

902405 - Precision Control Technologies

Week 51

1. Kent Headley
 - a. TRN CMakeLists update for libtrnav (see Seafloor mapping)

Week 47

1. Mike Risi
 - a. Tested midwater tracking algorithms, but the cruise was cut short due to weather conditions

Week 45

1. Kent Headley
 - a. With thanks to Carlos R, the TRN documentation initial release is now hosted on the MBARI doc site:
<https://docs.mbari.org/internal/trn-doc-md/index.html>
 - b. Thanks to Steve Rock and Rich Henthorn for their major contributions to the TRN documentation
2. Mike Risi
 - a. Tested software on the boat during the maintenance week
 - b. MOB for November 5th midwater tracking cruise

Week 43

1. Kent Headley
 - a. Continuing to test TRN reference application with Steve Rock, and updating documentation.
2. Mike Risi
 - a. Testing mid-water tracking controller changes for November 5th cruise

Week 42

1. Kent Headley
 - a. working with Steve Rock to test the trn-player utility (TRN reference implementation) and TRN documentation. I think we're nearing the end of feature completion, and Steve is running data sets and comparing output with the Replay tool that he's used in the past.

Week 41

1. Kent Headley
 - a. Made a number of updates to the TRN documentation; added an installer script for the reference application.
 - b. Gave Steve a copy of trn-player, a TRN reference application that can do TRN processing on log files and CSV data.
 - c. Generating relocatable MacOS binaries for Steve Rock to test turned out to be a bit of a rabbit hole. The issue had to do with the linkage of third-party libraries (netcdf), which are in different locations and have different versions on the build and target machines. In addition, the library ID in the netcdf shared lib is set to an absolute (build machine) path that contains a versioned library name. The path used is baked in to the libnetcdf build, which in turn is built by MacPorts. Even when building from source, it isn't exposed in a way I could find.
Came up with a solution using rpaths, but ultimately had to resort to post-build changing the netcdf LC_LOAD_DYLIB using install_name_tool, as I couldn't find a way to set/change it in cmake or in the netcdf build.
2. Rich Henthorn
 - a. Hello, TRN app
 - b. Carson day with LASS system intro to Ventana precision control ops
3. Mike Risi
 - a. Continuing work on mid-water tracking controller

Week 40

1. Rich Henthorn
 - a. Working on "Hello, TRN" application
2. Mike Risi
 - a. Working on mid-water tracking controller to dampen pitch oscillation

Week 39

1. Kent Headley
 - a. writing TRN example app for documentation
2. Rich Henthorn
 - a. "Hello. TRN" application

Week 37

1. Kent Headley
 - a. editing and reviewing draft release of TRN documentation w/ Steve Rock, Rich Henthorn

Week 36

1. Kent Headley

- a. Completed draft of TRN documentation, sent for initial review by Rock, Henthorn. Documentation uses mkdocs with the mkdocs-print-site-plugin extension (and others) to produce HTML and PDF output from markdown, with support for embedded LaTeX and Mermaid within markdown sources.

Mkdocs is easy to use, and requires less effort than Pandoc to generate really nice HTML documentation. The documentation systems I tried that use markdown all had some issues, particularly in rendering PDF, which is often down to the rendering under the hood. Renders based on weasyprint and wkthtml didn't seem to support LaTeX well; the mkdocs-print-site plugin, which uses playwright/headless chromium, had good support, and integrated smoothly with mkdoc and other markdown extensions.

Week 35

1. Kent Headley

- a. testing mkdocs and related plugins for generating HTML and PDF documentation
 - i. the winning combination seems to be mkdocs + mkdocs-exporter-plugin. Together, they do a nice job of rendering multipage HTML and generating a monolithic PDF output. With a couple of other plugins, mkdocs and exporter also support mermaid2 graphs embedded in markdown, as well as macros (for dynamically inserting special fields) and templates (for configuring section cover pages).
 - ii. did not have luck using plugins that rely on weasyprint for PDF rendering on macOS.

b. refactoring repo and TRN software guide

c. pulling together content from Rock and Henthorn

- d. If both PDF and HTML documentation are a requirement, maintaining the source in single format is efficient; it's a toss up as to whether markdown is ultimately a net positive over HTML/CSS as a native source format. Perhaps so for straightforward markdown (basic images and text). It can quickly get fiddly when extending markdown to have greater control over formatting, e.g. tables, columns, PDF page breaks, etc., or using special content e.g. (mermaid) graphs, equations, etc.

Many PDF rendering solutions require embedding non-standard content in markup, which can break compatibility with markdown tools, or including HTML in the markdown, which seems to defeat the purpose.

Markdown translation tools all seem to have tradeoffs in configurability.

OTOH, HTML to PDF rendering tools (pandoc, weasyprint, etc.) are also often unsatisfying - complex and sometimes lacking support for various types of content and (CSS) styling.

When both HTML and PDF documents are needed, it pays to keep formatting as

simple as possible, design HTML with translation to PDF in mind, and limit markdown use to smaller projects.

Week 28

1. Mike Risi
 - a. Working with Steve Rock mid-water tracking control loop testing

Week 26

1. Mike Risi
 - a. Working on testing midwater tracking control loop response to frequency sweep, still trying to eliminate the pitch oscillation

Week 22

1. Paul Roberts
 - a. May 27, testing 3rd order filter on CFE lab dive

Week 20

1. Kent Headley
 - a. At Mike Risi's suggestion, estimating potential amount of Steve Rock time we could potentially use on a contract basis for various efforts
2. Mike Risi
 - a. Working on implementation of filters to eliminate pitch oscillations during midwater tracking

Week 19

1. Mike Risi
 - a. Working Steve Rock to eliminate pitch oscillations on Ventana during midwater tracking

Week 16

1. Kent Headley
 - a. committed branch change set,
 - b. trying out mkdocs
 - c. reviewing Rich H LRAUV TRN doc (nice!)
2. Rich Henthorn
 - a. LRAUV TRN doc
3. Paul Roberts
 - a. April 15 deployment
 - b. Completed testing of existing tracking software, demo on radiolarians and sinkers

Week 15

1. Kent Headley
 - a. testing roV TRN updates
 - b. added feature to TRN plot utility
2. Rich Henthorn
 - a. TRN documentation
3. Mike Risi
 - a. Completed Ventana interface to midwater tracking control system
 - b. Testing midwater tracking software with Paul Roberts
 - c. Preparing for midwater tracking cruise next
 - d. More UI development for stereo KCF tracker
4. Paul Roberts
 - a. Prep for april 15 deployment

Week 14

1. Kent Headley
 - a. Refactoring TRN plugin for LASS DVL on Ventana. Rejiggered the nav corrections for vehicle and LASS DVL (on rotating arm); these are different, and the new versions should also inform how the corrections work across other plugins.
 - b. Refactored TRN geometry representation classes, adding base class accessor methods..
 - c. Wrote new TRN plugin for Norbit multibeam on miniROV
 - d. Data is flowing in new plugins, though still testing whether TRN is working; for Norbit and LASS DVL, there are issues with the inputs, e.g. limited view, low vehicle speed, etc.
May not be able to know without new data sets that address these issues.
 - e. Code review pull request
2. Rich Henthorn
 - a. LRAUV TRN (LRTRN) documentation
 - b. Alternative filters
3. Mike Risi
 - a. Testing RovLib Framework in lass-control development
 - b. Working on Ventana interface to midwater tracking control system
 - c. Starting development on new UI for stereo KCF tracker

Week 13

1. Kent Headley
 - a. Worked on running TRN using a scalable robotics data set (norbit multibeam on minirov)
 - b. Making progress, but still some anomalies; working to isolate code issues from data issues

- c. Setting up TRN configuration for LASS cruise (cancelled)
- 2. Rich Henthorn
 - a. Completed merge of TRN updates for LRAUV including closing the loop during navigation
 - b. Reviewing TRN documentation
- 3. Paul Roberts
 - a. Interface can upgrades
 - b. Code migration to tensorbook2

Week 12

- 1. Kent Headley
 - a. Added a lot of draft material for the TRN doc software section, revised structure, and circulated to Steve and Rich
- 2. Brian Kieft
 - a. Gazebo sim is broken. Will rely on Michael's hours for fix at this point
- 3. Paul Roberts
 - a. Interface can power supply upgrades

Week 11

- 1. Kent Headley
 - a. working on TRN software documentation
- 2. Rich Henthorn
 - a. LRAUV close-the-loop code merge
- 3. Mike Risi
 - a. Continuing RovLib development
 - b. Working on midwater tracking code for April cruise
- 4. Paul Roberts
 - a. Planning for April 15 deployment

Week 10

- 1. Kent Headley
 - a. Reviewed Steve Rock's (excellent) TRN documentation sections
 - b. Working on software documentation section
- 2. Brian Kieft
 - a. Attempting to get new sim run with single daemon for Steve. Currently the gz sim is broken (again) and this is a blocker for multiple tasks.
 - b. Confirmed nav ingest issue resolved for gz sim.
- 3. Paul Roberts
 - a. Updating chassis for new power supplies and network hardware

Week 9

- 1. Kent Headley

- a. Reviewing draft of Steve Rock's text on TRN for doc
- b. Working on doc software/integration section material

Week 7

- 1. Mike Risi
 - a. Working on Ventana interface for mwt-control code
 - b. Working on unit testing for RovLib framework
 - c. Fixed several bugs in the trajectory generator code
- 2. Paul Roberts
 - a. Purchasing hardware for universal AC/DC upgrades to interface housing

Week 6

- 1. Kent Headley
 - a. met with Steve last week re TRN doc and a pending code change
 - b. working on TRN doc organization

Week 5

- 1. Brian Kieft
 - a. Meeting with Steve to review december data
- 2. Mike Risi
 - a. Working on the RovLib framework
 - b. Working with Paul R. on mid-water tracking deployment plan for April

Week 4

- 1. Rich Henthorn
 - a. Merging updates
- 2. Brian Kieft
 - a. Did a non-ingest TRN run on Pontus per Steve's request

Week 3

- 1. Kent Headley
 - a. meeting w/ Steve re TRN doc, reviews
- 2. Rich Henthorn
 - a. Finishing touches on latest LRAUV TRN updates
- 3. Mike Risi
 - a. Meeting with Steve and Paul R. on mid-water tracking testing for April

Week 2

- 1. Rich Henthorn
 - a. Successful integration of TRN into LRAUV navigation system