

Kent Headley Sorted By Project

300057 - Mooring Maintenance

- Working with Jared to troubleshoot OASIS GPS (Week 28)
- The metsys has apparently been updated and the new model isn't compatible with the O3 driver. Will look at drivers and work w/ DMO on next steps (Week 28)
- Helping to troubleshoot GPS issues (Week 31)

500055 - VARS, M3/RS, DSG

- Testing updates to the black magic frame grab server (Week 3)
- Resolved an issue with the 8K Pro setup (Week 3)

600034 - Precision Control Technologies for ROVs and AUVs

- Code review for Irauv cooperative navigation that Rich is implementing (Week 1)
- Working with Rob on design and implementation of Dorado code for integrating MB-System real-time pre-processing (mbtrnpp) into the Dorado simulation loop (Week 11)
- Wrote an MB1 record server for embedding in the Dorado simulation code. This is part of enabling the integration of MB-System real-time bathymetry filtering and TRN with the Dorado simulation. (Week 12)
- Updates/maintenance and synchronization between MB-System and libraries libtrnav and mframe (Week 12)
- Met with Rob to talk about integrating TRN with Dorado simulation. Sent some sample code for the MB1 record server API. (Week 13)
- Ran pre-cruise data plumbing checks with Mike Risi and DJ Osborn (Week 16)
- Wrote initial implementation of beam transformation (Week 16)
- Testing and debugging ROV TRN application code (Week 16)
- Tested ROV TRN software on dive at Portuguese Ledge with Steve Rock, Mike Risi, Dave Caress and Giancarlo Troni. The primary cruise mission was to test control system software and collect a data set that could be used to continue developing a TRN application for the ROV. Despite marginal weather, the Carson/Ventana crews were able to give us more hours than expected, given the forecast, enabling us to reach our objectives. I was able to run TRN software during the dive; data flow and first long operation with real data went well. TRN results were encouraging and helped to expose some issues that would've been hard to find on shore, and I'm still sifting through data to resolve various TRN pipeline issues; the data set collected should enable this. Mike's control tests were also successful. (Week 18)
- Finished initial round of post-cruise updates to ROV TRN middleware (Week 19)
- Produced some test data for validation (Week 19)
- Added new logging/playback features to TRN core (pending review) (Week 19)
- Working through ROV TRN cruise data with Steve et al to test software and resolve issues. (Week 20)
- Working out reference frame issues for TRN inputs; easy to say, very time consuming to do (Week 21)
- Working to resolve ROV TRN issues (Week 23)
- ROV TRN testing (Week 24)
- Roughed in LCM input modules for messages used by the ROV simulation and Ocean Imaging tool sled. Next step is to refine the processing and get TRN running with the ROV simulator; Rob M is organizing a meeting this week. (Week 25)
- Added Octree utility and other updates and bugfixes to libtrnav (Week 25)
- Working on updates to help with packaging/installing TRN (Week 25)
- Working on TRN code for OI. (Week 26)
- Testing new input modules for ROV TRN (Week 27)

- Developing design for adapting ROV TRN code for OI toolsled (with dynamic acoustic measurement reference frames) (Week 27)
- Chatting w/ Rob re TRN integration with Dorado simulation (Week 32)
- Wrapping up a pull request (Week 32)
- Rob and I have made some good progress on Dorado TRN/fastsim integration. The simulator is publishing empty beam data, which is being picked up by a test client. I've made some updates to the test client to fix bugs and add features. Helping Rob with various network and software issues, and MB-System installation as needed so we can test more of the TRN path. (Week 34)
- Working with Rob to integrate mbtrnpp filtering/TRN processing with Dorado simulation. I've been developing some new C++ TRN client components for QNX, and working on making them portable to OSX/linux. The integration is progressing, and we are currently working out synchronization design to enable repeatable/deterministic simulation behavior; the two systems are not coupled/synchronized in real time, but must be in discrete time to ensure deterministic results. (Week 37)
- Completed pub/sub components for simulator, pending integration w/ Rob (Week 38)
- Working w/ Rob M to integrate mbtrnpp into Dorado simulation. This week, we're using a test utility I wrote to stand in for mbtrnpp so that the simulator TRN pub/sub components can be tested w/o mbtrnpp installed. (Week 41)
- 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. (Week 44)
- Working on ROV TRN processing for Dec ocean imaging cruise (Week 44)
- Refactoring ROV TRN to allow arbitrary number of TRN instances and multiple bathy sources (Week 46)
- Updating for ocean imaging toolsled (with multiple bathy inputs) (Week 46)
- Refactoring ROV TRN code for Dec cruise; feature complete, testing/debugging (Week 48)
- Working w/ Rob, Rich to integrate MB-System TRN beam filtering with Dorado simulator. Got this running for the first time this week. Testing. (Week 48)
- Demonstrated TRN sim integration w/ Rich, Rob (Week 49)
- Though the OI toolsled cruise was canceled, a lot of progress was made on Terrain Relative Navigation (TRN) for Ventana. The code developed earlier this year was refactored to be more flexible and scalable, and to address a number of bugs exposed during analysis of data from May and October cruises. In addition, new code was developed to use bathymetry from the OI toolsled, which are mounted on a rotating platform. This potentially enables using TRN on vertical surfaces with sufficient maps, e.g. canyon walls, icebergs, etc. (Week 51)
- Possibly reported earlier: mbtrnpp (TRN with multibeam filtering) is being integrated with the Dorado fast simulator. This was demonstrated recently. mbtrnpp is a TRN extension for MB-System, used with Dorado and WHOI's Sentry vehicle. There is still some integration cleanup pending. (Week 51)

901101 - Seafloor Mapping

- Working w Erik T on scheme for dorado config repos (Week 5)
- Code review for cmake implementation (O'Reilly) (Week 5)
- Preparing TRN software and doing testing for upcoming Ocean Imaging cruise days Mar 1-3 (Week 7)
- Erik has been making a number of software fixes and platform configuration improvements on the Dorado vehicles. I've addressed an issue in the TRN sonar protocol and added some features, and we're in the process of bringing everything up to date and make sure that it all works (hopefully better than ever). (Week 7)
- Preparing for cruise Mar 1-3 (Week 8)
- Installed and tested MB-System/TRN on reasons (Week 8)
- Testing TRN this week Tu-Th w/ Dave, Rich, Rob, Erik & Ops (Week 9)
- The main objective is to install TRN on both mapper vehicles w/ newly unified code bases, and validate TRN performance on both vehicles. There are a few new minor features, but we want to ensure that TRN and MB-System multibeam filtering are working correctly. DMO is also launching the I2Map vehicle concurrently w/ the mapping ops. (Week 9)
- Working with Mike Risi on TRN integration with ROV platforms (Week 11)

- Making progress on software components for using TRN with ROVs for an early May cruise. (Week 12)
- Wrote some automation scripts for packaging TRN releases for Sentry vehicle integration, and posted a release for WHOI (Week 12)
- Making progress on LCM stream processing for using TRN with ROVs (Week 13)
- Made some progress on integrating TRN with Ventana. Now producing and publishing records, from LCM input streams and leak tests are looking good, but some work remains to make record content completely valid. (Week 14)
- Meeting with WHOI about TRN integration on Sentry this Friday (Week 14)
- Telecon with Stefano Suman and Justin Fujii re Sentry TRN integration (Week 16)
- Resolved several issues in rovrn code; on track for cruise next week (Week 17)
- See Precision Control (Week 18)
- Working with Dave to plan ROV TRN activities for June Ocean Imaging cruise (Week 19)
- Planning TRN for Sentry cruise (Week 19)
- Working on MB-System build support for ROV TRN (Week 22)
- Testing geometry calc updates for ROV TRN pipeline (Week 22)
- Sentry TRN integration telecon and software updates (Week 22)
- Generated a feature update and MB-System TRN release for Sentry re upcoming Axial cruise (Week 23)
- Making and reviewing code updates for Axial/Sentry cruise (departs 3/19) (Week 24)
- Worked with Sentry team to resolve build/integration issues related to TRN (Week 25)
- The first Sentry Dive at Axial ran Monday with mbtrnpp collecting TRN data, initial results are encouraging. In addition to nice maps, returned with TRN converging consistently for much of the 19h mission. (Week 25)
- Second Sentry Dive started early Wed a.m.; Sentry will be accepting and logging TRN position offset estimates, but not yet using it for navigation. (Week 25)
- Various updates and code reviews for MB-system TRN (Week 25)
- Providing TRN support for Dave C at Axial. Apart from a weather day or so, Sentry has made a number of surveys that include TRN testing. Today, Sentry is using TRN to help remap a survey where Sentry nav had drifted substantially. The mission is on-going, and the survey lines are designed to bring Sentry in acomm range to check nav drift and TRN status. The first check (after ~6h) is good; TRN has so far been able to help correct for ~150m drift in navigation. (Week 26)
- Working on histogram support for MB TRN metrics plots (Week 26)
- The seafloor mapping cruise with Sentry ended July 1; During its successful series of science dives, Sentry flew two full science missions using assistance from MBARI's Terrain Relative Navigation software. It's a significant milestone in TRN development and its transition from Precision Control engineering research to scientific application; kudos to Rock, Caress, Henthorn, McEwen and the WHOI Sentry Team (Sean Kelly, Stefano Suman, Joe Garcia, Tim Joyce, Zac Berkowitz) for this success. (Week 27)
- Dave C mentioned that Hannah Piecuch at WHOI is writing an article for the National Deep Submergence Facility (NDSF) newsletter about our work integrating the MBARI/Stanford Terrain Relative Navigation (TRN) with AUV Sentry (operated by NDSF). Dave is coordinating with Raul N at MBARI. (Week 39)
- Testing TRN updates for OI toolsled (Week 49)
- Cruise plan in flux due to quarantining (Week 49)

901112 - Changes in MB and CA current (HIPPE/eDNA)

- Met with Nate, Francisco and Tom to discuss project plans and activities (Week 7)
- Started diagramming software stack for better insight into packaging options. The objective is to simplify the process of making and distributing the eDNA suitcase software payload. (Week 9)
- Met with Nate Truelove, who provided a great tutoring on DNA and sequencing technology to provide context for software work. (Week 11)
- Still messing around with purchasing a starter kit from ONT - they don't make it easy to give them money ;o) (Week 12)

901112 - The Monterey Bay Time Series

- eDNA : Spinning up on docker, conda, Nvidia platform (Week 5)

901220 - Midwater Ecology

901618 - Pelagic-Benthic Coupling and the Carbon Cycle

- Prepping for potential waveglider operation to survey rover using loop and cross algorithm (conditions permitting) (Week 5)
- With Chris Wahl and Paul McGill, piloted waveglider acoustic surveys to geolocate benthic rover and SES using an implementation of Paul's loop and cross algorithm that I implemented last year. The missions were both successful, and yielded accurate locations of the assets. (Week 6)
- Wrote a utility to process loop and cross data to produce a location estimate by minimizing mean squared error using a binary octree search (Week 6)
- Made bug fixes and simulator updates based on results from recent SES and rover surveys (Week 7)
- Worked with Chris W, Alana A and Rich H to run a loop and cross test at Sta. M (Week 17)
- The acoustic conditions were marginal, with ~20% range return rate (Week 17)
- The waveglider control algorithm performed reasonably well in terms of automated error recovery, i.e. detecting and responding to lost ranges) (Week 17)
- The mission didn't complete a full loop and cross cycle, but the error recovery patterns provided adequate spatial coverage to produce a location estimate (Week 17)
- Ran loop and cross test at station M last week. Acoustic conditions were poor, but conditions posed a good challenge for recovery algorithms, and the mission did produce some data and resulted in a location estimate for the rover. (Week 18)
- Coordinating w/ DMO and Smith group to fly waveglider loop and cross survey to locate rover during recovery next week; prepping mission (Week 38)
- Worked with Chris W, Paul M, Rich H and Ken S to run a wave glider acoustic survey to locate the Rover using Paul's loop and cross algorithm. Two surveys were run; the first had some problems due to a bug and some configuration issues. After addressing those, the second survey ran as we'd hoped. The results are still pending, but we did produce a location estimate for the Rover recovery. (Week 39)
- The earlier Rover acoustic survey produced an accurate location estimate (Week 42)

901704 - Benthic Observing System Maintenance

902204 - Scalable Marine Robotics Foundations

- Met w/ Gian Carlo re project activities (Week 16)
- Will scope some work related to writing driver for imaging sonar and evaluating ZCM communications middleware (Week 16)
- Met with Gian Carlo to discuss progress and next steps (Week 17)
- Met with Giancarlo re project goals (Week 18)
- Scoping eval of ZCM interprocess communication middleware (Week 19)
- Scoping driver development for (Week 19)
- Trying to find protocol documentation for Gemini 720i imaging sonar (Week 21)
- Looking at ZCM specs/doc (Week 21)
- Looking at Gemini sonar SDK (Week 23)
- Meet w/ GT and Bastian (Week 23)
- Set up repo for Gemini scanning sonar driver/app code (Week 24)
- Building Gemini Sonar SDK examples (Week 27)
- Resolved some build issues with SDK examples (thanks to Bastian M for the assist!) (Week 31)

- Looked at debug build support for Trittech Gemini sonar linux SDK; turns out unsupported, so requested windows SDK as a backup. (Week 32)
- Working on prototype application/driver for gemini (Week 33)
- Working on image capture - climbing Qt learning curve (Week 34)
- Working in Gemini imaging sonar driver; trying to grab visualization image frames along with raw ping data, which involves Qt and OpenGL - steep learning curve. (Week 35)
- Have made some progress on understanding image rendering w/ Qt, though currently stuck on Qt threading model (Week 38)
- (Week 38)
- Continuing work on Gemini sonar drivers for image distribution (Week 39)
- Adding features and fixing issues for the Gemini sonar driver/utility app. This week, changing the renderer to map sonar image output to cartesian coordinates and optionally convert to grayscale. Bastian M is reviewing images and providing feedback. (Week 41)
- 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. (Week 44)
- Testing/mob on the Carson for cruise 11/8. (Week 44)
- Looking at sonar data from Monday piggyback (Week 46)
- Working with Bastian to use image playback/capture pipeline on Gemini sonar dataset collected by Paul Roberts during a recent Barry cruise. (Week 48)
- Working on fast log playback; working with Trittech on SDK support (Week 49)

Out of Office

- Jan 11 (jury duty, tentative)
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- Mar 1-3 : ocean imaging TRN test cruise
- Out sick this week
- May 2 : Precision Control/Seafloor mapping Ventana TRN test cruise
- July 14-29 (tentative, vacation)
- Sick leave
- July 14-29 (vacation)
- Quarantining this week
- Dec 26-30 (vacation)

Overhead

- Review prep (Week 1)
- SRSC : reviewing material for board meeting (Week 1)
- Misc admin (Week 1)
- Review meetings and input (Week 3)
- SRSC meetings, helping Alana with ideas for presentation material (Week 3)
- Review materials out for signature (Week 5)
- Drafted materials list for Carbon Waveglider transfer package (Week 5)
- SRSC : outline review, meeting (Week 5)
- Attended meeting re SMD updates for David Packard (getting a sense for scope of work, timing) (Week 5)
- Software updates for various computers (Week 5)
- Office cleanup (Week 5)
- Review wrap up (Week 6)
- SRSC (Week 6)
- Misc admin (Week 6)
- Met w/ Craig and Paul re Carbon Waveglider transfer plan (Week 7)
- Wrapping up review process (Week 7)

- SRSC presentation review (Week 7)
- Misc admin (Week 7)
- Review wrap up (Week 8)
- Met w/ Craig and Paul re Carbon Waveglider transfer to PMEL; we are pulling together a set of items for potential transfer. (Week 8)
- Misc admin (Week 9)
- SRSC meeting (Week 11)
- Carbon Waveglider transfer (Week 11)
- SRSC meeting (Week 12)
- (Week 12)
- Misc admin (Week 13)
- SRSC meeting (Week 16)
- DEI committee meeting (Week 16)
- Joined EE hiring committee (Week 16)
- Misc admin (Week 16)
- Finding home for OASIS5 hardware (Week 16)
- SRSC committee meeting (Week 17)
- DEI committee meeting (Week 17)
- Carbon waveglider transfer (Week 17)
- Code review (Week 17)
- Misc admin (Week 17)
- Setting up meeting with NOAA re material transfer (Week 18)
- DEI, SRSC committee meetings (Week 18)
- proposal/budget planning (Week 18)
- SRSC committee: working on text board meeting material (Week 19)
- DEI committee: worked with group on recruitment specialist job description (Week 19)
- EE Hiring committee: job description review (Week 19)
- Proposals (getting started) (Week 19)
- Developing 2023 budget (Week 19)
- Project resourcing/staffing (Week 19)
- Carbon Waveglider transfer (Week 19)
- Misc Admin (Week 19)
- SRSC: work on challenge text (Week 20)
- EE Hire: review job description, application (Week 20)
- Misc admin: resources and more (Week 20)
- Meeting w Carbon Waveglider team & Paul M re material transfer (Week 20)
- Working on shipping Carbon Waveglider materials to NOAA/PMEL (Week 21)
- 2023 Budget (Week 22)
- Carbon Waveglider transfer (documenting, shipping) (Week 22)
- DEI meeting (Week 22)
- Misc admin (Week 22)
- Working on upcoming hires and staffing (Week 23)
- 2023 budget prep (Week 23)
- Shipped Carbon Waveglider materials, working on how to transfer solidworks models (Week 23)
- DEI committee (Week 23)
- Submitted SEE budget (Week 24)
- Hiring (Week 24)
- Allocation adjustments (Week 24)
- (Week 24)
- Attended LRAUV Simulation team meeting (Week 25)
- Hiring, budget, proposals (Week 25)
- SRSC meeting (Week 25)

- Proposal planning meetings (Week 26)
- Working on job description, hiring plan (Week 26)
- SRSC, DEI committee meetings (Week 26)
- Proposals: Precision Control, DMO support (AUV Linux port), Seafloor Mapping, Ocean Imaging (Week 27)
- Hiring/Resource planning (Week 27)
- Working on software contract (Week 27)
- Troubleshooting OASIS GPS data/instrument issue with Jared (Week 27)
- Mostly proposals this week (Week 28)
- Misc admin (Week 28)
- DEI, SRSC committee meetings (Week 28)
- LRAUV Sim telecon (Week 28)
- Proposal review (Week 31)
- Hiring (Week 31)
- Misc admin (Week 31)
- Proposal review (Week 32)
- Hiring (Week 32)
- Misc admin (Week 32)
- Hiring (job description draft release, hiring committee) (Week 33)
- 2024 staffing (Week 33)
- Misc admin (Week 33)
- DEI Committee meeting (Week 34)
- SRSC meeting (Week 34)
- Hiring (circulating draft job description, forming committee) (Week 34)
- Misc admin (Week 34)
- Resource planning (Week 35)
- EE interview lunch (Week 35)
- Misc admin (Week 35)
- Developing job description and committee (Week 37)
- EE candidate interview lunch (Week 37)
- Phase 2 resource balancing updates and meetings (Week 37)
- SRSC document review (Week 37)
- JEDI committee (Week 37)
- Phase 2 resource balancing (Week 38)
- DEI meeting (Week 38)
- Hiring : have met with various stakeholders re job description, still working to pull a committee together (all on vacation), working to organize process (Week 38)
- EE interview lunch/comments (Week 38)
- Misc admin (Week 38)
- Open Robotics lrauv sim meeting (Week 38)
- SE hire : committee mostly together, planning initial meeting and refining accumulated job description input (Week 39)
- JEDI committee meetings, reading (Week 39)
- Proposal review 2023 resource planning (Week 39)
- Misc admin (Week 39)
- Attended hiring committee meeting (DMO AUV tech); pairing w/ Tanner for SE interview section (Week 44)
- Working on SE hiring process (Week 44)
- Working on interview questions (Week 44)
- New release of engineering labor spreadsheet from latest accounting data (Week 44)
- Hiring (Week 46)
- Met w/ Brian and Open Robotics re LRAUV sim troubleshooting (Week 46)
- Hiring committees (3) (Week 48)
- Misc admin (Week 48)

- Interviews (2) for AOSE (one was an applicant to SEE-DA, so some progress there) (Week 49)
- Interview for LRAUV tech (Week 49)
- Code reviews (Week 49)
- Interview and committee meeting for AOSE roles (Week 51)
- Scheduling phone screenings for SEE-SD role (Week 51)
- Preparing for annual reviews (Week 51)
- Annual CalChamber harassment management training (Week 51)