started planning features for 2024 VARS GridView rewrite (Week 49)
- Continued working on VARS GridView. Finished implementing: (Week 50)
    - Packaging configuration with Apple code signing and notarization (thanks Joe!) (Week 50)
    - Show all, show verified, show unverified toggles (Week 50)
    - Bring Sharktopoda video player window top-level on open (Week 50)
    - Maintain sort order across updates (Week 50)
    - Sort by bounding box proposal confidence (Week 50)
- Experimented with visual similarity indices, image hash-based clustering (Week 50)

901809 - Deep Sea Bioinspiration

- Started to rework ML-Tracking paper per feedback (Week 5)
- Revised ML-Tracking paper (Week 6)
- Resubmitted DeepSTARia paper to Science Robotics (Week 16)
- Preparing for Open House (Week 30)
- Provided feedback for several intern and lab presentations (Week 33)
- Submitted DeepSTARia to OSM (Week 37)

902002 - FathomNet

- Investigated PM tools: GitHub projects, Notion, misc. gantt integrations (Week 2)
- Worked on packaging vars-localize for Smithsonian volunteers (Week 3)
- Met to plan February FathomNet workshop (Week 5)
- Wrote steps to publicly host images via Firebase/Google Cloud Storage for contributors (Week 5)
- Prep for upcoming workshop Feb 22 & 23 (Week 6)
- Planned milestone 2.3 tasks Feb-April (Week 7)
- Gave presentation of VARS & FathomNet at Ifremer FUTUROBS workshop (Week 12)
- Set up development environment for FathomNet/OVAI QSCP service (Week 13)
- Working on ORCID authentication/attribution for FathomNet (Week 14)
- Worked on FathomNet beta-2.3 backend tasks (Week 20)
- Working on finishing up community feature support in fathomnet-rest-api (Week 21)
- Implemented several features for v1.0 launch (Week 22)
    - Audit bounding box history by several keys (Week 22)
    - Follow concepts/marine regions/users (Week 22)
    - Comment on bounding boxes (Week 22)
- NSF reporting (Week 22)
- Finished FathomNet v1.0 features; released updated site (Week 26)
- Started migrating models from GitHub/Zenodo to Hugging Face (Week 30)
- Uploaded MBARI 315k YOLOv5 and v8 models to FathomNet model zoo (Week 34)
- Created HF space for FathomNet2023 Kaggle challenge baseline YOLOv8 model (Week 34)
- Gardened FathomNet community feedback issue tracker (Week 35)
- Populated web UI issues to be tackled in the near future (Week 35)
- Provided D1376 video and bounding box annotations to University of Washington CS department for evaluation of VOCALExplore on VARS data (Week 36)
- Met with ONC to discuss potential collaboration (Week 46)
- Planning for ONC collaboration (Week 49)

902204 - Scalable Robotics

- Kickoff meeting; established sub-projects, milestones, project organization (Week 2)
- Wrote lcmlog-py library for reading/writing LCM logs (Week 2)
- Spliced images into LCM logs for GIM (Week 2)
- Calibrated Mola 4K camera using new calibration library (Week 3)
- Several meetings for 2023 planning (Week 3)
- Set up new repository for LCM-related tooling (Week 3)
- Calibrated Mola 4K camera (Week 4)
- Added fisheye calibration to camera calibration library (Week 4)
- Collected calibration dataset from Mola in TT (Week 4)
- Wrote Dash app for visualizing live position data from Mola USBL via LCM (Week 4)
- Deployed Mola in test tank to collect SLAM dataset for GIM (Week 5)
- Calibrated Mola FLIR stereo cameras (Week 5)
- Performed Mola stereo calibration (Week 6)
- Working on camera calibration library (Week 6)
- Wrote Python library for CoMPAS LCM types; to be published on PyPI (Week 7)
- Wrote AprilTag detection script (Week 7)
- Collected dataset with Mola to test AprilTag detection/pose estimation (Week 7)
- Ran analysis on camera intrinsic calibration to validate GIM reports on Mola 4K cam (Week 11)
- Dockerized RTAB-Map ROS wrapper, tested (Week 11)
- Met with potential collaborators for off-center dome port camera calibration (Week 12)
- Working on fixing GIM code for RTAB-Map ROS2 online execution from recorded LCM logs (Week 12)

- Wrote LCM WebSocket server for future webapp (Week 13)
- Implemented pose estimation of AprilTags for Mola ground truth pose (Week 13)
- Ran ROS2 RTAB-Map on Pacific Northwest full survey dataset (Week 13)
- Several fixes to lcm-websocket-server (Week 14)
- Dockerizing lcm-websocket-server (Week 14)
- Calibrating new stereo cameras (Week 14)
- Working on calibrating new stereo cameras (Week 15)
- Fixing issues with stereo extrinsic calibration on new MiniROV and Mola stereo cameras (Week 16)
- Provided calibration datasets to Technion Israel Institute of Technology (Week 16)
- Scoped rework of RTAB-Map (+ ROS2 wrapper) to support arbitrary constraint specification to GTSAM factor graph backend (Week 16)
- Completed Mola and MiniROV stereo camera calibrations (Week 17)
- Writing up documentation and helper scripts for new camera calibration library (Week 17)
- Dockerized lcm-websocket-server, wrote CI pipeline for build & push to Docker Hub (Week 17)
- Performed MiniROV deployments on Fulmar (Week 18)
- Ran analysis/validation of MiniROV data (Week 18)
- Preparing for LASS deployments on the Carson (Week 18)
- Participated in RC cruise; fixed lots of issues with RTAB-Map SLAM (Week 20)
- Calibrated MiniROV stereo cameras after remounting to match data from Fulmar cruises (Week 21)
- Support and fixes for RTAB-Map SLAM ahead of DOEST demo (Week 21)
- RTAB-Map development support (Week 22)
- Prepared DOEST presentation (Week 23)
- Supported fixes to RTAB-Map (Week 23)
- Scoped range-based SLAM (with multibeam sonar) in collaboration with GIM Robotics (Week 26)
- Revisiting tasks related to GIM WP-1 for visual SLAM (Week 29)
    - Issues with loop closure/feature association (Week 29)
    - Long-survey performance (Week 29)
    - Multi-session capabilities of RTAB-Map (Week 29)
- Identified issues with visual loop closure detection in RTAB-Map (Week 30)
- Investigated loop closure issues on May 2023 LASS datasets (Week 31)
- Continuing to investigate loop closure issues on May 2023 LASS SLAM dataset (Week 33)
- Continued investigating loop closure issues (Week 34)
- Completed investigation of visual loop closure issues (Week 36)
- Straightened out branches in several GIM SLAM-related repositories (Week 36)
- Solved issue with invalid TF2 transforms and failing initial guess for RTAB-Map SLAM visual odometry (Week 37)
- Began implementing feature to consider multiple candidates for loop closure in RTAB-Map (Week 38)
- Fixed some bugs in RTAB-Map SLAM pipeline (Week 38)
- Tested loop closure detection in May 2023 LASS dataset (Week 38)
- Implemented visual loop closure multi-candidate registration (Week 39)
- Finished and tested implementation of multiple candidate registration for global loop closure in RTAB-Map (Week 40)
- Created launch configuration files for LASS deployment – (Week 40)
- Collected calibration datasets for MiniROV DSPL stereo cameras (Week 40)
- Resolved several RTAB-Map/LCM to ROS bridge bugs and coordinate frame convention issues (Week 40)
- Participated in LASS cruise – (Week 42)
- Calibrated MiniROV stereo cameras (Week 42)
- Calibrated LASS stereo cameras (Week 42)
- Prepared MiniROV SLAM launch configuration for cruise starting (Week 42)
- Participated in Fulmar cruise (Week 46)
- Wrote ROS2 TF → LCM CoMPAS odometry republisher node (Week 46)

902304 - Piscivore Cam

- Made some improvements to Lonny's video processing code (Week 34)
- Met with team to review ML workflow and outline improvements (Week 35)
- Scoped process for ingesting bounding box proposals into VARS (Week 35)
- Reviewed Lonny's code (Week 35)
- Started working on YOLOv8 → VARS data loader (Week 50)

DQ2209 - Ocean AI 2

- Put together example image datasets for game developers (Week 3)
- NSF program director visit (Week 14)
- Supporting work for QSCP service (Week 15)
- Rewrote codebase for QSCP using PostGraphile (Week 16)
- Led discussion with OVAI Programmers Working Group (Week 20)
- Collected unlabeled image dataset for QSCP from Kakani's dives (Week 21)
- Ran OVAI programmers working group discussions (Week 21)
- Scoped and planned efforts for FathomVerse MVP/QSCP experiments (Week 21)
- QSCP support, documentation (Week 22)
- FathomNet backend development, frontend support (Week 23)
- Supported QSCP development; planned MVP experiments (Week 23)
- CVPR conference; presentation, workshop (Week 26)
- Prepared program-wide product update (Week 26)
- Coordinated OVAI PWG meeting (Week 28)
- Hosted OVAI-PWG discussions (Week 29)
- Started migration of model zoo to Hugging Face (Week 29)
- QSCP retrospective/planning discussion (Week 30)
- Prepared content for FathomNet AI/MBA volunteer workshop (Week 33)
- Continued user storyboarding process (Week 34)
- Scoped FathomVerse CMS functional requirements (Week 35)
- Described greenfield development tasks for FathomVerse Content Management System (CMS) (Week 36)
- Set up CI/CD semantic versioning and release for fathomnet-py (Week 37)
- Tacked several fathomnet-py issues (Week 37)
- Met with Open World Object Detection folks (Week 37)
- Discussed LLM integration for FathomNet querying via natural language (Week 37)
- Led OVAI PWG discussion 9/20 (Week 38)
- Ran OVAI Programmer Working Group meetings (Week 39)
- Gave OVAI-wide FathomNet product update (Week 39)
- Discussed FathomVerse CMS development timeline (Week 40)
- Defined requirements for FathomVerse Content Management System (CMS) development (Week 42)
- Fixed all broken builds and runtimes of HF spaces in FathomNet model zoo (Week 42)
- Supported CMS planning & development (Week 46)
- Continued support for CMS development (Week 49)

Out of Office

- COVID: 1/3-1/12
- COVID: 1/3-1/20
- 2/27-3/10 CSIRO visit
- Volunteering at Bayview Academy Tech Fest, 2023-03-23
- Volunteering at FRC competitions for York school, 2023-03-31, 2023-04-06, 2023-04-07
- Jury duty 2023-04-03
- Fulmar 2023-04-25

- Fulmar 2023-04-25, 2023-04-28
- Rachel Carson 2023-05-10,11,12
- Sick 5/30-6/1
- CVPR (Vancouver) June 17-25
- Vacation June 30-July 9
- Vacation August 7-11
- CSIRO: Oct 20, 2023 – Nov 5, 2023
- LASS on Ventana/Rachel Carson cruise: Oct 10, 2023 – Oct 12, 2023
- MiniROV/Fulmar cruise: Nov 6, 2023 – Nov 7, 2023
- Vacation Dec 26, 2023 – Dec 28, 2023

Overhead

- Finished up ROV CTD transition to Karen (Week 3)
- Provided performance feedback (Week 3)
- Situating new office (Week 4)
- Assisted with RRE interviews 2/14 (Week 7)
- Raben focus group (Week 39)