Return to: 📄 README - PlanktoScope Software Task Force
All dates in this document are listed in the UTC time zone.
The recurring meeting link is meet.google.com/vyj-ouqv-vdg

2024-01-04

For this meeting and any future meetings in 2024, please go to
📄 2024-01 to 2024-06 Software Meetings instead!

2023-12-28

In attendance: Ethan, Satoshi

Individual updates + follow-up discussions

- Ethan: v2023.9.0 release imminent
    - E: planning to publish v2023.9.0 tomorrow or the day after
    - S: agree that we should just release now
- Community meetings?
    - E: Thibaut got too busy to attend these or to work on organizing the community workshop. In Nov/Dec we stopped having community meetings because FairScope USA meetings (Thibaut, Adam, and me, and sometimes Manu) started happening during the community meeting timeslot; but now those meetings are moved to time freed up by shortening these software meetings, so we can have community meetings again. Will need quorum of at least 3 people (including me and probably Adam) to bring back these community meetings.
    - S: will be busy in the first quarter until April, due to 2 cruises; each 1 month long. Maybe in second or third quarter of next year we can revive the community meetings.
    - E: unless someone else is able to join weekly, we'll probably not do community meetings in first quarter.
- S: I held some workshops this December. 7 or 8 people joined. We tested our PlanktoScopes. We'll have much more scheduled sampling - about 6 or 7 per year - around Japan. Using my v2.1-jp1 design which uses the Adafruit HAT. Need to fix some mechanical design issues, so will be making v2.1-jp2 soon. We might keep using DIY v2.1-derived designs in Japan at least for the next two years. So I hope you can continue maintaining software for v2.1 for the next one or two years.

- E: hopefully we can unify the pscopehat vs. adafruithat versions of the Node-RED dashboard. Afterwards, software support for hardware v2.1 won't be much of a maintenance burden in the future.
- S: Adafruit HATs are now harder to find directly in Japan. Otherwise we have to ship them from China/Japan, which takes a long time. So one person asked about using the Waveshare HAT instead, but I recommended just dealing with the long lead times for the Adafruit HAT.
- E: how about the custom planktoscope HATs?
- S: if FairScope sold planktoscope HATs as a standalone module, we would be very happy about that. That would help our situation.

Proposal review

Refer to [the Proposals project board on GitHub](#), and [our description of the proposals process](#).

(skipped because the meeting ran out of time)

Review of proposals in the Final Comments column:
- (none)

Review of proposals in the Under Review column:
- Laurent: [Proposal 290](#)

Review of proposals in the Submitted column:
- (none)

Next steps for proposals in the Draft column:
- Laurent: [Proposal 292](#)
- Ethan: [Proposal 307](#)
    - S: I (and everyone I know) just connects to the PlantoScope over Wi-Fi; we don't use Ethernet. None of my friends use Ethernet.
    - S: Option B (adding a USB Wi-Fi module to the kit) sounds nice, it would be nice for me. One of the good things about the Planktoscope is that we can take it anywhere, so Wi-Fi would be better than Ethernet for connecting to the internet - e.g. for running the PlanktoScopes outside.
    - S: Option C also sounds nice.
    - E: once people start trying out v2023.9.0's internet connection sharing, hopefully I'll get more feedback about what option might be best for most people.

TODO: post an update about our decisions from this meeting, to
https://github.com/PlanktoScope/PlanktoScope/issues/282

Any other discussions

2023-12-21

In attendance: Thibaut, Ethan, Shameera, Adam, Fabien

Individual updates + follow-up discussions

- Shameera: finished undergrad thesis! Shared the document with Thibaut. Tested a FairScope PlanktoScope and built another version with the Jetson Nano.
- Fabien: was quite busy with the workshop 2 weeks ago. 15 attendees, 5 returned home with PlanktoScopes. Will have a second session by Jan 15.
  - Processed lots of samples with PlanktoScope. Taught attendees on everything with setting up and operating PlanktoScopes and imaging the first sample and using EcoTaxa (1.5 days); then next 2 days were about repeating all that on a second sample; and then repeated all that on a third sample in 30 min. Purpose of all this was for training and inter-machine calibration. Went over metadata entry and consequences for results.
  - Discovered a bug: https://github.com/PlanktoScope/PlanktoScope/issues/316 . Vertical tow is not a viable workaround because it discards the entered filtered volume and recalculates based on start and end GPS if entered (but keeps it if no end position entered).
  - Discussion of https://planktoscope.slack.com/archives/C01V5ENKG0M/p1703173659153749
    - (Slide 2) Bug with filtered volume being lost. Lots of metadata errors, mostly with operator data entry. Hard to rectify errors because of https://github.com/PlanktoScope/PlanktoScope/issues/315
    - (Slide 3) When operators forget to run the bubbler, the absolute concentrations look totally different.
- Ethan: v2023.9.0 release timeline
  - Fabien: it's been hectic, so I haven't had a chance to test it yet.
  - Thibaut: haven't had time to test it either
  - Ethan: may need to recommend pscopehat users to use v2.3 until we figure out timeout problems
  - Fabien: when there are lots of PlanktoScopes in the same room, and lots of people connecting, then things slow down, lose connections, etc. With 15 PlanktoScopes and operators, wifi connections degrade in reliability and

performance - making them unusable. We had to spread out people, and some PlanktoScopes seemed to be more sensitive than others.
- Fabien: if we don't see timeout errors on software v2023.9.0, it could be something for us to run on the Jan 15 workshop.

Proposal review

Refer to the Proposals project board on GitHub, and our description of the proposals process.

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- Laurent: Proposal 290

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Next steps for proposals in the Draft column:
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- Ethan: Proposal 307

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Any other discussions

2023-12-07

In attendance: Wassim, Ethan

Individual updates + follow-up discussions

- Ethan: v2023.9.0-beta.2 prerelease; v2023.9.0 release plans
- Wassim:
    - FairScope today won a third-place competition prize at my school - a contest between startups who presented their ideas to a jury. I was present with Thibaut

this morning. Thibaut plans to use the prize money to expand the offices in Morlaix, to make space for interns in the future.
- Updates in the last two weeks:
    - Was focused on understanding more and making the getter/setter methods for picamera parameters (e.g. ISO, shutter speed, etc.). Was trying to figure out how to modify those parameters; made methods for almost all params expect ISO, shutter speed, and resolution. These three params aren't directly managed by picamera2; we need to adjust other params which affect these params. Also, we can't modify camera resolution once it's started. So we need to fix a resolution in the configuration before starting the camera. To capture high-res images, I found the resolution on the picamera2 repo which allows us to capture high-res images despite getting low-res preview stream images.
    - Need to figure out why picamera2 stream isn't showing up on the dashboard. Discussed with Thibaut last week, proposed to isolate each thread (imager thread, stepper thread, light thread) once and test to see if there's an issue in the interaction with the other threads. This problem exists only with picamera2.

Proposal review

Refer to [the Proposals project board on GitHub](#), and [our description of the proposals process](#).

Review of proposals in the Final Comments column:
- (none)

Review of proposals in the Under Review column:
- Laurent: [Proposal 290](#)
    - (no change this week)

Review of proposals in the Submitted column:
- (none)

Next steps for proposals in the Draft column:
- Laurent: [Proposal 292](#)
    - (no change this week)
- Ethan: [Proposal 307](#)
    - (no change this week)

TODO: post an update about our decisions from this meeting, to
https://github.com/PlanktoScope/PlanktoScope/issues/282

Any other discussions

2023-11-30

In attendance: Thibaut, Adam, Ethan, Laurent

Individual updates + follow-up discussions

- Laurent
    - Proposals (see next section)
    - PR device-backend#14
    - Offboarding/feedback on experience of contributing to the project
        - Would like to continue contributing to the project in the future
        - Various things to be defined about the development process - felt like I was crash-testing those things and learning while you were still defining those things.
        - The three documents on the Google Drive folder for defining those processes need to be updated, including with our last discussions from last week's meeting, about the proposal processes, and branch naming vs. issue numbers.
        - Thibaut: at some point, you need a computer connected to the PlanktoScope to test things; but also the PlanktoScope needs to connect to the internet to download stuff, and the dev computer also needs an internet connection. This process is a bit hard to establish correctly in a way that makes sense.
        - Ethan TODO: add documentation for this to the project docs
        - Laurent: The internet connection sharing had some issues. It worked for me, but once you enter a new wifi and you lost the PlanktoScope's wifi, you have this problem that if it's not working (either with Ethernet cable)...for me, connecting from the PlanktoScope to my local wifi didn't work. It works with Ethernet cable, but yesterday it didn't. Once it doesn't work, then you're trapped: you can't reload the PlanktoScope's wifi, and you're blocked. You must reflash the SD card.
        - E: might be useful to include a wifi dongle with the RPi, and/or to provide an Ethernet-to-USB adapter as part of the kit. Need to ensure it has driver support on the OS, and it doesn't stick out of the PlanktoScope too much

- E TODO: in developer guide, emphasize using Ethernet cable for one of the PlanktoScope connections
- T: 🟧 PlanktoScope - Tutorial
- T: what about phone USB tethering?
- E: not sure; may need OS configuration. Easier to use phone as mobile hotspot.
- T: need to make sure we can deal with captive portals from university wifi networks
- E: need to make it easy for users to connect planktoscope to the network
- L: need to clarify and simplify network issues.
- E TODO: write up a proposal about improving the ease of connecting the planktoscope to the network.
- T: for users with existing planktoscopes, it could be tricky to ask users to have the same wifi dongle. Proposal needs to account for sourcing/availability, and users of "legacy PlanktoScopes"
- A: I like the idea of using the cellphone tethering, because it works right away.
- T: what I like about USB tethering is…if phone has internet and is passing that through wifi hotspot, both the computer and the planktoscope can connect to the phone wifi hotspot.
- E: complexities, e.g. with lack of mDNS support. Ethernet cable is most reliable
- A: for developers, Ethernet cable is fine. For normal users, it's too much to ask. Though if we give the adapter and a short Ethernet cable in the kit, then it's fine and not a problem at all.
- T: I prefer USB tethering from a personal device if possible.
- E TODO: try out USB tethering and include in the design document.
- Wassim
    - T: he visited the factory last week, is considering moving closer to the factory
    - T: he's taking exams soon. Full-time on project starting in Jan
- Ethan
    - Proposals (see next section)
    - Progress blocker: PR 273 is ready to merge, pending acceptance of proposal 291.
    - Progress blocker: Inclusion of v2.5 hardware BOM in the docs? Need confirmation from Thibaut. Refer to https://planktoscope.slack.com/archives/C01V24TUQ13/p1701298725449299?thread_ts=1701279133.744669&cid=C01V24TUQ13
        - T: go ahead. People can feel free to try it and report issues.

- T: would be nice to have it not on GitHub, but in a place that people can provide links for parts in their specific countries.
- E: I'd like to keep it on GitHub, but call out in the docs that we want users to upload country-specific BOMs they made.
- E TODO: upload this BOM, update the docs to ask for country-specific BOM uploads.
- Update: [PR 295](#) reduced SD card image size by ~50 MB (and to prevent it from growing out-of-control in the future as we add hardware setup docs+images for future hardware versions), now the default offline docs site on the PlanktoScope omits the hardware setup guides.
- We had already decided that users probably don't need hardware setup docs on the PlanktoScope's offline copy of the docs.
- It's possible to restore the full docs site by enabling a feature flag in Forklift.
- Minor update: [PR 294](#) updated some PlanktoScope operation docs to account for changes made for software v2023.9.0.

Proposal Review

Refer to [the Proposals project board on GitHub](#), and [our description of the proposals process](#).

Review of proposals in the Final Comments column:
- (none)

Review of proposals in the Under Review column:
- Ethan: [Proposal 291](#)
  - T: I've been testing it on the Raspberry Pi 4 and it was working successfully with no problems. I think it's a success.
  - L: no other feedback. I think we should accept the proposal
  - E TODO: make git tag on the install script for v2023.9.0-beta.2
- Decision: move the proposal to Accepted

Review of proposals in the Submitted column:
- Laurent: [Proposal 290](#)
  - E: needs more discussion
  - L: we'll need you (Ethan) to take over the design document. For me, I think we should benefit the presence of the UI/UX intern by resolving this issue and finishing thinking about what we want to do with the metadata organization. Think about new features in future versions of the PlanktoScope software.

- T: I agree that EcoTaxa requirements sometimes don't make sense, and we should just figure out what works for us and then translate the terms later for different interfaces.
- T: we'll need to spend some time to discuss each metadata field, confirm each one for implementation. It'll be time-consuming, but it's an important process.
- T: the intern is starting at beginning of february. So ideally we would resolve the metadata organization in Dec/Jan so that things are clean before the intern starts.
- Decision: move the proposal to Under Review

Next steps for proposals in the Draft column:
- Laurent: [Proposal 292](#)
    - L: I still have some changes to make to the design document.
    - L: yesterday I tried new things and didn't document them. I have to add comments on this issue to document everything we tried, so that future people know everything we attempted.
    - L: I found that the 0x64 I2C address was for the LED driver rather than the EEPROM. I'll talk about these things in GitHub Issues comments. EEPROM is turning out to be way more complicated than expected. EEPROM didn't show up in i2cdetect. The RPi's internal EEPROM also doesn't show up in i2cdetect.
- Decision: keep the proposal in the Draft column

TODO: post an update about our decisions from this meeting, to
https://github.com/PlanktoScope/PlanktoScope/issues/282

Any other discussions

- A: Raspberry Pi 5
- T: you've been invited to a planktoscope-bot channel on Slack - a LangChain GPT something connected to a chat bot on Slack, to answer user questions based on the documentation. The team will stop working on this project in 20 days. So if it's not useful, we'll archive the channel.
    - E: maybe have them push code to an experiment repo in our github repo
    - T: we have a call next week in Friday in your timezone.

2023-11-22

In attendance: Thibaut, Adam, Laurent, Ethan
(Thibaut and Adam both had to drop out early in the meeting, so this meeting was mainly a discussion between Laurent and Ethan)

Individual updates + follow-up discussions

- Laurent
    - EEPROM updates
        - I made a Python script on the RPi with the filebrowser app to run it from the Cockpit terminal. Initially tried to make a branch and work in the software/eepromutils directory, but won't do that because multiple problems are blocking me right now.
        - The I2C address of the EEPROM on the HAT is 0x64. The RPi also has its own EEPROM at 0x50. The EEPROM at 0x64 is not empty: it has some data inside. I couldn't interpret it.
        - Right now we're trying to modify hardware info which is hardcoded in the EEPROM, and to modify it based on what's in the GUI about the version of the PlanktoScope hardware being sued. Thibaut wanted to automatically (at machine boot) retrieve info from the EEPROM about the machine's hardware config, which will be used as metadata by the backend and frontend. That's mainly all the info I added to the hardware.json file in my proposal: RPi version, amount of RAM, HAT version, LED version, pump version, focusing motors version. Trying to retrieve them from the system of the Raspberry Pi and store them somewhere (e.g. the EEPROM or in a file)
        - Right now I'm not retrieving that information from the EEPROM because I don't know how to decode the EEPROM.
        - I have been able to retrieve the info about the RPi, but that's not querying the HAT or the EEPROM. I was trying to write to the EEPROM of the HAT and read it back. This worked. If that worked, I'd continue trying to retrieve all the info about all the devices connected to the HAT. I was able to write info to the EEPROM but I couldn't decode the info I was writing.
        - There appears to be some kind of character encoding problem
        - Right now our documentation about the PlanktoScope HAT is about the manufacturing of the PCB, the BOM; but we have no info about the way the HAT is using the EEPROM
        - (troubleshooting session)
        - https://github.com/PlanktoScope/PlanktoScope/blob/master/hardware/v2.5/hat/Planktoscope-Hat-Schematic.pdf
        - https://www.st.com/resource/en/datasheet/m24c32-w.pdf
        - E: conclusion: even writing and reading back a list of bytes isn't working
        - E TODO: go through the datasheet and look for any relevant issue, add notes to the comment for the future proposal for EEPROM
    - Questions about the EEPROM chip?
    - New proposal (see next section)

- Wassim: no updates from me, still working on displaying the camera preview on the ps dashboard
- Ethan
    - Proposals process: github.com/PlanktoScope/proposals
    - Request for Thibaut: please make both projects in https://github.com/orgs/PlanktoScope/projects public
    - New proposal (see next section)

Proposal Review

Refer to the Proposals project board on GitHub, and our description of the proposals process.

Review of proposals in the Final Comments column:
- (none)

Review of proposals in the Under Review column:
- (none)

Review of proposals in the Submitted column:
- Ethan: Proposal 291
    - Decision: moved to Under Review, and we'll revisit this next week to see if we can move it into Accept

Next steps for proposals in the Draft column:
- Laurent: Proposal 290
    - L: besides compatibility discussion, I'm done with the initial draft of the design document
    - E: assigned myself as PR reviewer
    - E TODO: discuss compatibility in a reply to Proposal 290.
    - Decision: moved to Submitted
- Laurent: will make a new proposal for use of the HAT's EEPROM

FairScope-specific strategy discussions?

Possible topics:
- What role to hire for the third intern
- Cloud data platform(s)/service(s) integration (we already discussed some software-related aspects of this in the 2023-11-23 community meeting, oops) - implications for FairScope business operational costs, product strategy, etc.?

2023-11-16

In attendance: Thibaut, Ethan, Adam, Wassim, Laurent

Individual updates + follow-up discussions

- Laurent:
  - Working on metadata, had lots of questions.
  - Started a new document: 📄 PlanktoScope Software Guideline
  - Proposal: persist all Node-RED settings in a settings file, but some things should not be stored in the config.json file.
  - Identified some things that need to be improved in Node-RED
  - T: goal is to organize metadata into a way that makes sense. The current metadata compilation sheet is meant to designate a place where each metadata field should be stored. config.json should have all settings necessary for data acquisition, for easy replication across people
  - E: big changes are being proposed, with implications for backwards-compatibility (both software and hardware). Need a design document.
  - T: my goal for Laurent is to look at metadata stuff and then transition to persisting some settings on the EEPROM.
  - L: it might be worth breaking backwards-compatibility here. Compatibility is an important factor, but we need to make improvements.
  - E: yes, we just need to explain our rationale for these kinds of changes
  - L: Maybe we can start to think about a new tab on Node-RED - for now the hardware tab is hidden at the end with a "please don't touch this"; maybe we need to simply have a cleaner message and better documentation for the user, and have a better user interface related to hardware settings.
  - E TODO: set up a place on the Software Google Drive folder for proposals/design documents related to big changes in the software
- Wassim:
  - Pushed work into a new branch on the device-backend repo: feature/picamera2-module
  - Changes are in device-backend/control/pscopehat/imagernew
  - Imager process and picamera class are still a work-in-progress.
  - Question: The path to get streaming frames for the camera is a long path; I didn't locate the source for that path in the system. The Python process serves on port 8000/stream.mjpg

- E: I have a reverse-proxy on port 80 which serves everything currently on other ports on the RPi, so that Node-RED can reliably instruct the web browser where to find the MJPEG stream
- E: https://github.com/PlanktoScope/device-pkgs/blob/edge/core/apps/planktoscope/device-backend/controller/compose-camera-preview-stream-mjpeg.yml
- Ethan
  - https://github.com/PlanktoScope/PlanktoScope/pull/274
  - I've been using marktext to edit documentation on my computer
  - What documentation is needed for hardware bring-up testing? What does FairScope do for this?
    - T: v2.5 vs. v2.6 differences. I looked into how to write documentation with MarkDown. Dav is new to all of that. We started by making Google Slides, so now we have a structure. We know the pictures to show, etc.
    - T: here's the assembly guide for v2.6.2: 🟧 Assembly Guide - V.2.6.2
    - T: I also wanted to have a user guide, with pictures of how to do different steps
    - T: I looked at how other companies do step-by-step guides. They use Dozuki, which is too expensive. There's also https://dokit.io/
    - T: it'd be nice to have a user interface, be able to upload an image, place a circle somewhere, without using GitHub or Markdown. But maybe we'll have to do that.
    - E: maybe you can make initial docs on Google Doc, freeze changes, then I transfer it to GitHub, and then you make changes on the Git repository.
    - T: we haven't released v2.6 as open-source, so we don't yet have a BoM or PCB stuff - they're not online yet. I wonder if that makes sense to publish all at once when we're moving from hardware v2.6 to hardware v2.7.
    - E: users who've bought the v2.6 DIY kit will need assembly instruction
  - E: future work from Thibaut will be needed on https://github.com/PlanktoScope/PlanktoScope/blob/hotfix/docs-organization/documentation/docs/reference/hardware/changelog.md , after I merge my pull request (note: this link will stop working once I merge my pull request)
  - T: what about the protocols.io documentation? Protocol is hard to edit. I'm also working on a usage guide, to have pictures of 2.6 and info about maintenance, operation, etc.
  - E: I'd like to get operation stuff into our docs site
- Thibaut
  - I accepted someone for the internship to work on the GUI. I can pass you the resume.

- I've been using VSCode for editing documentation. But there's no easy way in Markdown or Git by themselves to combine photos and annotations (circles, text labels, etc.) into images for the documentation
- E: maybe there's a tool which can do that?
- T: https://wikifab.org/wiki/Accueil has a step-by-step organization and a way to generate such images
- E TODO: I'll look into whether we can find something open-source to integrate into our workflow

(FairScope-specific strategy discussions?)

(maybe skip this if Adam is not in attendance)

Long-term discussions?

- Improving computer & network security of the software (refer to this section)
- Including an Ethernet-to-USB adaptor + Ethernet cable with FairScope PlanktoScopes/kits, to facilitate troubleshooting?
- Enabling the PlanktoScope to simultaneously make a Wi-Fi hotspot and connect to a Wi-Fi network (refer to this section)

2023-11-09

In attendance: Thibaut, Laurent, Ethan, Fabien, Wassim, Adam, Satoshi

Individual updates + follow-up discussions

- Fabien:
    - Pierre Kostyrka will be serving >1 year and deploying PlanktoScope. Will be teaching Dakar community how to use PlanktoScope (in contact with labs there) to duplicate our Villefranche imaging platform in Dakar. FlowCam, UVP, PlanktoScope.
    - Training to use instruments, use data, with good practices. Will release first 10 PlanktoScopes by first week of December (Dec 4 - 8): 18 people training together to use PlanktoScope. Onboarding to machine, sample processing, machine calibration & cross-calibration. Will be very busy that week. The training is related to a project associated with TREC.
- Laurent:
    - Work on metadata: no updates. Still working on a way of presenting the different modifications I suggest doing. Will modify ⊞ Metadata Compilation .

As it is now, variables in config.json can be all modified by interface; it doesn't contain any hardware specs; I want to keep it that way. hardware.json: getting variables from PlanktoScope HAT to retrieve hardware constants; in case of modifying the PlanktoScope and modifying peripherals, will need some time to see what can be retrieved and what's already a problem.

- Possible topic for community meeting? Need to figure out what hardware variables should be modifiable by the user. 2 main goals: be able to modify the hardware variables, even those we can't retrieve automatically in case of modified PlanktoScopes; and keep information steady and accurate, for usability and scientific reproducibility.
    - F: as a user, whatever is hardware setting or or acquisition setting that should be filled automatically; if there is hardware setting which needs to be filled automatically, and it's dangerous for users to modify them. The only settings which users should change are sample information. Hardware settings (pixel size, pump step rate, etc.) need to be calibrated by users who might forget to report calibration and might want to change it afterwards. Except those settings, everything else could be dangerous to datasets if users can change them.
    - E: there should be a way for advanced users to change anything needed; could be as simple as just directly editing files. Or could be an "advanced users" interface, or a separate webpage.
    - F: need to help users keep high-integrity metadata. e.g. it's not easy for users to edit TSV metadata files. Such things should be available as emergency solutions, but not something to use for people who follow the standard protocol.
    - T: for some hardware settings, ideally everything is fixed and constant. But there may be some variability in optics (e.g. different magnifications). This is something fixed for FairScope version for now, but might change over time. Satoshi is playing with magnification and flowcell size. These things shouldn't be changed frequently, but should be changeable by users.
    - F: whatever users can change in software for experimentation, users could forget to change afterwards.
    - S: maybe we could have a "Danger Zone" for advanced settings.
    - E: regarding forgetting to change settings back: in the arctic, sometimes we forgot to change other things like Station ID. Maybe we need a confirmation dialog for all settings before imaging?
    - L: how is UX managed?

- F: managed at different levels. Some people prefer to write everything on a Word document and send it to people who can implement stuff. That's me.
- F: some people prefer to make lots of issues on GitHub and leave them there forever in the hopes that someone will pick them up. Romain was good at that.
- F: in the middle, Ethan reacts when I send stuff on Slack or GitHub and makes issues and follows up.
- F: most people send me emails and discuss problems with me.
- F: so it's currently a bit messy
- T: there is no form where people can go and create tickets. At the current size of the community, we can still do things ourselves.
- T: I will try to get someone to work on the GUI for 6 months starting in January. Starting by collecting everyone's opinions on what should be done, and the specs, before jumping into details
- Ethan: no updates from me outside of my updates on community meeting-related topics (too many other things going on the past week to make progress on v2023.9.0 release)
- Satoshi:
    - Update on our progress in Japan. I gave a presentation and just submitted an application to build an initiative community to monitor microplankton with PlanktoScope around Japan by 8 scientists. If accepted, it'll start next January. Will continue working on applications to make community to monitor plankton around Japan.
    - Tomorrow I'm going to Hokkaido to visit Daichi Arima, who is a PlanktoScope superuser in Japan ([Slack Intro from Daichi](#)) - tested his PlanktoScope during spring bloom to summer bloom around Hokkaido, got good images with v2.1 PlanktoScope hardware. Will discuss our current progress, next steps.
    - Will demo my PlanktoScope to people during a domestic congress of Japanese scientists.
    - ICHA Meeting is happening - Yoichi Miyake gave a presentation of the PlanktoScope there.
    - T: I received a poster from Savannah who is presenting there. They took a traditional sailboat in the Pacific.
- Wassim: not many updates. Made a [repo](#) for my initial picamera2 experiments. Tomorrow I'll work on picamera2 class for the PlanktoScope codebase, which I started drafting last week. Will test on PlanktoScope

Follow-ups from/discussions for PlanktoScope community meeting

Go to: 📄 2023-06 to 2023-12 Community Meetings (2023-11-08 meeting agenda)

Long-term discussions

- Improving computer & network security of the software (refer to [this section](#))
- Including an Ethernet-to-USB adaptor + Ethernet cable with FairScope PlanktoScopes/kits, to facilitate troubleshooting?
- Enabling the PlanktoScope to simultaneously make a Wi-Fi hotspot and connect to a Wi-Fi network (refer to [this section](#))

2023-11-02

In attendance: Laurent Vallet, Ethan Li, Wassim Chakroun

Introductions

- Laurent:
    - L: I'm a friend of Thibaut; software engineer. Had the opportunity to work on FairScope for November.
    - L: T explained some of the things he wanted me to work on. Especially documenting the metadata, and storing some metadata in the hardware EEPROM module on the planktoscope hat, and exporting as much of our metadata as possible to EcoTaxa.
    - L: plan to update something with the [metadata documentation spreadsheet](#)
    - L: after November, will just be a part of the community, and will contribute to the project in my free time

Follow-ups from PlanktoScope community meeting

Refer to: [notes from 2023-11-01 community meeting](#)
- Thibaut: the plan for Laurent's work
    - Next meeting: discuss plan in enough detail to make GitHub issues
        - E: (discussion of relevant files, and how to inspect the metadata)
- Thibaut: how to work together on GitHub?
    - Ethan: (discussion of current processes)
    - W: after modifying backend files, how to test modifications on planktoscope and commit changes in Git?
        - E: because the SD card setup scripts download a specific version of the device-backend repository (which is often older than the latest version on

GitHub), will need to `rm -rf /home/pi/device-backend`, set up git on the RPi with your user account information, SSH key, etc., and then `cd /home/pi; git clone [git@github.com](git@github.com):PlanktoScope/device-backend.git`. Then make commits locally and push to github.

Individual updates + follow-up discussions

- Wassim:
    - W: last week, I looked at the files which manage the camera - raspimjpeg, imager process, etc. And looked at the interfaces of the functions, etc., to see what needs to be changed for the newer library
    - W: this week, I worked on the streamer so that it could be compatible with picamera. The actual streamer works with raspimjpeg - video files are saved to a temporary file specific to raspimjpeg. Need to update things to work with picamera2. Updated streamer, tested it on a separate page, to see if updated streamer works. It worked well on a separate HTML page. Now looking to integrate the newer version of the streamer, and draft a class for picamera to integrate with picamera2 library. Will test on PlanktoScope soon
    - E: make a copy of the imager folder, and call it e.g. imagernew; rename "imager" to "imagernew" in pscopehat/main.py. Make edits only in imagernew
- Ethan:
    - v2023.9.0-beta.2 prerelease: progress updates
        - Restructuring of docs site
- Thibaut :
    - What is the error, how can we solve this ? timeout during capture / WAS NOT CAPTURED! STOPPING THE PROCESS!
        - E: this issue has been reported by multiple people. Hard to reproduce, because it seems to occur non-deterministically - it goes away with one or two reboots, and returns under identical conditions. Might also manifest as an unresponsive camera when adjusting camera settings. Seems to occur more frequently than in v2.3 software. Don't know the cause. This might actually be a blocker for the software release, since basically everyone's seen this problem 🙁 - in this case, I'll need to spend more time to try to reproduce the problem
        - FL: this is important to investigate since this is definitively a blocker on my side. I wonder if this does not comes from an increased delay of response of the soft/camera. Potential cause: the soft is not ready when the camera respond (therefore thinking that the camera is not responding while it actually already did
    - Is it possible that the current beta OS is slower than before ?

- E: boot is very slow for the first boot of a fresh SD card; I fixed this for v2023.9.0-beta.2. More work will be needed to make boot faster in general.
        - E: have you experienced the software being slower outside of boot?
        - -FL: yes reboot time seems to be larger before the wifi appears, seems to me that navigation between node red pages gets slightly slower. Maybe that increased latence is causing the timeout error

Long-term discussions

- Improving computer & network security of the software (refer to [this section](#))
- Including an Ethernet-to-USB adaptor + Ethernet cable with FairScope PlanktoScopes/kits, to facilitate troubleshooting?
- Enabling the PlanktoScope to simultaneously make a Wi-Fi hotspot and connect to a Wi-Fi network (refer to [this section](#))
- Inter-machine calibration
    - FL: I'm working on this. Technically have the solution for WB intercalibration. What makes a difference was the variety of hardware design that we had when doing the intercalibration (led/lens/camera with-without IR filters etc). Size calibration is not an issue. Did already some counts / acquisition intercalibrations (but mostly shows that the user errors could make a difference)
- Software platform values to guide decision-making (see the "Our technology's values as a platform" section of 📄 Software Strategy) - anything to move into core values & secondary values? Anything to reorder? What's missing from the list?

2023-10-26

In attendance: Ethan, Thibaut, Adam, Satoshi

Individual updates + follow-up discussions

- Satoshi:
    - Presented at PICES on Tuesday, already had some nice response to PlanktoScope. Here for ~30 minutes.
- Thibaut :
    - **Hot topic n°1 = over exposition**. The problem is seen by many users due to the removal of the IR filter on the Pi Camera HQ. Annoying since we lose quality and information during the acquisition. It could probably be fixed via the software but we don't know yet how (Reduce the light intensity by controlling the LED better via its driver or by reducing the brightness or another parameter in the

raspimjpeg.conf). For now we are playing with some filter in order to see the positive effect of such hardware trick : Filter comparison - We are working on the Light.py

- T: I have 20 units ready to leave, unsure whether to add some kind of tape on the LED in order to reduce the light intensity, or send them like the previous batch with this problem of overexposure. This is the problem where the workaround has been to add a few layers of tape to the illumination LED.
- T: I was thinking of standardizing what tape we use, in order to add the same tape to all units. That brought me to some consideration to avoid. I made a new folder in our Google Drive folder called Intercalibration, and a Google Slides document called "Filter comparison". Exploring new questions which can be addressed with this. What is a good reference vs. what is not?
- T: apparently it's easy to change LED intensity by changing one value in the Python code for the light - so we can tune the light intensity and define a value which doesn't necessarily overexpose our sample.
- E: How is LED intensity controlled?
- T: the pscopehat schematic has an LED driver
- E: from looking at part docs for LM36011, this looks like a current driver - so intensity control.
- T: would be nice to have a patch for the next release to control the LED intensity to prevent the overexposure. raspimjpeg still saves brighter images than preview regardless though.
- E: look at raspimjpeg.conf to make ISO setting match?
- E: TODO: also fix the incorrect image size setting…
  - (update: https://github.com/PlanktoScope/PlanktoScope/issues/258)
- T: image sizes in raspimjpeg.conf don't match the actual sizes. It sets ISO to 0 for default value. It sets brightness to 50 - adjusting that just reduces the brightness but doesn't change overexposure behavior.
- T: exposure isn't fixed even though we define it as 125 - when a giant copepod passes by, the shutter speed seems to change then.
- E: sounds as if some AEC is still happening.
- T: my friend is trying out the LED intensity adjustment as a software workaround
- E: probably better to have a hardware workaround for this software bug, and then we can undo the workaround later.
- T: would be good to try reducing the LED intensity as a software workaround, to avoid the need for a hardware workaround.

- E: TODO: update a github issue to track this problematic behavior
  - (update: https://github.com/PlanktoScope/PlanktoScope/issues/259)
- T: (update) the LED intensity change is done!

Release-related discussions

- Restructuring planktoscope.org links & pages to account for existence of multiple hardware versions (esp. v2.1 & v2.5)
  - Proposal 1 from last meeting: change the "Documentation" item in the navbar to a menu with v2.1 & v2.5 items (linking to the old readthedocs site for v2.1 vs. the updated docs site for v2.5)
  - Proposal 2 from last meeting: reorganize the "Get your kit" and "Assemble your kit" pages to have a section for v2.1 and a separate section for v2.5 (which maybe is just a list of links into the updated docs site?)
  - Proposal 3: migrating the v2.1 hardware docs into our new docs site
  - T: I like the possibility of having you all interact with the current site, which is a Google website. I can give editing permissions to all of you. That could be a way to implement these proposals.
  - T: since the v2.1 "Get your kit" and "assemble your kit" pages already exist, we can have the v2.1 pages still accessible from the menu. Though also it'd be nice to get rid of our current website and have a new website
  - T: (shared website editing permissions with Ethan and Satoshi)
  - E: TODO: update the website
    - (update: https://github.com/PlanktoScope/PlanktoScope/issues/260)
  - T: regarding migrating to a new website system: I like the idea of having a website where the community can create content and publish content more. The current site is pretty static. Maybe move towards something more like a blog or a community website, where the content comes more from the community.
  - E: should probably just use wordpress for familiarity. TODO: add a long-term discussion item for that
    - (update: https://github.com/PlanktoScope/PlanktoScope/issues/262)
  - T: planktoscope.wordpress.com is my sandbox now. I can't figure out how to get custom domains for that yet.
  - T: TODO: I'll make all of you admins on the wordpress site sandbox. Feel free to try making changes on it. My registered domain names are planktoscope.blog and planktoscope.community
    - (update: done)
  - E: I can try to get the custom domain name linked for planktoscope.community

- T: TODO: I can try to get you access, since it's now Squarespace domain name management
    - (update: done)
- T: would be good to migrate our static content to the wordpress site
- E: TODO: use planktoscope.community for our docs sites (e.g. docs.planktoscope.community) instead of docs.fairscope.com
    - (update: https://github.com/PlanktoScope/PlanktoScope/issues/144)
- Any improvements to the docs site for v2023.9.0?
    - Ethan: I'd like to simplify the top-level nav, e.g. by consolidating the Contribute, Community, and License sections into a "Community" section.
        - T: sounds good
    - Do we need to include v2.6 hardware docs in the PlanktoScope docs site?
        - T: for now, v2.5 is online and we're showing a lot of information about it. v2.6 is commercialized and not yet open-source. The idea is to release v2.6 once v2.7 is ready to be commercialized. This way we'd keep some progression and exclusivity to paying customers. Not sure if this is okay with open-source. Also, does this work for you? Also, would we actually be presenting something new for the version? I can also see the development of new variants, rather than necessarily a linear evolution.
        - E: this needs a separate discussion because there are many ways to do this.
        - T: maybe we can do another call on these kinds of topics, e.g. every tuesday for 1 hour
        - (all agree about this)
            - S: this would be difficult for me in Japan
            - T: or maybe Wednesday - that would work better for me
            - E: maybe a hybrid format where we have a 1-week comment period after proposals/ideas, before any decisions are made
            - T: maybe we can record these meetings, since the discussion topics will go beyond software
            - T: so on wednesday we discuss a few important topics we have in mind, record, publish on youtube channel linked to the PlanktoScope community (rather than FairScope)
            - T: TODO: I'll make the meeting calendar event
                - (update: done)
            - E: another option would be to have this meeting be nighttime in pacific time
            - S: what do you plan to discuss at these meetings? Do you want to decide how the FairScope goals should be, or ?

- T: the idea of this other meeting is to discuss non-software topics - e.g. community, project, work for people to do. During these software calls, we're often discussing non-software topics too. It could be nice to invite the whole community to interact with these discussions and decisions, instead of us just deciding for everyone with no community input. Even just a 50-minute video with proposals to vote on.
  - S: not sure it works well for the community, but it would be nice
  - E: let's just try it out and see what happens
  - T: will do a call next wednesday
  - E: TODO: start a meeting agenda document
- Ethan: We could just have separate sections under the Hardware top-level section for v2.5 vs. v2.6 vs. v2.6.1, etc. Each section could have a mechanical fabrication page , an electronics fab+assembly page, a mechanical integration/assembly page, etc.
  - T: I like that
- Ethan: this would also provide a pathway to migrate the lower-quality v2.1 docs into our new docs site, so that motivated community members who are stuck on v2.1 can improve the documentation.
- v2.6 hardware support for v2023.9.0 software? v2.6 hardware configs (are they different from v2.5 hardware configs)?
  - T: the hardware version has a different name, and the optics are now different - now it's a 25+12 coupled optics. So magnification and pixel size have changed.
  - Ethan: what is the difference between v2.5 and v2.6?
    - T: pixel size for v2.6 should be 0.88, not 0.75. For v2.6, the fnumber objective should be changed from 16 to 12
    - T: also, the direction of the focus is now flipped. This is not "stepper_reverse". This is the result of a PCB mistake.
    - E: will add a TODO: add some hardware.json setting for flipping the focus stepper direction. This will be for after v2023.9.0
      - (update: https://github.com/PlanktoScope/PlanktoScope/issues/265)
    - E TODO: make a new v2.6 hardware.json file
      - (update: https://github.com/PlanktoScope/PlanktoScope/issues/264)
  - T: in the acquisition tab in Node-RED, there is a toggle to change the direction of the pump.
- Is the v2.6 custom Node-RED dashboard stored on GitHub somewhere? Are we planning to discard it starting with v2023.9.0, due to its divergence from the Node-RED dashboard at https://github.com/PlanktoScope/PlanktoScope ?

- T: I have no real dashboard, it's basically the same.
- T: I had been doing some testing on Node-RED, but didn't make any permanent changes. You can just focus on what's on github.com/PlanktoScope/PlanktoScope.
- T: question about the name of the wifi SSID - is it possible to have a shorter name, e.g. without the number?
  - E: word lists are at https://github.com/PlanktoScope/machine-name/tree/main/pkg/wordlists/en_US.UTF-8. Number is needed to ensure uniqueness. Most users can ignore the number, but it does need to exist at the technical number
  - E: we can make longer word lists in the future
  - A: the formlabs printers just use two words
- Making docs available at docs-edge.fairscope.com, docs-beta.fairscope.com, docs.fairscope.com
  - E: TODO: use docs.planktoscope.community, etc.
    - (update: https://github.com/PlanktoScope/PlanktoScope/issues/144 is now updated)
- Will tag v2023.9.0-beta.2 prerelease after the new docs and after the v2.6 hardware.json file
- Ethan: After v2023.9.0, I'm planning to change the second part of the version number from an indicator of the month to just a "minor" increment. So if we have 4 releases in 2024, they'll be v2024.0.0, v2024.1.0, v2024.2.0, and v2024.3.0, regardless of which month each release is actually published. This will be less stressful for me, especially because it's hard for us to do any timeline planning around community beta testing, and because I learned in the v2023.9.0 release cycle that bugfixes in Node-RED are too difficult to pull back or isolate from any other changes in Node-RED.
- T: when you do a segmentation, at the end you get a table. Inside it is metadata related to github page which is wrong for process_source and process_commit. These need to be updated. This is annoying.
  - E: TODO: fix this
    - (update: https://github.com/PlanktoScope/PlanktoScope/issues/266)
- T: in the current documentation, there's a v2.3 annotated in the navbar, presumably related to v2.3 of the software. People are unclear if that refers to v2.3 of the hardware. Maybe the names of the releases could be human names, e.g. "Sunray"
  - S: the current situation is currently confusing for newcomers. Need for a description of the change in our version numbering situation.
  - E: TODO: mention that we're starting to make a distinction between hardware version and software version, with our upcoming software release
    - (update: incorporated into the planned release notes for v2023.9.0)
  - S: mention it on the website, maybe

- E: TODO: plan to follow up on this in future meetings
- E: TODO: see if we can do something about the "latest release" version tag in the docs site's navbar

(Thibaut had to leave here.)

Other time-sensitive discussions

- What will be our meeting cadence for November?
- Annual PlanktoScope workshop: when will we do the first planning meeting?
- Other follow-up calls
  - Long-term discussions: who to account for in scheduling those calls? Who else (if anyone) should the calls be open to?

Long-term discussions

- What is FairScope's mission? What is the value of FairScope? What activities should FairScope focus on? Product innovation work, manufacturing, other kinds of activities?
- How will FairScope help customers? What will be FairScope's business strategy & software product strategy (refer to this comment)? What will be the FairScope company's principles & values?
- FairScope hiring: what should be the next position we hire internally in FairScope?
- Software platform values to guide decision-making (see the "Our technology's values as a platform" section of 📄 Software Strategy) - anything to move into core values & secondary values? Anything to reorder? What's missing from the list? (wait until Satoshi can join a meeting before discussing this)
- Inter-machine calibration
- Improving computer & network security of the software (refer to this section)

2023-10-19

In attendance: Pierre Kostyrka, Satoshi Kitajima, Thibaut Pollina, Ethan Li, Wassim Chakroun, Adam Larson

Introductions

- Pierre: will work with Fabien on deployment of 10 (+14 more eventually + Deployment of 40 PlanktoScope in Europe) PlanktoScopes in France. Just started! Here to listen.

Individual updates + follow-up discussions

- Recap of past few meetings:
    - Fabien isn't available to attend a PlanktoScope community workshop in first week of December (will be running a 1-week PlanktoScope training workshop)
    - In 2023-09-21 meeting, Satoshi & Ethan did some brainstorming about considerations for planning the PlanktoScope community workshop, and ideas for Slack workspace structure/governance
- Thibaut
    - **Wassim's missions**
        - T: 6-month part-time + 6-month full-time
        - W: first 6 months: image acquisition process - replacing raspimjpeg with picamera2.
        - W: started doing background research on this.
        - W: last 6 months: maybe work on image classification & segmentation. Detecting specific types of objects, e.g. recruitment of larvae.
        - T: counting & staging larvae, since they're quite big (unlike HABs). Can use larvae to get preliminary training set.
    - **Interns recruitments** - there is a need to decompose the software dev into **work packages** that could be distributed to students and enable collab around a single WP across different groups in different labs
        - T: discussing with some Univ. Sarajevo students in Bosnia - they're interested in working on project. Also students at engineering school in Brest - a few internships, e.g. on software and/or hardware
        - T: Various issues to address, e.g. automatic focusing
        - E: also automatic white balance
        - T: automation of user tasks would be very helpful
        - T: also GUI ergonomics
        - T: maybe half of a GUI internship could be focused on gathering specific needs from users, and getting to well-defined specifications
        - T: will need to figure things out before end of October
    - Presentation of the **Ocean Hackathon** which aims to explore Data visualization possibilities
        - T: 10 people are interested in this project. 3 from an AI-focused company. Discussed with Manu, Fabien, others in Villefranche. Some part of the challenge may be useless; data visualization may be very useful - either generated live during segmentation or after-the-fact post-segmentation. e.g. t-SNE.
    - **planktoscope.blog** and **planktoscope.community** are two domains FairScope took in order to host a website for the community which could also be on

planktoscope.org depending on the discussion currently happening with Plankton Planet
- T: was excited after discussion with Manu, wanted to start blogging. Bought a WordPress blog/site. Had issues synchronizing domains from Squarespace to Wordpress. This can be a temporary substitute while there's discussion with Plankton Planet.
- Planning calls related specifically to **long-term discussions** + one to one calls about **Forklift Paper**
  - E: added meeting agenda item to figure out follow-up calls
- Description of "**Projet Commande Entreprise**" currently on going
  - T: Students working with a company to help with their mission. Proposed a project to make a chatbot for new users to ask questions. Exploratory project. The students took a ChatGPT API and had some links implemented into the prompt. We can make a channel in the Slack for these students.
  - E: need for improvements to documentation - will also probably be needed for this project
- Wassim
  - W: started looking at picamera2 documentation. No issues with that. Started testing it with a basic RPi system. Got some images. Succeeded in reducing some background color issues.
    - E: how testing picamera2?
    - W: running some Python scripts outside the PlanktoScope software project.
  - Raspimjpeg usage in the system (how is it called/launched? how are parameter changes transferred from the dashboard to the camera config?)
    - W: tried to figure out how it's being used. Found the config file for raspimjpeg. But how are we using raspimjpeg?
    - E: (described overall architecture)
    - TODO for E: send links for docs & code to W
  - T: where are the different Python files now?
    - E: at https://github.com/PlanktoScope/device-backend now
- Ethan
  - (of relevance to Thibaut) Started drafting Forklift paper: 📄 2023 Forklift Paper . Would appreciate feedback from Thibaut on the "Case Study: The PlanktoScope Project" section, especially/specifically on whether there are any factual/interpretive inaccuracies.
  - Was focused on paper-writing (forklift), slides (forklift + ten-earth), poster-making (ten-earth), and forklift design+implementation over the past few weeks
    - TODO for T: look over the draft, add any comments as needed

Release-related discussions

- Any outstanding issues for our [v2023.9.0 milestone](#)?
    - [#244](#)
        - Ethan: Minor problem. Will fix this for v2023.9.0-beta.2
    - [#249](#)
        - Ethan: this is also part of [#212](#). Hopefully fixed by [#238](#), but will need to test in v2023.9.0-beta.2
        - E: after #238, if a user types a value for WB and waits, nothing will happen until they click away
        - T: if/when we prototype something in Node-RED locally, how do we get that onto GitHub.
        - E: (description of how we have the adafruit Node-RED dashboard vs. the pscopehat Node-RED dashboard; divergence due to different approaches to controlling the illumination LED and the fan HAT; need for merging into a single Node-RED dashboard)
    - [#212](#) issues with flaky responsiveness of raspimjpeg
        - Ethan: unclear what has caused this - it appears to be worse now than in software v2.3
        - Is this a blocker to the v2023.9.0 release?
        - T: have been using v2023.9.0-beta.1 a lot, didn't play with camera settings because all the default values looked fine. Just advise users to re-flash SD card with a brand new thing and not touch camera settings.
        - T: this is related to the calibration - why would you want to change ISO, shutter speed, WB, etc.
        - T: there is situation of camera overexposing due to raspimjpeg's brokenness. Current workaround is to add tape to the illumination LED. Other option is to adjust raspimjpeg config file's brightness.
        - T: would prefer to focus on moving away from raspimjpeg.
        - T: we already have major improvements, and the remainder is as buggy as before. I didn't have any blocking problems in the current version of the software
        - E: ok, we can just hold #212 out of the v2023.9.0 release, but we can do a v2023.9.1 patch release if it's a major problem and we figure out how to fix it.
    - [#245](#)
        - Ethan: what is the status of the additional three PlanktoScopes ordered by the Prakash Lab? I still don't have consistent access to any v2.6 PlanktoScope for testing/troubleshooting GPS
            - T: two others will leave the factory next week.
            - S: what's the difference between v2.6 and v2.6.1 hardware?

- - - T: difference in the flowcell holder - v2.6 just uses a ziptie, while v2.6.1 uses three layers to hold the syringe.
    - - T: have ordered five Raspberry Pi 5's, they should arrive by end of this month. Will test to see what changes (if any) are needed. Some customers preordered PlanktoScope with RPi 5's.
  - T: I didn't test the GPS time stuff
  - T: might not be sustainable to try to use more of the GPS HAT's capability. The GPS recorded by the machine doesn't correspond to the location used for sampling - it's basically useless for GPS location.
  - T: GPS time is nice-to-have, but the main priority is just having accurate time. Could be fine to remove GPS HAT?
  - E: RTC would remove the need for a GPS HAT to set system time. Could provide instructions (either from us or from the community) to add an RTC module.
  - Is this a blocker to the v2023.9.0 release?
    - - T: if we fix #245, then we can use the GPS HAT. So this is valuable.
    - - T: but this is not present in all the hardware, so it'll only benefit people using v2.1, which was just a proof-of-concept anyways
    - - T: might not be a great use of time.
    - - E decision: if this is the last thing holding up v2023.9.0 release, maybe we'll just release it without fixing #245.
- (reported by Satoshi) issues with the planktoscope documentation, including website addresses?
  - S: in website of planktoscope, there are two documents for manufacturing: v2.5 vs. v2.1. Both links are placed in different sites. We need to rearrange links to v2.5, or we can choose v2.1 vs. v2.5. Not sure what's the best approach, wanted to discuss that. Current situation isn't user-friendly.
  - S: on the planktoscope.org website, the "Get Your Kit" and "Assemble Your Kit" links go to the old readthedocs site for v2.1. But the Documentation link in the website header goes to the new github.io site for v2.5
  - (thibaut ran out of battery here and had to leave the call)
  - S: one option would be to copy the v2.1 assembly instructions into the new docs site. There are some people who are stuck on v2.1 (due to availability of parts), they would benefit from having maintained instructions for v2.1 hardware.
  - E: someone will need to volunteer to do this. May be easier to do after we figure out how to structure the docs site to accommodate multiple

hardware versions, which we'll need to do anyways for differences between v2.5 and v2.6, and for future hardware versions
- S: maybe for now the navbar on planktoscope.org can have a menu under Documentation - one for v2.1 and one for v2.5? And then we can update the site links to account for the existence of multiple hardware versions.
- v2.6 hardware support? v2.6 hardware configs?
- Is the v2.6 custom Node-RED dashboard stored on GitHub somewhere? Are we planning to discard it starting with v2023.9.0, given its divergence from the Node-RED dashboard on GitHub?
- Making docs available at docs-edge.fairscope.com, docs-beta.fairscope.com, docs.fairscope.com
- Any new testing feedback?
    - E: it sounded like T didn't encounter any problems
- What are our next steps?

Other time-sensitive discussions

- When is our next meeting? What will be our meeting cadence for the next few weeks?
    - Satoshi: can't attend next week's meeting (will be in Seattle for PICES)
- Other follow-up calls
- Annual PlanktoScope workshop: when will we do the first planning meeting?
    - TODO for E: follow up on Slack to figure out meeting time

Long-term discussions

- What is FairScope's mission? What is the value of FairScope? What activities should FairScope focus on? Product innovation work, manufacturing, other kinds of activities?
- How will FairScope help customers? What will be FairScope's business strategy & software product strategy (refer to this comment)? What will be the FairScope company's principles & values?
- FairScope hiring: what should be the next position we hire internally in FairScope?
- Software platform values to guide decision-making (see the "Our technology's values as a platform" section of 📄 Software Strategy) - anything to move into core values & secondary values? Anything to reorder? What's missing from the list? (wait until Satoshi can join a meeting before discussing this)
- Inter-machine calibration
- Improving computer & network security of the software (refer to this section)

2023-10-12

(Ethan will have to attend a small conference on this day and thus won't be able to attend this meeting)

2023-10-05

(this meeting did not happen because only Ethan showed up)

Release-related discussions

-   Any new testing feedback?

Other time-sensitive discussions

-   Annual PlanktoScope workshop: when will we do the first planning meeting?

Long-term discussions

-   FairScope mission: What is the value of FairScope? What activities should FairScope focus on? Product innovation work, manufacturing, other kinds of activities?
-   FairScope business strategy & software product strategy (refer to this comment) and the FairScope company's mission, principles & values
-   FairScope hiring: what should be the next position we hire internally in FairScope?
-   Software platform values to guide decision-making (see the "Our technology's values as a platform" section of 📄 Software Strategy) - anything to move into core values & secondary values? Anything to reorder? What's missing from the list? (wait until Satoshi can join a meeting before discussing this)
-   Inter-machine calibration
-   Improving computer & network security of the software (refer to this section)

2023-09-28

Since Thibaut will not be attending this meeting, Ethan will hold "office hours" to discuss any topics relevant to meeting attendees.

In attendance at ~20 minutes after the planned start of the meeting: Ethan, Fabien

"Office hours" + general discussion

- Fabien: a few students will be running the PlanktoScope and other things for one year with the French Navy
- PlanktoScope community workshop
    - Fabien: will definitely be quite busy in the first week of the December. Starting to think of doing full week of formation of the ten PlanktoScope units to deploy in France. 10 scientists invited to Villefranche following courses about PlanktoScope. Will be a 1 week thing: get participants up and running with PlanktoScopes, have them run at least 3 samples. Part of a broader European project to deploy 50 units. First 10 units in France, the rest in other European countries. One week is needed to get deep confidence in using the machine.
    - Fabien: it's only once you run your third or fourth sample that you can do so without mistakes. Run samples with supervision and make mistakes several times first!

2023-09-21

Since Thibaut will not be attending this meeting, Ethan will hold "office hours" to discuss any topics relevant to meeting attendees.

In attendance: Satoshi, Ethan

"Office hours" + general discussion

- Satoshi: training workshop; setting up a monitoring network; want an IFCB-like dashboard for EcoTaxa
- Ethan: ten-earth; forklift paper
- Planktoscope community workshop: casual brainstorming/discussion
    - Timezones for attendees around the world…split it up into a few hangouts across 24 hours?
    - Satoshi: important to discuss the progress of community over the past 2 years. v2.5, v2.6, software, ongoing & upcoming changes. How are projects of end-users going so far? What will happen in the next year or two?
    - Satoshi: we must show how community members are using PlanktoScope, and the good points and limitations of the PlanktoScope for end users. What are our dreams for the PlanktoScope for end-users?
    - Ethan: discuss the fate of v2.1; what do users want regarding that?
    - Satoshi: v2.1-jp1, v2.1-jp2 hardware
    - Ethan: users sharing their custom modifications to planktoscope

- Ethan: user input to guide project decision-making?
- Satoshi: decision-making processes for a community project?
- Ethan: going global as a community/project: how to structure the community to encourage people to start communities in their own languages/cultures?
- Ethan: loved the casual format today. Maybe turn one of the software meetings into a community meeting, once a month?
    - Satoshi: we must include more than the software - e.g. hardware, end-user. Talk about identification of images. That's one of the weaknesses of our community - we can't discuss further the species identified, some people get nervous about identification; we can't help them in the current Slack channels - we don't have channels for that. In yesterday's workshop, some people pointed out the lack of any channel to discuss identification
    - Satoshi: once we publish the v2023.9.0 software, we can start using the software meeting time for other topics occasionally
- Slack workspace channel structure & governance
    - Ethan: community workshop: get user feedback about slack channel structure, and decision-making about governance of the channel structure?
    - Satoshi: maybe need some new slack channels or some new meetings to help users trying to assemble their planktoscopes? We can discuss that in the December community workshop.
    - Ethan: we have many Slack channels, and many of them aren't really used. Potential for consolidation?
    - Ethan: need to add topics & descriptions to channels
    - Satoshi: need to discuss with Thibaut about this, and whether we can add more channels by ourselves or we must discuss in our community to get decisions made about channels, etc.
    - Ethan: polls/proposal-based decision-making?
- Next week's meeting?
    - Ethan: Thibaut probably will still be gone. Let's do another casual community hangout/chat!

2023-09-14

In attendance: Wassim, Ethan, Thibaut, Adam, Shameera

Introductions

- Wassim: student at IMT Atlantique, engineering student (data science specialization). Internship in deep learning (satellite data, identifying lakes). Apprenticing with FairScope

- Shameera: student in Cape Town. Final-year thesis: adapting PlanktoScope for custom use

Release-related discussions

- How do we feel about our beta testing period, now that we've had 2 weeks of testing?
    - Ethan: (more bugs than I wanted from beta)
    - Thibaut: didn't get a chance to test anything on beta yet
- Are we on schedule to move into late beta soon after this meeting?
    - Ethan: tagged v2023.9.0-beta.1 last night, will generate SD card images. Need more test reports from more people.
    - Thibaut: have SD card, will leave for more testing. Will do a test report at the end of the two weeks. Leaving tomorrow.
    - Ethan TODO: get new the beta.1 SD card image out before Thibaut leaves.
    - Test plan for Thibaut: networking stuff, naming, Node-RED dashboard, everything
    - Ethan: we can just ask everyone to submit their bug reports to the #6-dev-software channel on slack
    - Thibaut: maybe Adam and I can intensely test, then you can fix identified bugs, before the public beta. Release sometime in October?
    - Ethan: ok - v2023.9.0-beta.2 will be a public beta then. Will push back release date to October or later.
- Would the #0-general channel be the best place to make the announcement?
    - Sure, but that'll be in a few weeks anyways.
    - Thibaut: not sure if we want to do @channel to ping everyone.
    - Ethan: Discord servers usually have an announcements channel.
    - Thibaut: let's just ping everyone on the general channel.
- What changes do we want to make to our plan for the next release cycle (tentatively planned as v2023.12.0)?
    - Ethan: (1.5-month beta testing? 2 month beta testing? 3 vs. 4 vs. 6 month release cycle)
    - Thibaut: good to have lots of simple releases, smaller changes. Also shows to the community that things are moving, software is evolving.
    - Ethan: community capacity to do beta testing quickly? -> 3 vs. 4 month release cycle.

Other time-sensitive discussions

- When will we choose a time for weekly work calls with Thibaut, Ethan, and Wassim on Thursday CEST?
    - Thibaut: the current setup works for me

- Wassim: fully flexible on the last two days of each week for work
        - Shameera: this also works. Internship ends Oct 30 (6 weeks from now)
- Ethan: next meeting: testing discussion + Ethan "office hours".
- Annual PlanktoScope workshop: which month will we target for our next workshop? What will be our next steps, and who will do each task?
    - Thibaut: let's target this for December. Start of October: have another call, for 2 hours; 30 minutes for distributing roles & tasks; then software discussions & individual progress updates the rest of the time.
    - Thibaut: or we could do a 1-hour software meeting and a proper 1-hour planning meeting for the workshop.
    - Ethan: could be fine to do a separate workshop planning meeting right before/after the software meeting. Or we could turn our weekly software meetings into weekly community meetings.
    - Thibaut: people from our community would also be happy to help make this workshop happen

Any other discussions

- Thibaut: bug-reporting app on Slack, might be useful:
  https://planktoscope.slack.com/apps/A01ELPEUL5V-bug-reporting?tab=more_info
    - Ethan TODO: see what this app does
- Thibaut: 2 weeks of sailing + testing on the new version of the PlanktoScope hardware & software, going to/returning from a marine instrumentation conference. Going to Japan at start of November for a conference, New Orleans in February for another conference. Will be testing some plankton nets. Also simplifying the manufacturing process.
- Thibaut: subcontracting design of the custom PlanktoScope HAT in October. Will need input from this team on the HAT design.
- Thibaut: looking into finances for hiring more people to help.
- Shameera: working on setting up the NVIDIA Jetson Nano with the PlanktoScope's pi camera. Had to change the pump system due to local component sourcing.

New items to save for future meetings

2023-09-07

(this meeting did not happen, because Ethan was the only person who attended)

Release-related discussions

- How do we feel about our beta testing period, now that we've had 1 week of testing?
    - Ethan: I made too many changes in the final two weeks of the alpha period, leading to more bugs than I had expected. The quality of our v2023.9.0-beta.0 release is closer to an alpha release, in terms of the number of bugs I caused.
    - Ethan: the beta testing bug reports from Fabien and Ana on Slack have been absolutely essential for discovering new bugs, and for uncovering existing problems in the software. I feel great about the direction of our PlanktoScope community!
    - Ethan: adding Cockpit and the system file browser has made my life much easier for troubleshooting problems reported by other users, especially when the bugs are complicated enough that I can't reproduce them easily. I'm glad I added those software programs to our SD card image.
    - Ethan: I'm confident that the next release cycle will go more smoothly, with all the lessons I've learned from going through this release cycle so far. e.g. I've started assembling [release checklists](#) for going from alpha to beta, and I will make a release checklist for going from beta to stable.
- Are we on schedule for transitioning from early beta (i.e. a beta pre-release only announced to the #6-dev-software channel on Slack) to late beta (i.e. a beta pre-release announced to everyone) after next week's meeting?
    - Ethan: potential delayer is [#210](#) because the Node-RED logic for determining camera type is not fully straightforward. However, it might actually be as easy as adding some missing fields in some config files.
    - Ethan: potential showstoppers are [#199](#) & [#212](#) because we don't yet have enough information from testers to understand the cause of the reported problems.
- Once we transition to late beta, would the #0-general channel be the best place to make the announcement?
- What changes do we want to make to our plan for the next release cycle (tentatively planned as v2023.12.0)?
    - Ethan: One month of beta (2 weeks for early beta + 2 weeks for late beta) is not enough time for testing and bugfixes, relative to the amount of changes I ended up making in the Node-RED dashboard with this past release.
    - Ethan: here's my proposal for a better timeline for our next release, working backwards from the final release date:
        - Have an internal goal to release v2023.12.0 no later than Dec 21 UTC (the third Thursday of December). If we need more time to fix bugs, we can still release v2023.12.0 in early January of 2024 - we won't make any promises about the release date before we actually publish the release.

- Reserve 3 weeks for "late beta" (announced to everyone in the community), starting Nov 30.
- Reserve 3 weeks for "early beta" (announced to everyone in the #6-dev-software channel) starting Nov 9 (the second Thursday of November).
- Ethan: another option (can be combined with the 1.5-month beta testing period) is to reduce our release frequency from 4 releases per year to 3 releases per year, giving 4 months between each release; then we would change the v2023.12.0 release to a v2024.1.0 release. This would allow more time for the "alpha testing" period to help stabilize the software before beta. Either way, I want to have smaller releases (i.e. fewer changes per release), so that I cause fewer unexpected bugs in beta testing. A 1.5-month beta period with a 3-month release cycle would force me to make smaller releases, while a 4-month release cycle could allow us to have even a 2-month beta period (1 month for early beta, 1 month for late beta), and we could even publish the stable release near the middle of the final month if we don't need all of the allocated time to discover/fix bugs.

Other time-sensitive discussions

If Thibaut is able to attend:
- When will we choose a time for weekly work calls with Thibaut, Ethan, and Wassim on Thursday CEST?
- Annual PlanktoScope workshop: which month will we target for our next workshop? What will be our next steps, and who will do each task?

New items to save for future meetings

- Need to decide between moving the Adafruit HAT version of the Node-RED dashboard to maintenance mode, vs. merging the Adafruit HAT and pscope HAT versions back together into a single Node-RED dashboard. What questions, if any, do we need to answer (e.g. about the amount of work needed to merge together the two versions, or to add new features if we don't merge them; and about the impact on people using PlanktoScope v2.1) before we can make an informed decision?
- What is the future of the Node-RED dashboard? How do we feel about replacing it entirely, piece by piece?
- Add a control panel to allow advanced users to change the PlanktoScope's static IP addresses (192.168.4.1 and 192.168.5.1) to other IP addresses? See issue 201 for the motivation for this proposal.

2023-08-31

We will try to keep this meeting short and focused only on preparing for our v2023.9.0 beta feature freeze + beta testing period with the v2023.9.0-beta.0 prerelease.

In attendance: Ethan, Fabien, Satoshi

Release-related discussions

Cruise catch-up while waiting for Thibaut:
- <500 objects: data may be very biased with abundances, esp. of rare things
- PlanktoScope software currently doesn't have a way to fix errors in metadata. For now, use batch edit on a filtered selection in EcoTaxa
- Duplicate objects flapping around will be a big problem for EcoTaxa. We usually label them as "artifact->ghost" on EcoTaxa, because they get partially subtracted by PlanktoScope. They'll have a strange color, etc. - so they're easy to recognize and separate from other objects. They'll still be counted as objects segmented by the PlanktoScope; until we get data into EcoTaxa, we won't know how much of the data consists of such artifacts.
- When bubble gets stuck in flowcell and the tubing needs to be pinched/unpinched. If only 10 images are affected by a bubble or by pinching/unpinching in a set of 400 frames, that's probably okay. But need to adjust the "total imaged volume". If big bubbles are <10% of the raw frames, don't worry about it too much - statistical impact won't be too much.
- Statistically, there's not too much risk to collect the waste sample so that we can put it back into the input sample if/when we need to restart an acquisition - as long as we maintain a low statistical risk of double-counting an object. This can actually increase the statistical significance of our sample. That's why a plankton net is recommended instead of CTD Niskin bottles.

Other updates:
- Fabien: Romain sent some new code to me, Colomban, etc. - not sure if you (Ethan) or Thibaut were aware, but now you know. Will forward the email to you.
- Important to make the code understandable and readable and simple.

Check-in about our v2023.9.0 release:
- Are we on schedule for a beta feature freeze (v2023.9.0-beta.0) today/tomorrow? Any adjustments to make?
    - Scope adjustment: Moved the "single SD card image build" goal ([#182](#)) out-of-scope of v2023.9.0 and will delay it to v2023.12.0, because the

pscopehat version of the Node-RED dashboard is actually different in various ways from the Adafruit HAT version, and it'd be too much work to try to merge together with the Adafruit HAT version before beta feature freeze; and we'd need to think about the UX for default hardware settings when selecting/changing the HAT type. For this release, we just have a single set of setup scripts which can be run to perform setup for either version of the HATs.

- Ethan: maybe have a way to choose a preset hardware.json file from a list of presets.
- Fabien: the Adafruit HAT should be deprecated at some point. All plans to replicate the PlanktoScope HAT are also on the internet. Might not be worth the energy to try to maintain full support for the Adafruit HAT, since the subsequent versions of hardware solve various problems. Let's make a pathway for people to switch HATs even still with the v2.1 hardware otherwise.
- Ethan: one option can be to not add any new features to the Adafruit HAT version of the software, but only major bugfixes.

- Changes of potential interest:
  - I deleted the "pscopehat" branch and moved the Node-RED flow file from it into https://github.com/PlanktoScope/PlanktoScope/blob/master/software/node-red-dashboard/flows-pscopehat.json .
  - I've removed logging from the Node-RED dashboard (screenshare demo). Instead, we now have links into Cockpit for live-updating logs, and links into a file browser for browsing old logs and downloading log files.
    - Note for Satoshi: I removed the "Network" management panel from Cockpit, so it should be safer to use now. However, I will keep Cockpit in the "for advanced users" section until I write documentation on how to use Cockpit (this will happen after v2023.9.0).
    - Fabien: Logging is precious when things fail, and only then. Previously, logs would fail. Logs were dated with the timestamps from the RPi's clock (also unreliable), so it was only practical if you cleared your logs regularly. No way to locate the correct log when all timestamps start at 1970. That functionality will become useful again in very few cases - i.e. bugs - only if three problems are solved together: the clock or naming of logs, the
    - Fabien: if we name the logs by a sequential index instead of starting timestamp, the logs would be easy to navigate again. Logs are needed when things aren't working (e.g. beta testing the

software, or after assembling a new machine). But at sea during operations, logs aren't very relevant.
- I've also removed Node-RED's "project mode" to simplify things and enable better file organization of the PlanktoScope repo.
    - Note for Thibaut: If lack of project mode makes software development difficult, I can restore "project mode" after moving the Node-RED dashboard out to a separate repo (which I plan to do anyways in order to deliver the Node-RED dashboard as a Docker container for easy upgrades/downgrades).
- I shrank and compressed all the documentation images in the PlanktoScope repo, from ~350 MB down to ~60 MB. Original files are now in our Google Drive folder.
    - Fabien: most useful part of the documentation is usage documentation.
    - Fabien: protocols.io also can do a json export. We could make something more interactive than a PDF using that JSON file. Like a checklist or an interactive protocol browser. Not sure how useful this would be.
    - Fabien: current protocols are outdated vs. the current development of the software. It's something which we'll have to investigate, but not urgent.
    - Ethan: 10-page custom protocol vs. 1-page checklist. Would've needed interactive software scaffold early on, then just an interactive checklist is needed.
    - Fabien: some metadata should stay the same between samples, e.g. sample name; but just change station ID, etc. All the logic isn't exactly present in the software UX.
- Remaining work before beta freeze:
    - Fix a regression introduced on the "Get MachineName" node in Node-RED
    - Add a small fix in the Node-RED dashboard for #166
    - Update the "Machine Version" dropdown in the Node-RED dashboard's "Hardware Settings" page to change the "PlanktoScope 2.3 (custom HAT)" option to "PlanktoScope v2.3-v2.6 (custom HAT)"
        - Fabien: changing the machine version causes the software to do things which maybe cause crashes.
        - Ethan: will test out changing the dropdown option. Maybe just make the dropdown a read-only dropdown

- - - Satoshi: there are 2 v2.6 hardwares: one has the larger custom PlanktoScope hat, and one has the smaller custom PlanktoScope hat
      - Fabien: design may be different, but is the software controlled the same?
      - Ethan: different HAT designs should mean different hardware version numbers
    - Update changelog and draft of release notes for v2023.9.0-beta.0
- What's our test plan for beta testing?
  - Beta freeze on Sept 1
  - Within one week (or 2 weeks?) after beta freeze:
    - Check if #173 has been solved or still occurs
    - Update internal software documentation
    - Thoroughly test the new software version amongst ourselves
    - Make a "what's new" video/screencast?
      - Fabien: wait until we have enough time to test internally before investing time on this
      - Ethan: maybe just make the "what's new" video for the final software release
      - Fabien: "what's new" video probably isn't needed for beta - just provide release notes, maybe with one or two screenshots. e.g. URLs are easier to copy-and-paste from text than from video. Video probably isn't worth the effort if most changes are behind-the-scenes. If the entire UX is changed, etc., then a "what's new" video may be worth it.
      - Decision: let's not do a "what's new" video for this release
    - Fabien: save 2 weeks for this phase.
  - One week (or 2 weeks?) after beta freeze:
    - Announce the beta software prerelease to the general channel of our Slack workspace, asking for help in testing it out, and feedback on anything which needs improvement?
      - Ethan: Include a note that it's not ready for production use
  - Finish the beta testing phase (Sept 28th?)
    - Fabien: keep release dates internal, don't make promises. Leave slack time to fix any major new bugs discovered during beta testing.
    - Ethan: future releases: start beta testing earlier to leave more slack time up front for bugs in beta
  - Fabien (discussion): feasibility of replacing raspimjpeg with libcamera?
    - Ethan: definitely feasible.

- Fabien: the initial versions of PlanktoScope had better images vs. the actual version. I think raspimjpeg is there but at a very bad cost of getting worse images (less colorful, more overexposed, reducing the usability of the data)
- Satoshi: Ethan, did you have scotch tape over the light in the Arctic?
- Ethan: no; on my v2.6, images were very dim (extremely dim in preview)
- Satoshi: I had that issue too. My images were darker than on Fabien's PlanktoScope.
- Fabien: most v2.6 PlanktoScopes freshly assembled by Thibaut produce overexposed images. To solve that, I had to put one or two layers of translucent scotch tape directly over the light. In previous versions, I removed the infrared filter because those filters degraded after a while. This issue happened simultaneously with raspimjpeg overexposure. This leads to very overexposed images.
- Fabien: on units where I removed the infrared filter, I glued some small glass plates instead. That solved a large part of the issue - it's also like an optical filter for non-visible wavelengths. But if we remove the raspimjpeg layer, then we get back to having complete control over the camera. Right now we don't have complete control - can't actually regulate camera gain, only ISO and WB. With full camera control, we can have very very nice images and get repeatability in settings.
- Ethan: I believe Wassim will work on replacing raspimjpeg with libcamera. I will provide support on this.
- Fabien (discussion): did a PlanktoScope training early summer. This was a chance to play with intercalibration among machines (esp. white balance). Calibration procedure is simple: just take an image without any sample, record mean RGB value of image, and adjust current WB value to obtain even values on the three color channels. This could be easy to automate - 5 lines of

spreadsheet formula.

- - Ethan TODO: make a feature request on GitHub Issues for automatic calculation of manual white balance values to use.
  - Fabien: raspimjpeg vs. libcamera probably won't affect the WB calibration behavior. Switching between preview stream and image saving seems to cause an autocontrast on the first acquired image (big problem because all the settings are messed up, in a way that depends on contents of flow cell), but probably not related to white balance.
- What needs test coverage during beta testing?
  - Ethan: medium-sized behind-the-scenes changes have been made to the Node-RED dashboard and Python backend this past week. Needs thorough testing for accidental breakage caused by my changes, esp. the pscopehat version.
  - Ethan: potential breakage with anything which previously involved or used the "baba__-" machine names.
  - Ethan: need usability feedback on the new "Administration" page of the Node-RED dashboard.
  - Ethan: GPS? GPS clock? RTC? esp. on v2.1 hardware. GPS might be completely broken
    - Fabien: don't need to worry too much about GPS feature - currently it's 100% useless. It could be useful if the PlanktoScope was able to actually

acquire unfiltered water so that we could use it on an inline system (like IFCB). Even with IFCB, you still need to artificially aggregate 5-10 samples to reach statistical significance (except maybe in some coastal blooms). You can start to play with normal statistics once you have ~30 objects per category; categories below that are just qualitative ("present vs. not present") rather than quantitative.

- Fabien: GPS clock-updates are more important than GPS coordinates themselves. But the time isn't necessarily updated to everything - e.g. the log file starts once the PlanktoScope starts, so if you don't have a GPS fix at the start, then the log file will have an incorrect timestamp.
- Fabien: RTC is normally present on the PlanktoScope HAT. RTC is a higher priority than GPS or GPS clock.
- Fabien: on previous version of software, RTC was not working (or maybe I just never set the correct time initially - I never investigated the issue) - it was present on the HAT, but there wasn't software support. I did have some PlanktoScopes which suddenly (magically) got the correct time - they were in the middle of a boat, without GPS. That unit was used a lot and was connected to various devices.
- Ethan TODO: add a GitHub Issues request/bug report to make the RTC on the new PlanktoScope HAT work
- Ethan TODO: test out the v2.6 PlanktoScope and make it get time from the internet and test out the RTC with the PlanktoScope disconnected from the internet
- Ethan: (discussion about PlanktoScope sharing internet with other devices)
- Fabien: when you connect PlanktoScope to internet over wifi, then the PlanktoScope's wifi disappears.
- Ethan: right - would need either Ethernet connection or a USB dongle for a second wifi interface
- Ethan: Adafruit HAT vs. PlanktoScope HAT testing
- Fabien (shared photos from the PlanktoScope workshop, discussed what attendees were trained to do)
  - (discussion of differences in hardware and optics and flowcells between different generations of the PlanktoScope hardware, leading to variation which needs to be handled by calibration)
  - Fabien: calibrated WB results may be changed by the specific flowcell used. Even dirtiness of flowcell, or use of Lugol, might change the WB characteristics. Hard to have stable WB measurements if you still use flowcell. So I prefer to intercalibrate PlanktoScopes in absence of flowcell, maybe not worth the effort

to try to calibrate among different flowcells (but it might matter a lot, especially between ibidi vs. capillary flowcells).
- What is our target date for the final v2023.9.0 release (i.e. how long do we plan for the beta phase to last)?
    - Decision: Sept 28th will be an internal (not public) target for the release date
- What documentation improvements need to be finished for the v2023.9.0 release? (recall that the software release will include a snapshot of the docs for offline access)
    - These are mostly notes for Thibaut
    - Ethan: https://planktoscope.github.io/PlanktoScope/hardware/manufacturing/ is missing the PlanktoScope-Case.dxf and Planktoscope-Hat-throughhole.csv files (those files have not yet been uploaded to the GitHub repo) Also, some other links to hardware files are broken (e.g. https://planktoscope.github.io/PlanktoScope/hardware/manufacturing/#manufacturing-files_1) - I'll need to determine whether those files are also missing, or whether the links are merely incorrect.
    - Ethan: can we put the enclosure design & fabrication files on GitHub somewhere, both for v2.1 and for subsequent versions?
    - Ethan: new documentation doesn't yet describe the v2.1 hardware. Do we need to resolve this before the v2023.9.0 release of software (including the offline copy of the new docs site)?
        - Fabien: technically, we know that v2.1 is kind of heavily biased and has lots of hardware bugs, which we don't necessarily want to encourage people to replicate. The PlanktoScope itself…I still see people referring to the old version of the hardware. Each time I find people trying to replicate the PlanktoScope, I tell them there is a newer version which may be preferable, because the old version produces biased samples (plankton get clogged in the corners of the fluidic system). Don't want to encourage people to replicate machines which we know cause sample bias.
        - Fabien: I don't want old version to disappear, but I don't want the old version to be on our golden path or to be the first thing people see.
        - Satoshi: Adafruit HAT + Fan HAT is much easier for us to source and build ourselves, so some Japanese colleagues still prefer that.
        - Fabien: that's mostly because there's no way (note for Thibaut) for people who want to just buy the PlanktoScope HAT.
        - Satoshi: Thibaut still hasn't made that available yet.
        - Fabien: challenge with the Adafruit is that it's longer - it needs to be next to the RPi. So it doesn't fit in the new enclosure of the PlanktoScope. Thibaut wants to try to make the box smaller and smaller, so he wanted

to make the HAT even smaller. So the enclosure dimensions are the only thing which prevents using the Adafruit HAT.
- Ethan TODO: copy in missing hardware files from https://github.com/PlanktoScope/PlanktoScope/tree/experiments/sourceindex-mkdocs-hatch-nixenv-reusespec-okhspec-reorganizefiles/hardware . Follow up with Thibaut about any remaining missing files.
- Fabien: we agreed with Thibaut that ideally PlanktoScope v2.3 should remain public and easy to replicate, but starting from v2.3 we should emphasize the new version of hardware.
- Fabien: I have the dxf file for the hardware version described in the current version of the documentation.

2023-08-24

In attendance: Satoshi, Thibaut, Shameera, Ethan

Individual updates + follow-up discussions

- Shameera (introduction):
    - Undergrad working on the PlanktoScope. Antarctic samples - in-ice and under-ice plankton
    - Ethan TODO: share protocols & log sheets from Arctic planktoscope operations
- Ethan
    - Progress updates (just the highlights)
        - Moved the backend out of https://github.com/PlanktoScope/PlanktoScope and into a new repo at https://github.com/PlanktoScope/device-backend. Locked indirect dependencies using poetry.
            - Future merge conflict warning: Modified the Node-RED dashboard flow file to launch the Python backend via Poetry.
            - Next step: split up the hardware controller and the segmenter into two separate Poetry projects within the device-backend repo, each with their own set of dependencies. This way, the segmenter can be installed without installing any RPi-specific packages. Then (maybe after the v2023.9.0 release) we can probably move the segmenter into a Docker container, run it on non-RPi computers, etc.
            - Proposed next step (before the v2023.9.0-beta.0 prerelease): move the backend code from the pscopehat on the PlanktoScope repo into a subdirectory in the device-backend repo, sitting

side-by-side with the adafruit hat version of the code. Maybe make the Node-RED frontend able to toggle which backend program to run. After v2023.9.0, we can then gradually re-unify identical code between the pscopehat and adafruit-hat versions.
- Updated & simplified the software [basic install](#) and [expert setup](#) docs pages
- Remaining work (just the items which need discussion/decision-making; see [v2023.9.0 milestone](#) for everything else)
    - Documentation: images are too big (overall website is 410 MB download for the PlanktoScope!!). How do we want to proceed with shrinking the images for the docs?
        - Thibaut: annoying that we have to do this for the next work (v2.6 of hardware) as well - 200 MB of pictures as well. How will we handle documentation for every version of hardware? Maybe a small video could be easier?
        - Ethan TODO: look into having an image compression step as part of the MkDocs build, to at least shrink the size of the built artifact of the docs site for downloading onto the Raspberry Pi
- Check-in about our v2023.9.0 release: Are we on schedule for a beta feature freeze in one week? Any concerns about the schedule? Any adjustments to make?
    - On track!
    - docs.planktoscope.org: Thibaut will try to ask Plankton Planet to make this happen, but we can't rely on it.
    - Ethan TODO: follow up with Thibaut to launch docs-edge.fairscope.com
- Thibaut
    - Size of the images are different depending on the camera used. 5000Ko on the Picamera V2.1 (official PlanktoScope v2.1 design) and 500Ko on HQ (official PlanktoScope v2.6 design, and some unofficial mods to PlanktoScope v2.1) - why ?
        - Images posted on slack: [https://planktoscope.slack.com/archives/C01V5ENKG0M/p16928895678 08739](https://planktoscope.slack.com/archives/C01V5ENKG0M/p169288956780 8739)
        v2.1 camera from v2.1 PlanktoScope:

HQ camera from v2.6 PlanktoScope:

- Ethan comparison image on v2.6 PlanktoScope from the Arctic:
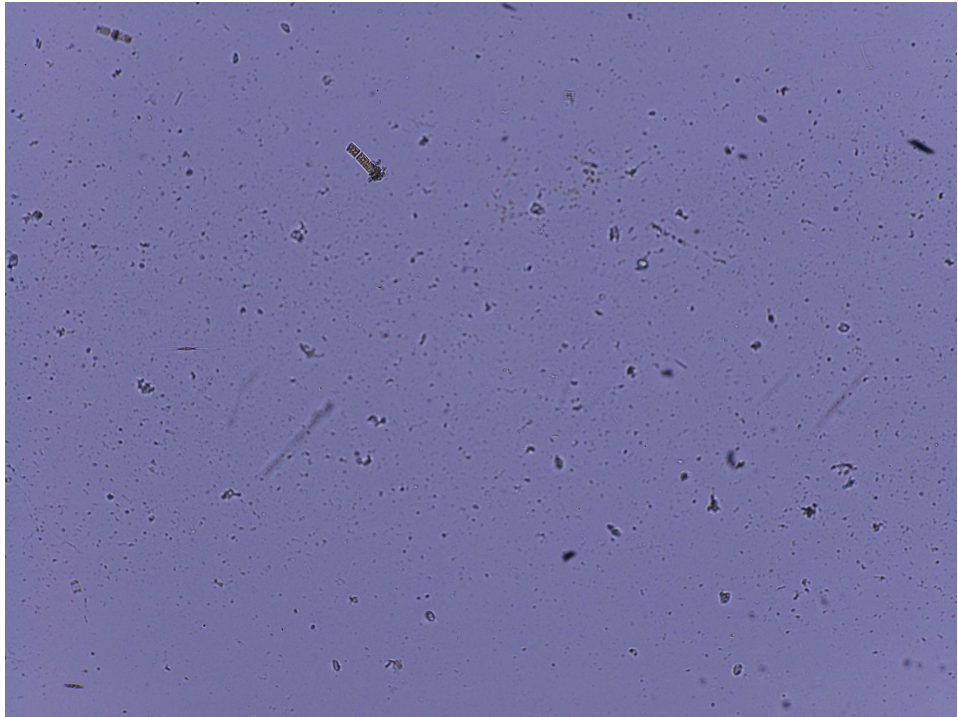
    - Ethan: uniform white background explains the much smaller filesize. Not sure why the background is so much more exposed than on my PlanktoScope
    - Thibaut: the difference may be related to raspimjpeg library. Less likely to be an LED issue (but if so, there are implications for inter-machine calibration)
- Anna is finishing her internship
- Wassim is starting beginning of Sept.
- OS images - https://drive.google.com/drive/folders/1xzZ8Yt9wvMQIiT-2XPKxsvc-Wycm8bDf?usp=drive_link
    - Thibaut: this is an internal folder
    - Thibaut: the FS images are the FairScope software configurations of the software. Integrating some settings for FairScope hardware - e.g. pixel size calibration, focal length of tube lens
    - Ethan: had also made a folder for development stuff at https://drive.google.com/drive/u/1/folders/1k3378NQnuf4mflwWWN3b7uODTpKSt9DH
    - Decision: we'll keep both folders and use them specifically for our own purposes.
- Satoshi
    - PlanktoScope v2.6 test

- Satoshi: Getting lots of out-of-focus images. Any way to improve the depth-of-field? How to treat many outfocus images?
    - Hardware - will test tube lens with larger f-number than the standard one (have just ordered - will arrive within several weeks)..
    https://www.edmundoptics.jp/f/blue-series-m12-imaging-lenses/13096/
        - Thibaut: the lenses linked above are expensive, but if the quality is much better than the current ones ($5 each), the quality & robustness improvements to our data may be worth it. Could have an intern start in January to characterize different lens combinations/configurations and resulting data quality.
    - Software - Should we add some tricks to remove out-of-focus images?
    eg.
    https://pyimagesearch.com/2015/09/07/blur-detection-with-opencv/
        - Ethan: blurriness could be a useful metric to compute on objects to aid quality control. But objects could be low-edge-contrast/sharpness without being out-of-focus (though out-of-focus is probably the most common cause of low-edge-contrast/sharpness). Maybe start with making suggestions about which images are out-of-focus, and then see how accurate we are vs. human judgement?
        - Satoshi: right now we have lots of out-of-focus images which are hard to classify.
        - Ethan: maybe add a blurriness metric and train EcoTaxa models with an "out-of-focus" label
        - Satoshi: this has implications for bias in quantification of cells though
- Will take a lot of HAB species cultures in our institute in forthcoming couple of weeks.
    - Ethan: would be helpful if you have a PlanktoScope dataset of an Alexandrium culture!
- Planning to find a golden standard to take images of HAB species by ICHA2023 (together with some colleagues in Japan).
    - Thibaut: key element of HABs detection will be to get image datasets of HAB species

- Thibaut: Roscoff cultures of very small phytoplankton. Right now PlanktoScope isn't able to distinguish very small species. Maybe better optics could help?
- Thibaut: Scripsiella dataset on EcoTaxa with custom optics (higher mag, 50 um capillary).
- Satoshi: "movie mode" would be very useful so we can record plankton movement behavior.
- Channels of other languages on slack - hoping to add a channel to have a chat using Japanese (language). Such channel would be beneficial for people who are not good at English and foreigners can see what we are talking about with translation softwares.
    - Thibaut: would be good to facilitate communication from non-English speakers. One idea raised in the past was to have an app in Slack to aid translation (e.g. https://planktoscope.slack.com/apps/A0ZJS6Z7E-translate)? Didn't investigate that much.
    - Ethan: I really like idea of having channels in other languages as a way to help non-English communities form organically, whether or not we have an app integration. Minimum necessary process to implement this change: a way for people to ask us to create a channel for a certain language, and then we announce that change somewhere
    - Shameera: There's another app which automatically translates a channel's entire messages into any selected language.

Other time-sensitive discussions

- Thibaut: will not be attending the next meeting (still on vacation)
    - Ethan: beta feature freeze checkpoint next week
    - Thibaut: I'll just join the next meeting to make it easier
    - Ethan: we can keep that a short meeting
- When will we choose a time for weekly work calls with Thibaut, Ethan, and Wassim on Thursday CEST?
- Annual PlanktoScope workshop: which month will we target for our next workshop? What will be our next steps, and who will do each task?

Long-term discussions

- FairScope mission: What is the value of FairScope? What activities should FairScope focus on? Product innovation work, manufacturing, other kinds of activities?
- FairScope business strategy & software product strategy (refer to this comment) and the FairScope company's mission, principles & values

- FairScope hiring: what should be the next position we hire internally in FairScope?
- Software platform values to guide decision-making (see the "Our technology's values as a platform" section of 📄 Software Strategy) - anything to move into core values & secondary values? Anything to reorder? What's missing from the list? (wait until Satoshi can join a meeting before discussing this)
- Inter-machine calibration
- Improving computer & network security of the software (refer to this section)

2023-08-10

In attendance: Thibaut, Satoshi, Ethan

Individual updates + follow-up discussions

- Ethan
    - Remaining items from previous meeting:
        - Added issue #166 (reported by Gilles) to our v2023.9.0 release milestone because it's a bug that can be pretty difficult to troubleshoot, and it has happened to at least 3 different people in the past 6 months.
            - Ethan: will need backend fix and frontend fix
        - Made various improvements to the correctness & usability of the Forklift prototype (the software configuration management tool for updates & third-party apps). PRs: forklift#37, forklift#38, forklift#42, forklift#45.
        - Fifty 50: had a meeting/interview, no follow-up.
        - (discussed about Ethan's thesis timeline plans & post-thesis plans, Thibaut & Manu's preliminary planning for building a FairScope team in the US)
        - Ethan: v2.6 doesn't have micro-HDMI output or OLED screen. I missed both of those things
            - Thibaut: micro-HDMI support would be trivial to do
    - New updates:
        - Made additional improvements to the correctness & usability of the Forklift prototype, and the readability of the Forklift spec; also switched Forklift to deploy Docker Compose apps rather than Docker Stacks (Docker Stacks has various limitations relevant to us). PRs: forklift#46, forklift#47, forklift#48 (almost ready to merge)
    - Plan for upcoming week:
        - Ten-earth project:
            - Try to mount Google Cloud Storage bucket so all data gets saved directly to Google Cloud

- Will start a 1-week continuous monitoring test on 8 PlanktoScopes simultaneously
    - Thibaut: due to sedimentation in the tubing and flowcell, might need to have a pumping step before imaging
        - Ethan: this makes a good argument in favor of imaging every hour for our earlier tests, since we can't easily do a pumping step in software yet for the 15-sec interval imaging
    - Thibaut: to avoid fouling, one solution could be UV LEDs that can be toggled
- PlanktoScope software maintenance:
    - Start+finish #138 (will move Python backend - both the adafruit_hat and pscope_hat branches - into a separate repo).
    - Split the Python backend into two separate GitHub repos, Python packages, and Python commands: segmenter, and hardware-controller
    - Use systemd to supervise the Python processes, and make Node-RED "restart hardware controller" and "restart segmenter" buttons run systemctl restart commands
    - Follow up on Satoshi's software testing report/feedback.
    - Maybe also do the next task in #132, fix #166, start #139.
- Thibaut
    - Remaining items from previous meeting:
        - Write blog articles on planktoscope.org
            - Thibaut: still waiting for discussion from Plankton Planet.
            - Thibaut: it makes sense to enable everyone to write and share their experiences & knowledge. Even Plankton Planet could write about what they're doing with PlanktoScope.
    - New updates:
        - Discussion on the hardware related to Ten-earth. The "decision" with Manu was to provide the HAT to robustify the hardware especially the pumps for the experiment.
            - Thibaut: Manu will be visiting Brest soon.
            - Ethan: (discussion about design deviations in v2.1 PlanktoScopes; sources of robustness issues)
            - (discussion about using PlanktoScopes to monitor lab cultures)
        - Onboarding for Wassim
            - Thibaut: Wassim will progressively on-board in September. 6 months half school half internship (co-op) - working with FairScope on Thursdays and Fridays; after 6 months, it'll be

full-time internship. We can have him join this call to discuss and present things to everyone. Work towards enabling him to collaborate with Ethan.
- Thibaut: September will be busy, so the meetings may need to be rescheduled or extended to 2 hours to discuss things. Starting in September, maybe have a second meeting then? Preferably Thursday.

Other time-sensitive discussions

- What is our plan regarding the work Romain did?
    - Thibaut: I looked at what he did and was trying to solve. It was low-level tasks, e.g. solving the raspimjpeg exposure/ISO level bugs, etc. I'd prefer to not integrate any of what he did - his work in Node-RED adds a lot of complexity for various simple things.
    - Thibaut: his code related to toggling the LED is 400 lines (MQTT messages). Toggling of 2 LEDs (none of the planktoscopes have a second LED. I tried to slightly decrease the LED intensity and looked at the code, and the code was very complicated for just toggling the LED.
    - Ethan: sounds like if we have a list of the problems Romain was asked to solve, we might just do that ourselves.
    - Thibaut: if we need to re-do the GUI ourselves, maybe we can do this work after refactoring (i.e. simplifying) the Python code somewhat.
- What is our plan for onboarding Wassim?
    - (discussed above)
- Next meeting:
    - Will cancel the meeting for August 17th; next meeting will be August 24th
    - Ethan: I'll work on release prep tasks
    - Thibaut: I'll work on the GUI
    - Satoshi: I'll have some internship students in that week. Won't be able to attend.
    - Thibaut: will have a conversation with manufacturer & designer for the HAT for the next version. We can discuss this in the next meeting. Could be useful to have your input on what is useful & relevant in the next version.
- Check-in about our v2023.9.0 release. Any concerns about the schedule? Any adjustments to make?
    - Plan to go into beta on August 31st, full release around Sept 28th
    - Thibaut: I tested the v2023.9.0-alpha.0 prerelease with the planktoscope hat code. All of that was working for me. Just two Node-RED GUI nodes which still had the old domain names for the mjpeg streams. Internet sharing was working. The file browser was very nice. I've been able to reproduce the problem Satoshi

had reported about needing to restart Python right after rebooting the PlanktoScope; most of the time the initialization wasn't totally complete, and I had to restart Python.

- Thibaut: When I build a machine, I test all of the functionalities using the software; it's annoying to not be able to easily access what's been happening in the Python. It'd be nice if we turn on the machine and an LED blinks, but we don't know why; the pump moves a bit to show it's moving, the focus motors move up and down. Like a power-on self-test which the operator looks at.
    - Ethan: do we need this at every boot, or would it be sufficient to just have a button in the GUI to run the self-test sequence?
    - Satoshi: this would be nice to have it on every boot.
    - Ethan: maybe we could the self-test sequence on boot by default, but make that disableable.
    - Thibaut: either way, could still be nice to have a GUI button to test it.
- Should we shift meetings to be earlier by an hour?
    - We'll keep it at the current time

Long-term discussions

- Annual PlanktoScope workshop?
    - Thibaut: the first workshop was a big success - ~100 people on Zoom call for an event planned a few weeks before. Users were happy discussing what they were doing. Target planning a workshop around October or December.
- FairScope mission: What tasks should FairScope focus on? Product innovation work, what kinds of activities? What is the value of FairScope?
- FairScope business strategy & software product strategy (refer to [this comment](#)) and the FairScope company's mission, principles & values
- FairScope hiring (what should be the next position we hire internally in FairScope?)
- Software platform values to guide decision-making (see the "Our technology's values as a platform" section of 📄 Software Strategy) - anything to move into core values & secondary values? Anything to reorder? What's missing from the list? (wait until Satoshi can join a meeting before discussing this)
- Inter-machine calibration
- Any new insights/questions about software licensing (refer to [this comment](#)) based on FairScope business strategy, PlanktoScope product strategy, PlanktoScope technology values, and product strategy & technology values specifically for PlanktoScope software
- Improving computer & network security of the software (refer to [this section](#))

2023-08-03

In attendance: Thibaut, Ethan, Adam

Individual updates + follow-up discussions

- Ethan:
    - Report from ToTS cruise on R/V Sikuliaq:
        - PlanktoScope was powered on continuously for approx. 45 days and used to image 15-20 samples/day on average.
        - Stats from [post-cruise report](#) (last updated 2023-07-28): We analyzed 254 seawater samples from 124 CTD stations (typically with samples collected from the surface and from the subsurface chlorophyll maximum), 12 samples from melted ice cores (collected from 11 stations), 48 samples from sediment traps (from 24 deployments of sediment traps at two depths per deployment), and 446 samples from plankton culturing experiments.
            - (brief discussion of sedimentation and buoyant plankton which could've been missed in imaging)
        - Sample-processing protocol development & operations:
            - Final protocol + protocol checklist (constructed after we found ourselves often forgetting various steps of the protocol):
              📄 PlanktoScope SOP
            - Spreadsheet for tracking: 📗 PlanktoScope Log Sheet
            - 20 um wet-filtration system for concentrating CTD Niskin bottle samples or plankton culturing experiments from 500 mL of raw sample down to ~10 mL of concentrated sample
            - Wet-filtration process for concentrating samples from CTD Niskin bottles & culturing experiments
            - Per sample: 400 images with pumped volume of 0.02 mL/step and 0.1s delay - total pumped volume of 8 mL, total imaged volume of 0.83 mL. # of objects from CTD samples ranged from <300 (very sparse samples) to >6000 (very dense plankton blooms). Usually at least 500-1000 objects per sample.
                - (discussion of image processing workflow, and need for a way to catch everything in segmenter while splitting it off into recognizable vs. unrecognizable objects afterwards)
            - File browser for downloading each dataset as a .tar.gz archive
        - Computer networking setup: Planktoscope RPi + GUI kiosk RPi + segmenter RPi; Planktoscope & segmenter were connected to GUI kiosk

by Ethernet cables. GUI kiosk had ship wifi, usually shared internet to other RPis. Planktoscope + segmenter RPi were configured to not act as DHCP/DNS servers on 192.168.5.1. Detailed software configurations + bring-up notes recorded at 🟩 PlanktoScope Inventory (also refer to the "Bring-up notes" rows on each spreadsheet tab)
- (briefly discussed relative slowness of segmenter on the RPi vs. image acquisition on the PlanktoScope)
- Regarding https://planktoscope.slack.com/archives/C015K99AJAE/p168872 2294778739: I am planning to split off the Python segmenter from the Python hardware control software for our v2023.9.0 release milestone.
- Image processing pipeline automation: https://github.com/ethanjli/tots-planktoscope-scripts
- Issues experienced:
    - GUI flow does not match sequence of steps in sample-processing protocol, leading to occasional incidents where a step was forgotten (especially: sample page should be between optic configuration and fluidic acquisition - we often forgot to update station IDs or operator names).
    - "Sample Info" page made assumptions which were inappropriate for our sample-processing operations, esp. since we only had certain fields of information at image acquisition time (other information were not immediately available, or because our Niskin bottle samples were from 500 mL aliquots of a large Niskin bottle, rather than a full 12L or 24L sample). We just used "Test Sample" as the sample type for all samples, planning to later merge in metadata from our logsheet by software in post-processing. Post-processing software is anyways needed in order to correct mistakes in sample metadata (e.g. an operator forgot to update the Station ID or Acquisition ID), which is locked by a data integrity file - this is annoying! I want a software mode where we don't enter any metadata in the PlanktoScope GUI (because that GUI page sucks) and instead just cross-reference metadata from a custom logsheet using post-processing software. The important thing is to make sure that structured metadata is recorded somewhere, and we should be able to let the operator choose a method most appropriate for their operations.
    - Need a better, standard, more-automated way to download individual datasets separately (we sometimes forgot to download

datasets, or forgot to delete datasets before starting the next one).
- (TODO in coming months: discuss dataset organization)
- A few times per week, after finishing one dataset, the Python backend would stop working: I'd press the pump button, the GUI would show a notification from the backend that pumping started, but the pump wouldn't move. We were able to work around this by restarting Python, but the root cause of this recurring problem is unclear and we have not been able to reliably reproduce it. (After meeting comment from Satoshi: Yes, I am suffering from the similar issue as Ethan and am happy if it was solved.)
- Official V2 protocol left some things unclear, and was not designed for processing CTD samples (which is what we needed to process!). We had to make our own custom (i.e. nonstandard) protocol.
- Official V2 protocol didn't provide advice on frequency of bleaching. In practice, we needed to do it at least approx. once every week, or once every few days on days where the PlanktoScope was being operated every hour.
- Has the LED gotten dimmer over the course of the cruise? Need to check, but by the end of the cruise, the camera preview with ISO 100 (which is the setting required by the official v2 protocol for image acquisition) feels very dim in the camera preview.

(ran out of time, didn't get to discuss any of the remaining topics:)
- Dimensions of the 200 um filter were very awkward for filtering into a 50 mL Falcon tube. Would be very helpful if the red 3D-printed ring of the filter were shaped for insertion into the top of a 50 mL Falcon tube to prevent any loss of fluid (because loss of sample fluid in the 200 um filtering step occasionally happened).
- Would be nice if a funnel were provided for pouring sample into the sample intake syringe body. I sometimes spilled tap water, esp. when pouring in ~25 mL of tap water to flush the sample intake tube between samples.
- The Planktoscope takes ~15 min to image 400 frames, and ~5 min to download the resulting 2.2 GB dataset as a .tar.gz archive. This meant that, on busy days, we would have ~15 min of downtime between samples, which made it hard to do anything other than check twitter/instagram while waiting (15 min is not enough time to do real work, due to the cost of context-switching

between tasks). Many operator mistakes were made when operators were partially distracted, or couldn't properly multitask with the context-switching between PlanktoScope operations and other tasks, or otherwise had high cognitive load. A wizard-like (i.e. highly-scaffolded) GUI is supposed to relieve the operator of having to keep track of various things, yet it didn't do that for us.

- Added issue [#166](#) (reported by Gilles) to our v2023.9.0 release milestone because it's a bug that can be pretty difficult to troubleshoot, and it has happened to at least 3 different people in the past 6 months.
- Made various improvements to the correctness & usability of the Forklift prototype (the software configuration management tool for updates & third-party apps). PRs: [forklift#37](#), [forklift#38](#), [forklift#42](#), [forklift#45](#), [forklift#46](#) (almost ready to merge).
- Following up with [Fifty 50](#)
- Thibaut
    - 🟩 Metadata Compilation in a centralized place with relevant information associated with each of them such as the units, the description and the potential calculation done to get them from other metadata
    - Reshaping the PlanktoScope GUI in order to simplify the user experience thanks to a prototype on Balsamiq https://balsamiq.cloud/so3zzxh/p83xugi/rC331
        - Would be nice to have a working session on designing the next GUI
    - Overexposition notified on the recent V2.6.1 since the IR Filter has been removed. Tentative to reduce the LED intensity or to be able to play with it but the code seems super complicated for a simple toggle on and off current situation
    - Extending possibilities by proposing other mag and other flowcells

(ran out of time, didn't get to discuss the following topic:)
- Write blog articles on planktoscope.org

Other time-sensitive discussions

- What is our plan regarding the work Romain did?
- What is our plan for onboarding Wassim?
- Check-in about our v2023.9.0 release. Any concerns about the schedule? Any adjustments to make?
- Should we shift meetings to be earlier by an hour?

Long-term discussions

- FairScope business strategy & software product strategy (refer to [this comment](#)) and the FairScope company's mission, principles & values

- Software platform values to guide decision-making (see the "Our technology's values as a platform" section of 📄 Software Strategy) - anything to move into core values & secondary values? Anything to reorder? What's missing from the list? (wait until Satoshi can join a meeting before discussing this)
- Inter-machine calibration
- Any new insights/questions about software licensing (refer to this comment) based on FairScope business strategy, PlanktoScope product strategy, PlanktoScope technology values, and product strategy & technology values specifically for PlanktoScope software
- Improving computer & network security of the software (refer to this section)

2023-07-27

2023-07-20

In attendance: Thibaut, Satoshi

Individual updates + follow-up discussions

- Satoshi :
    - He is back in Japan.
    - He now has a **PlanktoScope V.2.6** from **FairScope** to image with.
    - He connected **Thibaut** and Sea Breath about them becoming resellers for FairScope.
- Thibaut :
    - He did some testing with another magnification (25mm / 4mm) and other flowcell (50um) on the **Roscoff Culture Collection** notably **RCC1627** and uploaded the data on **EcoTaxa**. https://ecotaxa.obs-vlfr.fr/prj/9626. The output of this experiment is very promising.
    - He downloaded a fresh **Raspbian OS with desktop and recommended softwares** and run the code from Ethan to setup the needed libraries and dependencies from the main branch. It's working nicely. He used the script from Romain's branch in order to benefit from his input and he started some work on a new GUI. He is about to release a beta version of this.
    - He started a table compiling the metadata used in the project : Metadata Compilation. This document will help the coding experience.
    - There is a clear need to work on the **PlanktoScope API** to establish a standard.
    - A contract working on the code will start in early September in part time. His name is **Wassim**.
    - He sent 17 units of the PlanktoScope V.2.6 to Fabien at Villefranche.

2023-07-13

canceled

2023-07-06

canceled

For previous notes, please look into this document : 📄 2023-01 to 2023-06 Meetings