

902304 - Piscivore Cam

Week 52

1. George Stern
 - a. Image testing data review

Week 51

1. George Stern
 - a. Purchasing and planning for next year

Week 50

1. Brent Roman
 - a. Dropped framerate to 30hz as an experiment for remainder of this deployment
2. George Stern
 - a. System planning for next year to optimize use of 2025 money

Week 49

1. Brent Roman
 - a. Configured G3 camera for another deployment
2. George Stern
 - a. End of year spending plans

Week 47

1. Brent Roman
 - a. Finally ran a YOLO object ID model on the CV25 camera.
 - i. Draws only 3W IDing full HD video at 16hz.
 - ii. Lots of work left to do
 - b. Set up purloined camera focusing rig in old pilot's area being remodeled
2. George Stern
 - a. Focus testing
 - b. ordered lens/holders
 - c. Last deployment video review of various exposure times and gain settings

Week 46

1. Brent Roman
 - a. Monitoring ongoing deployment.

- b. Wrote a script to sequence through alternative shutter speeds and auto exposure gains.
 - c. Contacted USB camera vendor recommended by Paul Roberts
- 2. George Stern
 - a. Looked through hundreds of additional lenses on aliexpress and autofocus solutions; identified a few additional possible lens candidates

Week 45

- 1. Brent Roman
 - a. Readied for another deployment
 - b. Evaluating effectiveness of video encoding parameters
 - c. Working with Olclea to determine how to use the CV25 chip for off-line transcoding
- 2. George Stern
 - a. Meeting and new camera review

Week 44

- 1. George Stern
 - a. Reviewed more footage and looked at some focus testing methods

Week 43

- 1. Brent Roman
 - a. Evaluating gen3 camera video from last week's deployment
 - i. Looks really good this time, much improved exposure range than gen2
- 2. George Stern
 - a. Looked at more gen3 footage to compare different camera settings

Week 42

- 1. Brent Roman
 - a. Modified max gain halfway through deployment to see its effect on low light video quality

Week 41

- 1. Brent Roman
 - a. Added a bunch of new command line switches to facilitate adjusting video parameters during deployments.
 - b. Switched to h.264 encoding because h.265 encoded video was jerky

Week 40

- 1. George Stern

- a. Ordered more parts for Gen3

Week 39

1. Brent Roman
 - a. Worked out an acceptable video file naming convention with Brian Schlining
 - b. Negotiated a punch list for next camera deployment.
 - c. Finally received converted ML model for testing on G3 camera
2. George Stern
 - a. Ordered parts for alternate bulkhead

Week 38

1. George Stern
 - a. Reviewed some gen3 canon video and extracted gen2 files for ai processing

Week 37

1. Brent Roman
 - a. 2nd deployment of 3rd Gen Piscivore
 - i. Increased record data rate from 4Mb/s to 13.24Mb/s
 - ii. Discovered that record rate is limited by SDcard write rate of 20Mb/s
 - iii. Reworked file naming convention per Lonnie's request

Week 36

1. George Stern
 - a. Reviewed some gen3 footage from Aug deployment
 - b. Fixed focus issue, rebuilt can and prep for canon deployment

Week 35

1. Brent Roman
 - a. Delaying start of backseat heartbeat seems to be required so that LRAUV shuts it down properly.

Week 34

1. George Stern
 - a. Final prep for deployment

Week 33

1. Brent Roman
 - a. Integration of packaged camera is going well.
 - i. Initial tests in tank working well
 - ii. Need to confirm that LRAUV restart sys will warn camera of shutdown

- iii. Need to create some LRAUV mission to switch camera off at night
- 2. George Stern
 - a. Final preparations and integration checks for the deployment

Week 32

- 1. George Stern
 - a. Continued integration on LRAUV and final can build a revised lens
 - b. New Lens/Camera comparison test with the gofish camera

Week 31

- 1. Brent Roman
 - a. Brought up 2nd article
 - b. Fixed issue causing failure after every few minutes of recording
 - c. Testing waterproof housing and cabling.
- 2. George Stern
 - a. Continued integrating the new camera
 - b. Began integrating new camera on LRAUV in prep for deployment in 1.5wks
 - c. Tested the new lens and discovered it needed a new holder to get close enough to focus
 - d. RTC is not working, debugging in progress

Week 30

- 1. George Stern
 - a. Identified a new lens
 - b. First housing is assembled and mostly working

Week 29

- 1. George Stern
 - a. Continued build and integration of the housing, completed checking out cards and fit checks
 - b. Built up a 2nd camera stack with spare kit parts
 - c. Began searching for a better lens for the current housing

Week 28

- 1. Brent Roman
 - a. Bringing up 2nd test article.
 - b. Worked out how to update device-tree without reflashing entire image
- 2. George Stern
 - a. GigE is now integrated and working
 - b. Updated cable drawing

Week 27

1. George Stern
 - a. Began integrating 1GbE interface

Week 26

1. Brent Roman
 - a. Seem to have fixed the timing deadline failures by turning off sync mode in the queue for monitoring video.
 - b. Working with Brian on a “backseat” software interface for Piscivore
2. George Stern
 - a. Meeting and continued work to integrate electrical and mechanical hardware for the Gen3 camera build
 - b. Finished initial comparative video between Gen2 and Gen3 cameras; there is a material improvement in low light capability, image quality and file sizes in the gen3 camera; FOV is smaller so a different lens may be needed

Week 25

1. George Stern
 - a. Comparative video testing of the new and old camera
 - b. Updated and reprinted the chassis to improve access to connectors and fill around inserts and screws
 - c. Continued to fit check hardware

Week 24

1. George Stern
 - a. Printed and began fit checking the chassis
 - b. Kitted boards for Etech build
 - c. Attempts to capture sundown to compare video noise/illumination between the next gen and gofish cameras hasn't gone to plan due to buggy cameras and a few software glitches

Week 23

1. George Stern
 - a. Revised mechanical design to increase clearances and add mounting bosses
 - b. Completed ordering everything
 - c. Started on harnessing schematics

Week 22

1. Brent Roman
 - a. Finally (sort of) wrapped my head around BitBake and Yocto.

- b. The prototype is recording HD video @60hz while serving a real-time RTSP stream.
 - c. Also corrects for camera lens warping and provides a WiFi link.
 - d. Worked with George Stern and Oclea to find a hardware fix for Battery Backed RTC.
- 2. George Stern
 - a. Completed schematic capture and layout
 - b. Began ordering parts

Week 21

- 1. George Stern
 - a. Began schematic capture and layout
 - b. Ordering hardware and refining mechanical design

Week 20

- 1. Brent Roman
 - a. Finally got the CV25 Ambarella based camera board image configured to my liking
 - i. With support for High-Speed WiFi, Wireguard VPN and SDcard storage
- 2. George Stern
 - a. Continued working on the can design for the next camera, mostly tried to identify ways to transfer heat from the board to the can without using air since that increase camera noise floor
 - i. Created one design with thermal straps but it requires machining copper which is a pain
 - ii. Created a 2nd design with heat pipes; but it is unclear how easy it will be to bend them, will see when they arrive.

Week 19

- 1. Denis Klimov
 - a. Assisted on a deployment of Piscivore on LRAUV from a Paragon.
- 2. Brent Roman
 - a. Oclea's CV25-based camera module is up and running
 - i. Built Yocto-based distro (after much trial and error)
 - ii. Reconfiguring Linux kernel for USB host instead of device
 - iii. Working with George Stern on packaging, physical ports, etc.
- 3. George Stern
 - a. Began working on a housing design
 - b. Began working on an electrical interface

Week 18

- 1. Brent Roman

- a. Configured Yocto to build images for Olcea hardware on my Desktop machine
- b. Demonstrated RTSP video server with the module we hope to deploy.

Week 16

1. Brent Roman
 - a. Worked with George Stern to write EOI requesting early access to their EVK/SDK for board development
 - b. Received and reviewed material.
 - c. Recommending we purchase ASAP
2. George Stern
 - a. Oclea granted access to additional documentation; after a much deeper review it looks even better and I am trying to buy a kit.

Week 15

1. George Stern
 - a. Oclea portal/documentation review; looks like it is worth buying a kit.

Week 14

1. Brent Roman
 - a. Sent EOI and got 2-week early access to their development portal for pre-purchase evaluation
2. George Stern
 - a. Identified coax cable and connector options for a GMSL3 test
 - b. Began ordering Framos parts for the test

Week 13

1. Brent Roman
 - a. Wrote LOI to Oclea to get a preview of their SDK before committing to purchase
2. George Stern
 - a. Identified framcos parts for GMSL3 test
 - b. Almost got NDA for GMSL3 but ADI now plans to publicly release datasheets in a month!

Week 12

1. Brent Roman
 - a. Working with Oclea to convince them to allow us access to their "portal" ahead of \$6k purchase
 - i. So MBARI can determine if their development kit suites our needs
2. George Stern
 - a. Met with Oclea again and discussed options to get access to their portal so we can evaluate the product without spending 6k on something which isn't ready

Week 11

1. Brent Roman
 - a. Design meetings
2. George Stern
 - a. Alternative architecture meetings

Week 10

1. George Stern
 - a. Meeting/research to discuss alternative system designs and continue pushing forward

Week 9

1. Brent Roman
 - a. Researched GStreamer viz a viz Ocelea.
2. George Stern
 - a. Researched Oclea Ambarella offerings and Technique/Resideo company
 - b. Looked for lenses

Week 8

1. George Stern
 - a. Driver and interface research for GMSL3/FPD-Link4; trying to scrape breadcrumbs because Analog and TI won't give me datasheets; probably just have to test it and hope for the best...
 - b. More image sensor and driver research

Week 7

1. Brent Roman
 - a. Researched more open alternative hardware architectures.
 - b. Advocated for higher power alternative architectures which also provide a much more open and well developed software ecosystem that would make it easier to establish optical requirements and iterate on optical parts
2. George Stern
 - a. Continued looking for rhonda/ambarella alternatives; evaluating some much higher power alternative architectures which also provide a much more open and well developed software ecosystem that would make it easier to establish optical requirements and iterate on optical parts

Week 6

1. Brent Roman

- a. Researching possibility of using commodity processor board and open source software
- 2. George Stern
 - a. More rhonda meetings - not going well... They don't want to provide total project cost estimates, technical analysis to support their platform choice, or really any information about the product; after sending them \$15k over 6wks ago and now having spent 4 meetings asking for details we requested in the spec we sent them >2mths ago, they finally read the spec and indicated they don't want to do much of what we asked... Hopefully the language barrier or possibly aggressive timeline is causing the issues?
 - b. Continued investigating alternative options - luxonis is so close but conversations with the company indicate either we would need a very complex hardware effort and software contract work they may not be interested in or it is probably over a year away; NVIDIA with GSML3/FPD-Link4 despite being technically risky due to lack of underwater connectors, and consuming too much power are looking better and better.

Week 4

- 1. George Stern
 - a. Held meeting with Rhonda SW, few concerns about current trajectory, they are working to answer some of our questions and remainder will wait until the project plan deliverable

Week 3

- 1. George Stern
 - a. First rhonda software meeting