Thom Maughan Sorted By Project

300083 - DMO Support - LRAUV

- Power Savings concept for instrument servicing on LRAUV. Selected a 6 serial port ARM processor for the proof of concept that has a code base and tool chain I've used before. (Week 6)
- Hardware design has 5 uarts with one multiplexed to 4 for a total of 8 uarts. Working on design/layout. (Week 7)
- Small progress on the hardware design (Week 8)
- NTR (Week 9)
- Small progress on hardware (Week 10)
- Working on hardware design, goal is to send the board out next week. (Week 12)
- This has been my primary focus. Design and layout are nearing completion (added some additional features to make the design useful for MFET testing). Last task is the hibernate / power control circuit. (Week 13)
- Prepared pcb fab package for 'DAg', the data aggregator, and during that process found a problem with the hibernate circuitry. Have now addressed that issue and am working on updated layout and fab package. (Week 14)
- Debug and setup of MFET board, made power consumption measurements. (Week 15)
- Finished the design and layout. (Week 15)
- Sent out for pcb quote (Week 15)
- Parts BOM (Week 15)
- Design Review slides (Week 15)
- Pcb fab is complete, boards received. , Dropped parts, pcb and stencil to Indtec (Week 16)
- Worked on design review slides, had phone call with proj mgr (Week 16)
- DAg is at Indtec getting assembled, pickup planned on Friday. (Week 17)
- Working on review materials. (Week 17)
- Expense report (Week 17)
- DAg hardware bringup is moving along. Worked around the missing 0.1 ohm resistor for now. (Week 18)
- Working thru pin muxing. Was hoping to get board bringup done then move onto other projects (Week 18)
- Little progress on DAg due to other projects (Week 19)
- Sent out DAg design review slides to get feedback, updating to address feedback (Week 21)
- Resolved a PO issue for payment to Indtec for work done in April (Week 24)
- Buffered serial driver, extending to 7 UARTS (Week 36)

901009 - CANON

- eDNA HiPP. Met with Francisco on project priorities. Looks like the eDNA work needs to be moved up. (Week 6)
- Itemizing software packages in the eDNA to speciesID workflow to see what is open source and readily available, what is distributed binary for ARM, what has GPU acceleration, etc. (Week 7)
- Ordered eDNA minion ligation kit (Week 7)
- Ordered MinION sequencer on the 13th - order has not shipped. Probing Oxford to try and unstuck it. (Week 8)
- HiPP::eDNA. Installed MinION software on x86+GPU laptop. Working to borrow a MinION. (Week 8)
- Researching best package options for ARM build of BLAST tools, ideally with GPU support. (Week 8)
- Received MinION desktop DNA sequencer! (Week 9)
- Found a procedure for ARMv8 / ThunderX2 build of BLAST. (Week 9)
- Identified several source packages for GPU accelerated BLAST (server), selected one. (Week 9)

- Met with Nate and Francisco to align on high level priorities and tasks. Working on a presentation to better educate on what HiPP entails from a hardware and software perspective. (Week 9)
- 'Big' literature search for genomic software tools used for sequence lookup in database for taxonomy id. Found some interesting papers, algorithms and benchmarks. Discussed with Nate who helped decode the lingo. Talked with Katy and Jacob about their tool usage - quite a diversity. (Week 9)
- Email discussion with Mike Vella of NVidia on the approach for running taxonomy id tools on TX2/Xavier. (Week 9)
- Working with Nate to get a benchmark fasta file that takes about an hour to process on the VM cluster with BLAST with the full genome database. (Week 9)
- Working on project kickoff slides. (Week 9)
- Working with Nate to get a benchmark fasta file that takes about an hour to process on the VM cluster with BLAST with the full genome database. (Week 10)
- In progress getting BLAST and cross compile setup. (Week 10)
- Working on project kickoff slides. (Week 10)
- Have picked up both of my GPU enabled laptops for work at home. (Week 12)
- Work Plan: benchmark fasta file for BLAST on x86 architecture with 6 cores, next will be GPU-BLAST x86+GPU, then onto BLAST on ARMv8, then GPU-BLAST. (Week 12)
- Met with Nate on Slack video to go over his new workflow that he got from collaborating with Stefan Prost - can't wait to get started. (Week 13)
- Added Fred Bahr as user on DeepDark, some big crunching planned for CENCOOS. Coordinating access with Paul McGill who is actively using the GPU server. (Week 13)
- Little progress on BLAST recompile for ARM. (Week 14)
- Working on BLAST for ARM (Week 15)
- Attended BOG meeting. Working on GPU enabled PC options (Week 16)
- Small progress on BLAST (Week 16)
- Scheduled meeting with intern to discuss options (Week 16)
- Nate and I met with Raksha Doddabele to discuss remote internship. Nate did an amazing job of explaining CANON and the BOG lab - kicking myself for not recording it. Duke is finishing classes next week. (Week 17)
- Working on GPU purchase options for Francisco's group. (Week 17)
- Setup an Amazon AWS free tier account (no GPU) to get a wiff of the tools. Requested and received approval to pay for a GPU instance. (Week 17)
- Setting up a HiPP account on AWS and working thru configuration options (Week 17)
- Setup of AWS Amazon high performance compute server. This server is for working with my intern. Getting gentle pressure from the project manager. (Week 18)
- No progress at all on BLAST cross compile, none, nada, in order to work on AWS (Week 18)
- HiPP::eDNA project and early arrival intern. (Week 19)
- Ran thru tutorials and setup 'free instance' of AWS Amazon. Duplicated the procedure and with some excellent support from Amazon during an 'all nighter' have the GPU server hardware provisioned and ubuntu 18.04 with a deep learning software stack all setup. (Week 19)
- Usage cost is worse case 24/7 $1k / mo. We should be able to manage this and hit around half that. (Week 19)
- Found out the hard way that project schedule pressure is high and apparently there is not time to run thru tutorials and climb the learning curve on Amazon. PM able to raise priority and have Kevin Gomes step in to help out setting up the user accounts. I think a kickoff meeting is needed for the project to improve communications. (Week 19)
- After the smoke clears, will suggest we setup a cost effective 'play and learn' non-GPU server for the interns in the BOG lab that are also requesting access to the Amazon server. (Week 19)
- Working with Duke intern Raksha Doddabele, had first zoom with her and Nate. (Week 19)
- Nate has been working with Raksha while I've been out of commission. (Week 20)
- Doug/Will prep'd an older PC with GPU card (Week 20)
- Changed from BLAST to MiniMap2 for local alignment. MiniMap2 has a much faster search algorithm, has better open source support / update, source tree has ARM v8 build target. (Week 21)

- Reading papers (Week 23)
- NVidia GTC presentations (Week 23)
- MiniMap2 (Week 23)
- Meetings with intern Raksha (Week 23)
- Starting minimap2 and cudamapper install on embedded arm+gpu (Week 26)
- Prep for meeting with John Zicker. (Week 28)
- Need to figure out how to cover costs of AWS GPU server. (Week 28)
- Set up Xavier NX board for install of minimap2 package and dependencies. (Week 31)
- Xavier setup. (Week 32)
- Working with intern Raksha, mostly review of slides. Nate Truelove did a fantastic job with Raksha while I was on vacation. (Week 33)
- Working with Raksha on benchmarking cpu and memory for minimap2 (eDNA sequence aligner) on Amazon AWS Server. Looking at cost reduction options for moving to a less capable EC2 instance and also scoping the resources required for embedded ARM. Things are looking good for using Xavier NX. (Week 34)
- Many thanks to Kevin Gomes for walking me thru two factor authentication to boost security on AWS. (Week 34)
- Investigating board options for multi-core ARM (4 core min) with RAM > 8GB (Week 36)
- Received and reviewed the kickoff materials for the automated eDNA processing work with Johns Hopkins. Sent introductions and info on prospective embedded platform. (Week 38)
- Spent an afternoon with Amazon AWS trying to get the fasta files off the server by setting up an s3fs… The S3 web interface did the trick. Was hoping to turn off the AWS server at end of month but it looks like Chavez lab may have other uses for it. Thanks to Kevin Gomes for AWS devops assist. (Week 38)
- Installation procedure for minimap2 on linux laptop. Ran benchmarks on Nate's eDNA basecall data. Deep6 laptop outperformed AWS! (Week 38)
- Meeting with Nate to go over latest eDNA processing workflow. (Week 38)
- Attended first meeting of the dry processing team, which include biologists at Johns Hopkins APL. Setup a slack channel for team and direct messaging. (Week 39)
- Working on eDNA embedded pipeline. Recompiled minimap2 for ARMv8 with neon. Ran benchmarks with 2 cpu core on Xavier NX (6W, 481sec). Same benchmark runs 200 sec on AWS EC2 with 16 cores and 112 GB RAM. (Week 39)
- Started to add NVidia Jetson software one package at a time which got to be a slog. Went ahead and installed the entire Jetpack. Footprint optimization will come later. (Week 39)
- Working on Oxford Nanopore MinIT software (guppy, etc). Working with Oxford Nanopore (Week 39)
- Working to get Oxford Nanopore basecalling software running on the Xavier, hitting some roadblocks, working with support. In the meantime, setting up a TX2 with older ubuntu and dependent components to be compatible with ONT MinIT in hopes that might solve the problem. (Week 40)
- Optimizing clock speed and cores for running alignment software. (Week 40)
- Sent 'power aware computing' cable and power supply to collaborator at Johns Hopkins (Week 40)
- Attended the 'dry processing' meeting and after a productive meeting on the embedded workflow, JHU folks showed some of the Monterey C1 DNA data - I'm hooked! (Week 40)
- Tried the Oxford Nanopore basecalling package install on TX2 with Ubuntu 18.04 - still having problems even with the alternate procedures from ONT support. Next step is to try on Ubuntu 16.04 on the TX2. (Week 41)
- Ran into connection / access problems with the ONT MinIT. Looked like a connection problem so invested heavily in diagnosing that. Turns out is was documentation errors on the ONT website. Working to come up to speed on running the MinIT and looking at the installed software. (Week 41)
- JHU/APL sent me a tweet from Italy where someone had the basecaller running on a TX2. Tried to make contact. Further investigation led to a group in New Zealand doing the same thing as I'm trying on the Xavier. They made daily progress reverse engineering and recompiling packages and have had some success. I'm going to follow their notes and see how far I can get on Xavier NX. (Week 41)
- Benchmarked power and execution time for the eDNA aligner software on Xavier NX and TX2 in various power and core configuration modes. (Week 41)

- Learning how to operate the MinIT for DNA sequencing. Coming up with procedures that can be used to verify operation of the MinION. Ran minimap2 benchmark on MinIT. (Week 42)
- Xavier NX. Software forensics on the MinIT to determine what packages are installed by Oxford Nanopore. Working to install / rebuild source packages from the ubuntu 16.04 MinIT to 18.04 on the XavierNX. Plan is to use wireshark to try and snoop the commands sent by the remote GUI via wireless as a guide to writing scripts that do the same thing for a headless system. (Week 42)
- Coming up to speed on the many command line options for Guppy. Latest version has a more advanced LSTM neural net that improves the insert/delete (indel) errors by a couple percent. (Week 42)
- Worked a plan B approach on a Jetson TX2 running Ubuntu 16.04 in case the XavierNX effort gets stuck in the ubuntu up-port mud. (Week 42)
- Attended meeting with Johns Hopkins, top level and dry side. (Week 43)
- Reverse engineering the MinIT software, MinKNOW gui is running on XavierNX but having trouble connecting to the MinION (dna sequencer) due to permission issues on USB and some missing pieces. Working on startup of backplane daemons and got a helpful pointer from Erik T on systemd. (Week 43)
- Working to identify all the helper apps in order to script a commandline / headless version of the GUI. (Week 43)
- Bio-informatics workflow on XavierNX - getting close, but still working thru issues with MinKNOW gui recognizing Minion dna sequencer. (Week 44)
- 2TB ssd setup and configure for ONT workflow (Week 44)
- MinKNOW gui is running on XavierNX. Sat with Nate to collect UI usage. We are setting up for a MinIT vs XavierNX bakeoff next wednesday. (Week 45)
- Attended meetings with Johns Hopkins APL, shared procedures and notes for setup. (Week 45)
    - Working on inclusion during zoom calls. (Week 45)
- Working to capture process spawning with arguments and to gen up a serial port controlled commandline app to start, pause, stop DNA sequencing. (Week 45)
- Working on procedure for install and setup, sharing on open source effort (Week 45)
- Refining and documenting install and setup procedure for XavierNX run of MinKNOW (Week 46)
- Sent one of the XavierNX systems to JHU/APL for power and performance benchmarking of the final steps in the bio-informatic workflow. (Week 46)
- Setup a XavierNX unit in the guest lab for Nate to use in a eDNA sequencing bake-off with the MinIT. (Week 46)
- Attended meetings with Johns Hopkins APL. (Week 48)
- Demo unit of Xavier NX based desktop sequencing, aligning and organism identification system delivered last week to the guest lab for Nate to run a bake off with ONT MinIT. System power measurements peak at 30W. (Week 48)
- Sending input to final 2020 report (Week 48)
- Setting up development system with protective case and battery circuit. The near term need for next year is backup battery to withstand brief power glitches / outages while on ship. (Week 48)
- Assembly of Truelove-M shipbox portable eDNA analyzer into Black Friday Harbor Freight pelican case knockoffs. (Week 49)
- Tina at JHU is running into software package porting challenges for packages compiled for ARMv8 used in the classification step. She is exploring other options, attempted to assist with the recompile. Other software is hitting memory limits. The classification step may need some development for embedded ARM. (Week 49)
- Helping out with MBARI - Johns Hopkins APL report on embedded system for eDNA analysis (Week 50)
- Handed off box and components for proto of portable eDNA sequencer with Xavier NX system for use on ship. (Week 50)
- Helping out with MBARI - Johns Hopkins APL report on embedded system for eDNA analysis (Week 51)
- Handed off box and components for proto of portable eDNA sequencer with Xavier NX system for use on ship. (Week 51)
- eDNA ship box system (Truelove-M v1) parts are with Paul Coenen. (Week 52)
- Wiring and testing battery backup system. (Week 52)

901713 - Nearshore FOCE

- I was added to the nsFOCE project (6 days) 29 Jan 2020 to add conductivity sensor support and to assist the FOCE team with MFET use. Working this project on off-Fridays in exchange for comp time. (Week 6)
- Added protocol to support MFET Labview GUI development with Optode and Conductivity simulated. Delivered to Dale, a couple things found and fixed. (Week 6)
- Scoped M2M protocol and data format to ease future integration - this will be put on the enhancement request for future. Plan for delivery is similar to what is done for the Glider integration. (Week 6)
- Updated the protocol and simulated data format per Dales feedback. Work in progress. (Week 7)
- Sensors should be in end of Feb. (Week 7)
- Working on Aanderaa sensor provided by Joseph, Working with techs on wiring. Comp=2. (Week 8)
- Added a delimiter to aid Labview message parsing. Scoped making a m2m protocol, but that's too much work for the near term. Dale is fine with what has been delivered (Week 9)
- Getting Bridget setup with CCS and source code so she can get experience with MFET and Aanderaa sensors. (Week 9)
- Comp=2. (Week 9)
- Added a delimiter to aid Labview message parsing. Scoped making a m2m protocol, but that's too much work for the near term. Dale is fine with what has been delivered (Week 10)
- Getting Bridget setup with CCS and source code so she can get experience with MFET and Aanderaa optode and conductivity (Week 10)
- Comp=2. (Week 10)
- Picked up my MFET/MCAP along with cables and the Aanderaa conductivity sensor. (Week 12)
- Working on polled settings for Aanderaa Conductivity sensor. (Week 12)
- Attended nsFOCE meeting (Week 16)
- Picked up optode sensor from MBARI. (Week 18)
- Setup the board and sensor for development, some work to do on connectors. (Week 19)
- Retrieved MFET boards from Scott/Jose. Grabbed Dales board as well. (Week 23)
- Sent email for the meeting giving status on MPHOX (Week 26)
- Attended meeting, gave status. 38 MpHOx boards from Indtec are ready for pickup. (Week 31)
- Conductivity sensor setup, trying to get the sensor wired. (Week 32)
- Cable for Aanderaa conductivity sensor to PC for config of sensor is ready except for DB9. (Week 33)
- Connectors have been received for building config cable for conductivity sensor. (Week 34)
- Working on a config option to disable the filesystem. (Week 34)
- Sent status to the nsFOCE team. (Week 34)
- Sent status. (Week 36)
- MpHOx board checkout. Software mods for nsFOCE. (Week 36)
- Attended meeting. Plan is to work on nsFOCE towards end of Oct. (Week 41)
- Planning to get started again on nsFOCE next week. (Week 45)
- Borrowed a cable for the Aandara conductivity sensor config. (Week 46)
- Borrowed a cable for configuring the conductivity sensor (thanks Chrissie). (Week 48)
- I have cables and sensors here at my home office (Week 49)
- Delivered an MpHOx and and MCAP (no serial number) to Jim Montgomery for housing fitment. (Week 50)
- Delivered an MpHOx and and MCAP (no serial number) to Jim Montgomery for housing fitment. (Week 51)

901805 - Coastal Biogeochemical Sensing

- DeepSeaDurafet, aka, nanoFET: Selected a processor and worked through the pin mux / signal assignment to help software compatibility by doing a proto design schematic. (Week 6)
- Reviewing ADC options for performance and long term silicon availability. There is an updated version of the ADS1248 that is mostly compatible. (Week 6)
- Handed off processor and pin assignments to Scott. (Week 6)
- Working on bias battery measurement (Week 6)

- In progress adding bias battery measurement. It's coded, needs testing. (Week 7)
- Working on DeepSeaDurafet, aka, nanoFET design. Looking deeper at software porting and pin muxing. (Week 7)
- Bias battery voltage read routine has been added and tested. (Week 8)
- Began implementing configurable status message protocol (Week 8)
- Talked to Brent, next Glider deployment is in April. (Week 9)
- In progress on configurable status message protocol (Week 9)
- Configurable status protocol (Week 10)
- Gave Scott the pin definitions for the nanoFET. (Week 12)
- Working on automated test hardware design. Have added a few features to the LRAUV data aggregator (DAg) to make it useful for MFET automated testing. (Week 13)
- Email conversation with Yui about combining in some of the nanoFET features into DAg and doing a cost share. He is supporting that. Implemented isolated serial for the 8 channels and have the 24bit ADC along with some storage options (on board NAND and FRAM). (Week 14)
- Scott and Jose are starting up on the npHOx design, gave comments (Week 15)
- Sent the lrauv DAg board schematic since it had a number of npHOx features implemented (Week 15)
- Discussion on power consumption, npHOx desing (Week 16)
- In progress on pre-nanoFET software dev using a launchpad board and DAg (Week 18)
- Re-structuring the source code for a processor variant. (Week 18)
- Working to add support for processor variant and peripheral mix to the code base. (Week 19)
- Reviewing Yui's paper. (Week 20)
- Small amount of progress on pre-nanoFET (DAg) firmware dev. (Week 20)
- DAg design review slides. (Week 21)
- Working on board bringup. Slow going due to small things like connector availability for serial and jtag. (Week 21)
- DAg / pre-nanoFET dev. Ordered connectors (Week 23)
- Discussion with Yui, proposals (Week 23)
- Picked up two MpHOx boards. Worked Sat. and Sun on board bringup. (Week 24)
- DAg board on hold, working on board bringup of MpHOx (Sat/Sun) (Week 24)
- Big push on board bringup for the MpHOx boards for go / no go on building 38 more boards. (Week 25)
- (Week 25)
- Primary focus has been on MPHOX to gate the assembly of 38 boards. MPHOX board bringup is complete (yeah!) and no issues found with pcb/layout or design. We had some issues arise during integration test that turned out to be a tiny component installed backwards - the little things can bite. (Week 26)
- Scotts trip was delayed, so he took over the integration test and noise analysis for the pump-isfet interaction. (Week 26)
- Reviewing bug and feature list. (Week 26)
- Going thru the MFET/MCAP boards that have been reworked. Some are bad, some work fine except they don't sleep. Working to root cause the problem. (Week 32)
- Checkout and failure diag of MFET/MCAP (Week 33)
- MpHOx board test procedure / testing of 38 boards. Will try to offload some of this testing to Joseph. Boards are testing well so far. (Week 33)
- Meetings with Joseph and Yui. Yui outlined project needs for 2H2020 (Week 33)
- Board checkout on the MpHOx boards, so far so good. I should be able to offload this task as I've got a test procedure written. (Week 34)
- Meeting with Yui and Joseph on MFET / MpHOx board status. Scott provided a hardware change list to help with the versions, very helpful. Discussed lessons learned and we are tightening our process for numbering and tracking the boards. (Week 34)
- Working on support for MFET revA with MCAP revC to get MFETS for a deployment. (Week 34)
- Went back thru some of the MFET boards that failed and found a jumper had been installed on the reworked boards that was preventing deep sleep. We should have boards to build instruments now. (Week 34)
- MFET sleep issue on some boards resolved (Week 35)

- Went thru the reworked and broken MFET boards - delivered 6 partially tested boards to Joseph (Week 36)
- Meetings and discussions. Document procedure for board checkout with a focus on the analog simulator. (Week 38)
- Meeting with Yui and Joe to discuss software updates needed for MFET and MpHOx. (Week 40)
- The new nanoFET board was sent out for fab by Scott, expecting boards back mid-Oct., planning board bringup in latter weeks of Oct. (Week 41)
- nanoFET board is in assembly, scheduling board bringup for next week, possibly the following. (Week 42)
- npHOx board is in assembly and expecting to get one for preliminary board bringup. Planning to work 2 days next week on the project. (Week 43)
- Worked with Scott to diagnose two failed MFETs. FIxed one, the other is likely ESD damaged after deployment. (Week 44)
- The laptop used (personal) for development is dead, setting up on an older machine for now. Newer ver (Week 44)
- PIcked up an npHOx, new board, from Scott. Got setup for development at home. Evaluating move to CCS v10. (Week 45)
- Installed CCS v10.1, evaluating a move from CCS v7… "Houston, there are problems" in that projects error on import. Working with CCS team (Week 46)
- Fetched MpHOx hardware to prep for possible travel quarantine (Week 46)
- Working thru setting up a new laptop with code composer studio. Evaluating a move from CCS7 to CCS10. Worked thru a few hiccups. (Week 48)
- Working on MpHOx and NpHOx and feature list. (Week 48)
- CCSv10 compile and test on MFET for v3.3.1 (Week 49)
- Working v3.4 to add support for nphox and mphox boards (Week 49)
- Discussed requirements for a point release v3.3.2 (Week 49)
- UV-C flashlight (duty cycle, period) for bio-fouling mitigation on sensors. Verify effect on sensors (Week 50)
- Getting set back up for development after project shuffling. I've got a desk space limit. (Week 50)
- UV-C flashlight (duty cycle, period) for bio-fouling mitigation on sensors. Verify effect on sensors (Week 51)
- Getting set back up for development after project shuffling. I've got a desk space limit. (Week 51)
- UV-C test design sketch, parts ordering (Week 52)

902000 - Multi-Spectral StealthCam

- EE is working to finalize the hardware and have the board made soon. (Week 6)
- Project deployment goal was set for mid-May, along with most of my other projects (Week 6)
- Stared coding to add a 4th PWM output and hit a number of complexities that exceed the time allotted. (Week 6)
- Discussed with Proj. Mgr about adding a plan B for PWM. Found an i2c 4 channel PWM device in a small package and worked with Jose to assess layout impact - he had it added and the entire board layout complete for review by end of day. Working to ensure compatibility with the LT3476. (Week 6)
- Working with Bridget Benson on four channel PWM using TCC module - she got it working and verified pin assignments (Week 7)
- Updated the PWM pin assignments on the StealthCam layout (thanks Jose) for atsamd21g18a (Week 7)
- Hardware is getting close to going out for fab. Will prep a board bringup app and work with Bridget as the hardware is likely coming in while I'm on vacation. (Week 8)
- pwm board bringup code. Simple protocol definition. (Week 9)
- Added the sensor node firmware task this week. Four serial config'd and tested, only needed 2. (Week 9)
- pwm board bringup code. Simple protocol definition. (Week 10)
- Sensor node pin assignment (Week 10)
- NTR (Week 12)
- Bridget has made some progress on serial command interpreter for setting PWM values for board bringup. (Week 13)

- Responded to Chads email. Planning to drop a Feather M0 I bought for St. Helena to Bridget so she can continue. (Week 16)
- Picked up hardware from MBARI so Bridget Benson can continue working in prep for board bringup. Have not heard status on hardware. (Week 18)
- Bridget handed off the code she developed for Feather M0. Testing, reviewing. (Week 19)
- Received boards from Jose. Ordered connectors. Next step is bootloader and board bringup. (Week 23)
- Picked up Stealthcam boards. Ordered connectors, delivered to MBARI. Requested access to MBARI Thurs for pickup. (Week 24)
- Working on wiring JTAG connection to TagConnect to flash bootloader (Week 26)
- LED Driver board bringup. Step 1: JTAG interface cable to burn bootloader - regretting not pushing to use a connector that is compatible with Atmel-ICE. (Week 33)
- Spent a couple hours working on burning bootloader, debugging whether it's the JTAG connection, emulator, or the board. (Week 34)
- Attended meeting (Week 35)
- I have the PWM boards here at my remote office. (Week 49)

902004 - Planktivore

- Project management (Week 6)
- Working with Bridget Benson on embedded linux software development for TX2. She is up and running on the TX2 with GC2450 camera and working on dependent components install for the app. (Week 6)
- In progress on LED ring illuminator design. Parts purchasing, footprints and prep for test boards for light and pressure testing. (Week 6)
- Working with Bridget on software framework. She has a TX2 configured and tested with the towbody GC2450. Next step is adding the FLIR Blackfly support, (Week 8)
- NTR (Week 9)
- Working with Bridget (Week 10)
- Duane Edgington gave an update on Taxonify eval (Week 10)
- Picked up from MBARI a Jetson TX2 (Week 12)
- Researching LED lighting (Week 15)
- Attended EyeRIS review (Week 15)
- Working on revised project plan update (Week 16)
- Budget forecast / re-base to accommodate impact due to covid19 pandemic. Provided input to Cindy. (Week 17)
- Working on design sketch of lens and lighting adapters / mounts for Fluum. In touch with Larry Bird (Week 17)
- Working with Bridget Benson on replicating software install for TX2 (Week 19)
- Meeting with Henry, Francisco, Paul to discuss CENCOOS funding opportunity (Week 20)
- Working on abstract presentation (Week 20)
- Meetings, working on abstract and presentation. (Week 21)
- Phone call with Larry Bird to get status on Fluum and to request help getting quote for 3D printing remaining parts. (Week 21)
- Bridget has BSP installed and Blackfly camera is running on ConnectTech board (Week 23)
- Preparing waveglider towbody for test. Work to do on wiring harness, TX2 is prepd. (Week 23)
- Working plan for CENCOOS 2020 project modification. Working on finding contract resources for housing / mechanical (Week 23)
- Worked on abstract presentation and CENCOOS build plan. (Week 24)
- Met with Paul to discuss lighting and camera options for potential CENCOOS build. (Week 24)
- Working to find ME contractor for housing design. (Week 24)
- Sent a note to Jon Erickson asking if he could use his 1 week to review housing contractor work products (no response yet). (Week 24)
- Putting together a work plan for a build plan and estimate for CENCOOS with follow-up with MTeam. (Week 24)

- Meeting with Annette Stahl, Aya Saad, Kanna Rajan of NTNU to review plankton imaging results from LAUV. Very helpful to see their results and to understand the challenges with tuning the optics and lighting. Very grateful to have Paul's experience and expertise. (Week 25)
- Working to get quote on housing for CENCOOS funding. This has been challenging as there are a number of details that need to be figured out before getting a firm quote. Working with a good candidate though. (Week 26)
- Working on ph1 proposal, getting quote on housing design (Week 28)
- Reviewing Scripps Zooglider paper. (Week 31)
- In progress on SOW for housing and bracket ME contractor quotes. The goal is to get three quotes, but this may be challenging given the times. There is a possibility of getting some design files for Zoocam from Scripps. (Week 31)
- Working on design of optics and lighting, looking into global shutter camera option. (Week 31)
- Looking into carrier boards and camera interface options for Xavier NX, if we can get two USB 3 connections that would be ideal. Contacting ConnectTech to see what it would take to modify one of their carriers. Also researching global shutter machine vision cameras for other interface options. (Week 33)
- Installed Solidworks free viewer. (Week 33)
- Hunting for contractor options for housing. (Week 33)
- Met with Paul Roberts on Friday. Helpful on many fronts especially on lighting design. (Week 34)
- Fluum is in working order - Larry has done an awesome job! Flow rate is less than 1m/s but should be fine for prelim testing. Looking for a low voltage (12v/24v) drive motor with PWM control - fish trolling motor might be an option (0 to 300 rpm). (Week 34)
- Have contacted three contractors and will be working RFQ as soon as possible. (Week 34)
- Instituted status reporting on Slack (Week 34)
- Have received solidworks files for ZooCam from Scripps via Paul R. and Francisco. (Week 35)
- Working with Larry on Fluum motor upgrade for higher rpm and lower voltage (24v for safety). Researching flow indicators (glass beads, mica). (Week 36)
- Working with Larry on Planktivore housing, looking at optical path layout, improvements for manufacturability, proto for Fluum, etc. This effort will help with outsourcing the design and fab of the housings. (Week 38)
- Meeting with Larry and Paul to go over proposed changes to the Scripps housing design. (Week 38)
- Started ordering hardware for the compute module. (Week 38)
- Camera review for global shutter to simplify the optical path. Good candidate has been identified from FLIR with the imx250 imager. (Week 38)
- Project planning (Week 38)
- Meeting with Larry Bird to go over changes for the Planktivore housing design. (Week 40)
- Working camera selection, carrier board selection, wiring plan, first proto lighting and connector. (Week 40)
- Submitted board bullets. (Week 41)
- Reviewed spend plan for compute, cameras and optics with Paul (Week 41)
- Great meeting with Larry and Paul on the microscope housing. We worked thru a few tradeoffs and Larry has a good set of requirements for the first housing iteration. (Week 41)
- Larry submitted housing optics bench design to the 3D printer and I will work with Aaron on mirror mount while he is on vacation. The plan is for Larry to work on the microscope housing design when he returns from vacation and is in quarantine. (Week 41)
- Project management, budgets, spend plan. (Week 42)
- Board slides, board bullets. (Week 42)
- Ordering cameras, compute, fast ssd, etc. (Week 42)
- Larry Bird has the requirements and guidance for the first iteration on housing. He will be working on it when back from vacation and in 2 week quarantine. (Week 42)
- Met with Annette Stahl of NTNU on lighting options for LAUV plankton microscope. (Week 42)
- Ordered 2 of the 4 FLIR Blackfly S imx264 cameras. Also ordered USB3.1 hubs and fast SSD. (Week 43)
- Located the flow meter for integration with Fluum. (Week 43)
- Board bullets, board slides, project update on Slack. (Week 43)
- Optics bench design, Fluum mount, parts ordering (Week 45)

- SSD speed eval of Gen4 vs Gen3 PCI nvme on XavierNX. (Week 45)
- Project mgmt overhead - budgets and projections, CENCOOS mk2 meeting. (Week 45)
- Charge coding (Week 45)
- Meetings on the housing design - it's moving forward nicely. First iteration will be LED flash on the inside of the faceplate. (Week 46)
- Optical bench design and purchasing. (Week 46)
- Year end ordering (Week 48)
- Optical bench design for Fluum and desk (Week 48)
- Examining the plan for upgrading the storage on DeepDark escalated to a proposed 'better path' of building a new GPU workstation with support for latest Cuda version and large amount of CPU cores for eDNA and Image workflow processing. Reviewed with the DeepDark users, Henry Ruhl and Francisco. Requested $9k of discretionary funds from Chris Scholin. AMD 3990x with 64 cpu cores, 256 GB RAM, 2x RTX 8000 with a total of 96GB GPU RAM + fast 4TB SSD and RAID drive setup for 32TB storage. (Week 48)
- DeepRip (AMD3990x 64 core + 256 GB RAM + 2x RTX8000 +2x 48GB DDR6 + 8 TB SSD + 32TB RAID disk + case + cooling + power supply) purchasing and expensing. Many thanks to Cindy. Scheduling build by Jose. (Week 49)
- Project management (Week 49)
- Larry is shifting from housing design to fabrication for other projects as he can work housing design from home. (Week 49)
- Telecentric lens order had greatly reduced tariff. (Week 49)
- DeepRip proposal (thanks to all), funding discussions, parts ordering, part re-ordering, etc. DeepRip: AMD 3990x 64 core cpu + 256 GB RAM + SSD + 2x RTX 8000 Quadro with 48GB RAM each. (Week 50)
- All parts should be received this week, and we can perhaps make special requests the following week. Met with Jose on the build. He raised some very good points on the cooling I want and the challenges with the selected case. We are ordering a better one and making a return. (Week 50)
- DeepRip proposal (thanks to all), funding discussions, parts ordering, part re-ordering, etc. DeepRip: AMD 3990x 64 core cpu + 256 GB RAM + SSD + 2x RTX 8000 Quadro with 48GB RAM each. (Week 51)
- All parts should be received this week, and we can perhaps make special requests the following week. Met with Jose on the build. He raised some very good points on the cooling I want and the challenges with the selected case. We are ordering a better one and making a return. (Week 51)
- Resolving DeepRip build issues with Jose. We have returns in process. (Week 52)
- Year end budget. (Week 52)

Out of Office

- Mar 12 - Mar 30 Vacation (St. Helena with Georgia Aquarium)
- Mar 11 - Mar 25 Vacation (St. Helena with Georgia Aquarium) (Updated)
- Mar 11 - Mar 25 CANCELLED Vacation (St. Helena with Georgia Aquarium) (Updated). Last week, I was due to travel to St. Helena for the last chance to deploy the whale shark tag for the Georgia Aquarium. After researching covid19 and doing a risk assessment, I first paid to delay my departure flight by 12 hours, then cancelled the trip. Shortly after cancelling the WHO issued the Pandemic warning and the escalation of concern finally hit the White House.
- Working at home and planning to drive to MBARI to feed Rascal the cat twice a week.
- Working at home and planning to drive to MBARI (no building access) to feed Rascal the cat twice a week.
- In my off time, putting 3D printers to work printing face shields for first responders, working with folks from NPS and local high school robotics teams.
- In my off time, putting 3D printers to work printing face shields for first responders, working with folks from NPS and local high school robotics teams. Handed off samples of the various faceshields to a nurse from CHOMP for their ER meeting. Received 400 surgical masks from China - handing out to local stores, volunteers, family and friends.
- Dealing with multiple family challenges both here and remote.. Unsettling times making it hard to work.

- Attended zoom of MontereyBayMakers, managing Slack space, Glen tending the printer, as a group of over 50 we are on track to 2000 faceshields. Talked briefly with Dale Graves about how printing PPE is not a good fit for MBARI machines
- Working at home and not needing to drive to MBARI as MLML is feeding Rascal
- Colorado family situation is improving some.
- Attending weekly zoom of MontereyBayMakers, managing Slack space, Glen tending the printer, as a group of over 50 we are on track to 3000 faceshields printed and delivered. Working to engage laid off MBA employees.
- Went to MBARI to pickup a few things. Grabbed my Tektronix scope and a misc connectors, usb-serial boards, etc. Also grabbed Bridgets MBARI laptop, her dev boards, and her Cal Poly surface. Rascal the cat was happy to see me, he is being fed, I fed him dry food.
- Planning to take a day or two vacation to help layed off MBA staff get networked into montereybaymakers.org.
- Went to MBARI to pickup a few things I missed the previous time. Retrieved all Bridget and Daniels Cal Poly hardware as well as some missing 'pieces'
- Planning to take a day or two vacation in the next week or so to help layed off MBA staff get networked into montereybaymakers.org.
- Went in for second shingles vaccine on Tuesday. Not feeling well on Wed (sick day).
- Sick days (=2) for shingles vaccine recovery. This followed by allergies (sick = 1.5)
- Tentative vacation plan is after abstract presentation to take a week, possibly more depending on pandemic rules.
- Tentative week to ten days road trip plan is second week in June after school gets out, abstract presentation from the road possibly. Depending on pandemic rules.
- Tentative two week road trip planned. Starting mid-June after school gets out, abstract presentation from the road possibly. Depending on pandemic rules.
- Two week road trip planned. Was trying for mid-June, now delayed. Depending on pandemic rules.
- Two week road trip planned. Plan is July 1 to July 21, road trip plus some time in Colorado to help out.
- Vacation Plan is June 30 to July 21, driving to Colorado to help out family. Revised: Plan is to work for 1 to 3 days per week remote from Colorado as it is unrealistic to get Proposal materials complete before departure. Several projects are easily transportable. (4.5 comp).
- Vacation Plan is June 30 to July 21, driving to Colorado to help out family. Plan is to work for 1 to 3 days per week remote from Colorado as it is unrealistic to get Proposal materials complete before departure. Several projects are easily transportable.
- Returned from vacation on Jul 23
- Working remote. Travel quarantine ends 7 Aug 2020.
- Working remote. Travel quarantine ended 7 Aug 2020.
- Trying to figure out a schedule for regular access to MBARI and to figure out lab space for Planktivore and Fluum testing.
- Working remote. On campus Thurs / Fri last week in the afternoon.
- Working remote with regular access to MBARI planned Tues,Wed,Thurs for a lab in bldg g
- Working remote with regular access to MBARI Tues,Wed,Thurs
- Working remote with regular access as needed at MBARI Tues,Wed,Thurs
- Two days (Nov 19,20) vacation to help document and deploy a smart camera system at the Cal Poly Pier. Working from home on quarantine due to travel until Dec. 3. Have all the equipment I need for Planktivore and Coast BioGeoChem.
- Vacation Dec 10 to 15
- Quarantine from visiting Cal Poly Pier ends on Dec.3
- Vacation Dec 10 to 15 - Fence project with family labor.
- Vacation Dec XX to YY TBD on dates. Likely a two week.
- Vacation Dec 24 to Jan 1 TBD on dates.

Overhead

- Contingency project is finishing the build of bio-electric field instrument (Week 6)
- Hosted 35 Cal Poly Biology students for a tour on Friday 31 Jan 2020. Former intern Gabe Santos drove up to assist. Met with Gabe on our Pier Peer project (Week 6)
- Trygve Fossum and Tore-Mo Bjorklund from NTNU meeting - discussion on collaboration opportunities, Notably NTNU yearly arctic trip in August. Met with John Ryan, Brett Hobson, Giancarlo Troni. (Week 7)
- Freaking out a bit. Helping my 87 year old mom understand the seriousness of the situation... (Week 12)
- Engineering zoom meeting. (Week 13)
- Learning LTSpice. (Week 17)
- Learning AWS Amazon (Week 17)
- Provided email to Kent on open source projects (Week 17)
- Comcast internet went down at my house - thanks to verizon for cell phone tethering. (Week 18)
- Comcast at new office is installing Thursday. (Week 18)
- Comcast internet has been down at my house for over a week (failed cable modem). Ordered a replacement - delayed. In hot water with the family (Week 19)
- Bunkhouse research institute has been setup and comcast is working there. No MBARI hours or money charged for setup of Bunkhouse. (Week 19)
- Meeting with Bridget, Chad, Gabe Santos to discuss Cal Poly pier project, working a transition plan after Gabe is done with school next winter quarter. Bridget will have CPE senior project students Winter/Spring. (Week 20)
- Abstracts (Week 21)
    - Planktivore project (Week 21)
    - Underwater Solar Harvesting Battery (Week 21)
    - Disruptive tech idea (Week 21)
- Bridget Benson has been working at the Bunkhouse office. She is wrapping next week. Great having her at MBARI, thanks Chad! Will collaborate starting next January on student projects at the Cal Poly pier. (Week 23)
- Proposals: Planktivore, Underwater Solar, Disruptive tech (Week 23)
- Prep and planning for intern TechFest. George approved hardware budget. Contacted Gabe Santos (intern from last year) and have enlisted him to help, would like to pay him. (Week 23)
- Abstract presentation for Underwater Solar Power system (Week 24)
- Abstract presentation for Next Generation Vehicle Initiative (Week 24)
- Abstract presentation for Planktivore (Week 24)
- Phone call with Dr. Tom Krupenkin to discuss reverse electrowetting on dielectric energy harvesting. Removed from work plan for Underwater Solar Power system (Week 24)
- David Lees NASA Telepresence seminar (Week 25)
- Working with Gabe and Tatjana to get Techfest board and parts ordering complete. (Week 26)
- Setup for techfest on the road. (Week 28)
- Thanks to help from Cindy, all techfest charges are coded (whew). (Week 28)
- Intern Techfest / Intern. Attending Intern symposium. Lessons learned with Gabe on remote techfest. (Week 33)
- Discussions with management over the Bunkhouse rental, etc. (Week 33)
- Working with Kent, Doug and Norm to get a labspace, a reasonable candidate (Week 34)
- Met with Gabe to talk lessons learned on Techfest. Gabe created a survey monkey to send to the interns. Gabe did a fantastic job running techfest this summer. (Week 34)
- Bridget Benson delivered healthy baby Margot on Aug. 5. We are in email contact on student projects this week. (Week 34)
- Fires have had an impact, did not go into MBARI as planned to drop off equipment. As of the 19th, Carmel (Cachagua) fire is 3 miles from our house. Smoke is a challenge. (Week 34)
- Moved most of the MBARI equipment to MBARI on Friday, evacuated with the remainder. (Week 35)
- Affected by Carmel and River Fires, evacuated and now returned. Much better now. (Week 35)

- Moving to new lab in building g, recovery from fire evac and rapid packing. Thanks to Josh for the help with airflow and Brett for making room. (Week 36)
- John Daly, Patrick Winston (Week 37)
- Zoom call with a EE student at Cabrillo College for class project (Week 40)
- Relocating home workspace from the dining room to a room vacated by my son who has returned to SLO. (Week 40)
- Met with Gabe Santos on the Pier Peer project for counting pinnipeds at the Cal Poly Pier. He has raspberry pi interfaced and streaming video through cell modem. He is working on tensorflow lite for identification. No EE student takers on the solar battery so Gabe is moving ahead with his own design. Also attended Gabe's Cal Poly techfest session. (Week 42)
- Gabe Santos (Cal Poly collaborator) has the Pier Peer rPi camera with tensorflow running and streaming live on youtube. His next step is sleepy pi, then packaging, then deploy at Cal Poly Pier. (Week 43)
- Was organizing for a trip to Cal Poly for deployment of Pier Peer camera system - this is now delayed by a week or more. (Week 46)
- I have wago stack at my home office and will be offloading some Xojo work from Rich Schramm (Week 49)
- Met with Rich Schramm regarding XOJO. Hunting for box with Wago stack, must have left it at MBARI as the house has been turned upside down. (Week 50)
- Organizing (Week 50)
- Met with Rich Schramm regarding XOJO. Hunting for box with Wago stack, must have left it at MBARI as the house has been turned upside down. (Week 51)
- Organizing (Week 51)
- Wago Stack box hunting. Many thanks for the management help. (Week 52)
- Home office inventory (Week 52)