Rob McEwen Sorted By Project

600034 - Precision Control Technologies for ROVs and AUVs

- Verified libtrnav for Dvl and Reson in the simulator for the Boulder Crossing mission at Portuguese Ledge. (Week 13)
- Still need to check Imagenex. (Week 13)
- Discussing next steps for Trn. (Week 32)
- Working with Rich to track down a problem with libtrnav where it won't converge over Portuguese Ledge with the Dvl or with a .grd format map. (Week 37)
- Ran simulations of the various scenarios above. (Week 37)
- (Week 37)
- Worked with Kent to solve a problem where Trn wasn't loading .grd maps. (Week 38)
- Reviewing simulator code in preparation for mbtrnpp inclusion. (Week 43)
- Reviewing Cooperative Navigation algorithm (Week 45)
- Reviewing Adam's Matlab code for cooperative navigation and simulation. (Week 48)
- TRN pull request reviews (Week 50)
- Working through Octree code (Week 50)
- Working through Rock's CN code (Week 50)

708167 - WEC Dynamics and Control

- Developed prototype code in Matab that detects wave crests from radar data using the Hough transform, an image processing technique. (Week 1)
- Can now estimate wavelengths of approaching waves. But this process is noisy and needs further adjusting and filtering. (Week 1)
- Testing this now on existing data. It looks promising. (Week 1)
- Will now use this data to estimate wave arrival times. (Week 1)
- Continuing to improve the wave crest identification algorithm and Matlab code. (Week 2)
- Estimating wave arrival time using distance-to-the-wave-crest, wavelength, and the dispersion relation. (Week 2)
- Integrating the Ahrs data. The objective is to compute the measured arrival time and check the above estimate. (Week 2)
- Investigating feasibility of Optical Flow algorithms to compute incoming wave speed. (Week 4)
- Obtained free 30-day trial of Matlab computer vision toolbox suite. (Week 4)
- Experimenting with the Computer Vision toolbox on a free trial. Will meet with a Matlab application engineer tomorrow for further advice on wave speed estimation. (Week 9)
- Implementing another technique to detect wave crests suggested by Mathworks applications engineer. (Week 10)
- Wrapped up wave-crest-location estimates using simple method. Sent results to the team. (Week 11)
- Cleaning up Matlab script in preparation for conversion to C/C++ code. (Week 13)
- Will clean up Matlab code and investigate conversion to C/C++ real-time. (Week 15)
- Merging my wave-crest location Matlab code with Umesh's sea-surface-elevation prediction Matlab code. (Week 16)
- Will clearly define inputs and will produce a plot showing the predicted elevation against that measured by the AHRS. (Week 16)
- Umesh will need to work on this after me to consolidate and configure his code. (Week 16)
- Converted the first wave-prediction function from Matlab to C code linked back into Matlab with their API. (Week 31)

- Verified that it produces the correct results. (Week 31)
- Sent a package of code and instructions to Umesh, so that he can prepare his wave-prediction Matlab algorithm for conversion to C/Matlab API. (Week 32)
- Will convert this to C and test in Matlab when he responds (Week 32)

901101 - Seafloor Mapping

- Helping Erik T. with simulation. (Week 45)

901405 - Powerbuoy

901405 - Wave-Energy Conversion for Oceanographic Applications

- Cleaning up Matlab code in preparation for port to real-time C code. (Week 14)
- Completed first pass at merging crest-detection and sea-surface prediction codes in Matlab. (Week 17)
- Tested on recorded data. Results are not yet adequate. (Week 17)
- Will work with team members to improve the algorithm. (Week 17)
- Reading papers in order to understand wave prediction algorithms. (Week 18)
- Working with Umesh to improve our joint wave prediction code. (Week 19)
- Starting to reformulate JHU Matlab code. (Week 30)
- Received code from Umesh. Will convert to C. (Week 33)
- Looking at WEC-Sim (Week 34)
- Working on converting Umesh's code to C. I changed my approach due to serious difficulty with the Matlab API. I am converting the code to stand-alone C that communicates with Matlab by reading and writing simple .csv files. (Week 38)
- Completed porting Umesh's code to C/C++. It communicates with Matlab through .csv files. (Week 42)
- The C version closely matches the Matlab version. (Week 42)
- Placed all the relevant files in ProjectLibrary/707976_EPBuoyPrototypeAndTesting/RadarPrediction (Week 42)
- Umesh's code is tested and archived on Project Library (see last week) (Week 43)

901513 - Targeted Sampling by AUVs

901902 - Aerial Drones

901902 - Unoccupied Aerial Vehicles for Science, Operations, and Outreach

- Discussing the proposal and how to restart this project. (Week 19)
- Taking 107 renewal course on the web. (Week 29)
- Working on 107 license renewal. (Week 30)
- Completed Part 107 License renewal. (Week 33)
- Completed Drone License part 107 renewal. (Week 34)
- Flew the airplane at the Monterey Bay Academy airstrip. First flight was ~30 minutes and was successful. We did a catapult (ballista) launch, then did automatic self-tuning PID maneuvers. I then landed it manually. We even got aerial photographs of test patterns. Second flight again was a catapult launch. The plane then flew a lawnmower pattern completely autonomously. Then we tested the "stability" mode (for pilot flying) which did not go well. (Week 45)
- Building next UAV, Believer #3. (Week 48)
- Working on Believer 3 build (Week 50)

902101 - LRAUV Technology Development and Fleet Operations

- Coming up to speed on the LR simulation. (Week 9)

- Will work with Rich H to replay the LR OA runs so that we can debug the OA code. (Week 9)
- Drag analysis of deep LR vehicle is still pending. (Week 9)
- Met with Rock and others regarding multivehicle LR operations. (Week 9)
- Attended Ben's sim meeting. (Week 9)
- Setting up the simulator, sanity checking the results. (Week 10)
- Will try to play back LCM data from OA dive to further test OA code. (Week 10)
- Looking at TRN run (Week 11)
- Working on lcm replay setup. (Week 12)
- Will use this to debug OA code by replaying February's Portuguese Ledge runs. (Week 12)
- Will also use this to assist Henthorn in debugging TRN on the LR. (Week 12)
- LCM replay now working with OA. Now able to plot and fix the code. (Week 13)
- Working with RH to get Trn Replay working with LR data. (Week 13)
- Used pre-existing Dorado simulation results to playback through LCM and verify that the LR version of the Obstacle Avoidance (OA) algorithm behaves correctly, at least in this one instance. (Week 14)
- Adding debugging output to the LR-OA. (Week 14)
- Added much more logging to the OA code. Testing and plotting it now. (Week 15)
- Pushed logging code onto the feature/config-file branch. (Week 16)
- Still need to add commanded depth as an input from the MVC through the LCM interface to OA. (Week 16)
- Examining Triton control problem (Week 25)
- Also will check power consumption of the new thruster servo. (Week 25)
- Updated Simulink buoyancy simulator. (Week 29)
- Assisting Brian K. in reducing buoyancy-control overshoot. (Week 29)
- Helping Brian K get ready for MI deployment. (Week 30)
- Assisted Brian with many buoyancy control tests in the tank. (Week 30)
- Buoyancy control has been improved, and has reduced overshoot. (Week 30)
- Upgraded Simulink buoyancy simulator (Week 30)
- Improved the Simulink buoyancy simulator. (Week 31)
- Developing a feedforward controller to further reduce the overshoot during the ballast-and-trim mission. (Week 31)
- The command generator fix removed the buoyancy-control overshoot for Daphne in the tank. But awaiting data from lake Erie to determine if further work is needed. That vehicle is larger and heavier. (Week 32)
- Developed candidate feed-forward control, and made a few more Simulink improvements. (Week 32)
- Will put this on hold until Makai/Brizo data is available (Week 32)
- Completed feedforward buoyancy control simulation. (Week 33)
- Looking into pitch oscillation problem on Trition. (Week 42)
- (Week 44)
- Evaluating effects of large fins on Tethys. Are they causing it to stall? (Week 45)
- Trying to track down why Trition's pendulum sonar rig doesn't point down during yoyos. (Week 48)
- Triton power analysis (Week 50)

Out of Office

- Probably Friday 29 Jan, and the following Monday through Wednesday.
- I will be taking approximately one vacation day per week through March. Exact dates TBD.
- Out of the office Thursday to get vaccination.
- Taking vacation day on Friday
- Taking one day of vacation per week for the next 6 weeks or so.
- Taking vacation on Friday
- Taking vacation today (Wed).
- Taking today and this coming Monday off as vacation.
- 26 Aug - 8 Sept
- 25 Aug - 8 Sept

- Nov22-24
- Dec 22-31

Overhead

- Annual Review (Week 4)
- Future of Dorado Software Meeting (Week 38)