vrecord:
An Open Source Case Study

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Who are we?
What is vrecord?
vrecord is:

- A way to digitize (analog) or transfer (digital) video
- Designed for AV archivists
- A 2014 Hack Day project shepherded by Dave Rice
- Open-source software - a tool to which you can contribute!
- A flexible, customizable tool
From the [vrecord documentation](#)
Options geared towards AV archivists
Lots of logs
Open source software is:

- **Available**: It can be used by anyone
- **Decentralized**: It can be modified by anyone
- **Public**: Its source code is available for inspection and study
- **Collaborative** (in the best cases): Contributors share, discuss, approve, and clarify as a group
Challenges of open source

- **Relies on volunteer work**: Maintenance of vrecord is not written into anyone’s job description, even if it is integral to their work.
- **Maintenance**: Open source tools can easily break when dependencies update (such as FFmpeg or the BlackMagic drivers).
How to contribute to vrecord:
1. Writing code
2. Testing and giving feedback
3. Using vrecord and training others
Writing code (even if you’re new!)

- vrecord is written in Bash, the language of the Mac/Unix command line
- Free tutorials are abundant
- Borrow from existing code
  - Mimic syntax, change values
- Ask others to review/test your code
  - Pull Request
- It’s ok to make mistakes!
But you don't have to write code!

- Documentation
- Typos
- Feedback
- Error logs
- Commiserating
- Supportive emojis
Changes to code (work on the code in your own “branch,” then propose merging your changes in a pull request)

Download the code to make changes locally

History of the code

Feedback and questions

Individual scripts and documents
[wish] suffix/prefix custom settings
#342 opened on Jun 20 by libbyhopfauf

Issue with display timer speed
#341 opened on Jun 20 by libbyhopfauf
Perspectives: Savannah Campbell
First Pull Request Failure

savcampbell commented on Oct 5, 2016

No description provided.

Added Color Matrix Filter and Edited Out cropdetect

dericed commented on 21a419e on Oct 5, 2016

I think your fork was out of date as this undoes some of @privatezero's recent changes.

redid color matrix addition
Learning GitHub Etiquette

savcampbell commented on Nov 22, 2016
Saturation warning adjusted to report on illegal values in both 8-bit and 10-bit captures.

savcampbell added some commits on Nov 22, 2016
- Merge branch 'master' into 10-bit-saturation-warning
- Saturation warning adjusted for 10-bit

savcampbell commented on Nov 22, 2016
Fixes #96

dericed commented on Nov 22, 2016
LGTM

dericed merged commit 1586a51 into amiaopensource:master on Nov 22, 2016
Built-in QC Features
User Feedback and Testing

savicampbell commented on Apr 27

After updating vrecord to the latest version, I was getting the same error message as Libby. Running `brew reinstall qcli --HEAD`, `brew reinstall mpr`, and `brew reinstall bmdtools` fixed that issue, and record mode is running again. However, I am now getting a ton of errors that look like this:

```
[decklink @ 0x7fe8ff0e0300] Decklink input buffer overrun!
   Last message repeated 20927 times
[matroska @ 0x7fe8ff0e0f0a00] Starting new cluster due to timestamp
[decklink @ 0x7fe8ff0e0300] Decklink input buffer overrun!
   Last message repeated 12926 times
  av_interleaved_write_frame(): Broken pipe
[decklink @ 0x7fe8ff0e0300] Decklink input buffer overrun!
   Last message repeated 3 times
[nut @ 0x7fe8ff0f0c00] Multiple keyframes with same PTS
   Last message repeated 18063 times
[decklink @ 0x7fe8ff0e0300] Decklink input buffer overrun!
[nut @ 0x7fe8ff0f0c00] Multiple keyframes with same PTS
[decklink @ 0x7fe8ff0e0300] Decklink input buffer overrun!
[nut @ 0x7fe8ff0f0c00] Multiple keyframes with same PTS
   Last message repeated 2580 times
```

And the resulting video files have sync issues.

This might be a separate issue, though it only began for me after the latest update and reinstalling qcli, bmdtools, and mpr. I'm running the latest version of the BlackMagic drivers as well.

aeschweik commented on May 8

Hi @savicampbell, when you get a chance would you mind testing with `brew reinstall vrecord --HEAD` and choosing to create a QCTools XML after the transfer? (It'll be a new option in vrecord -e, or the cli will prompt you.) We've made some changes that we're hoping will lessen the conflict between qcli and ffmpeg 4.0.

savcampbell commented on May 9

Hi @aeschweik! After reinstalling and selecting the option for creating a QCTools XML after the transfer, I am happy to say that I am no longer having issues with pts_discontinuity and buffer_overrun. Captures are going smoothly! However, even with that option selected it appears that currently a QCTools XML is not being created at all post-recording.

aeschweik commented on May 9

Thank you for testing! #321 should fix this problem.
Perspectives: Annie Schweikert
How testing and feedback make vrecord better

- “vrecord is broken”
  - Logging and error reporting features make finding problems easier
  - Include the terminal output when you’re reporting an issue!
- “Is vrecord supposed to work like this?”
  - Maybe!
- “vrecord could be better”
  - Sure!
Positive feedback loop

- Automating quality control feedback in vrecord
  - When is it my setup’s fault? When is it vrecord’s fault?
  - Making vrecord’s feedback clearer can be a great contribution
- The more QC we add to vrecord, the more we will know when something is wrong, and the more we can send feedback to GitHub
- Keep your logs!
Perspectives: Libby Savage Hopfauf
Using and Training: GUI

- GUI makes vrecord more accessible and intuitive for archivists with varying levels of coding experience.
Using and Training: Passthrough Mode

- **Visual + Numerical** view allows for intuitive level correction prior to capture
Using Logs

computer_name: mac2.local
user_name: mac2
operating_system_version: Darwin Kernel Version 15.6.0: Mon Jan  9 23:07:29 PST 2017; root:xnu-3248.60.11.2.1-1/RELEASE_X86_64
datetime_start: 2017-11-17T14:30:55
video_bit_depth: 10
codec_name: FFV1 version 3
container: Matroska
television_standard: NTSC
video_input: SDI
audio_input: Analog
frammmd5_choice: Yes
audio_mapping_choice: 2 Stereo Tracks (Channels 1 & 2 -> 1st Track Stereo, Channels 3 & 4 -> 2nd Track Stereo)
qctoolxml_choice: Yes
file_path: /Users/mac2/Desktop/UWSC/PHColl_2016-080_T08A/PHColl_2016-080_T08A.mkv
technician: hopfaul
datetime_end: 2017-11-17T14:31:52
Peak Volume is (dB): -6.93721
pts_discontinuity: none
Testing and Feedback: Unfiltered View

- Unfiltered vs. Visual + Numerical
- Buffer overruns
- PTS Discontinuities
Perspectives: Andrew Weaver
First Github pull request: Apologetic and confused

Hi, hope I am using the GitHub interface correctly!
Since we have a bunch of PAL here at the UW, I worked a bit on this to add options for PAL capture. Thought I would send them along!

I BROKE IT!!!

Added options for PAL capture
#2 by privatezero was merged on Sep 29, 2015 • Review required

Fixed PAL options on passthrough
#3 by privatezero was merged on Oct 2, 2015 • Review required
Audio help issues from the community

iamdamosuzuki commented on Nov 7, 2017
The following Audio Channel Mappings are currently available:

- Undeclared
- 2 Stereo Tracks (Channels 1 & 2 -> 1st Track Stereo, Channels 3 & 4 -> 2nd Track Stereo)
- 1 Stereo Track (From Channels 1 & 2)
- 1 Stereo Track (From Channels 3 & 4)
- Channel 1 -> 1st Track Mono, Channel 2 -> 2nd Track Mono
- Channel 2 -> 1st Track Mono, Channel 1 -> 2nd Track Mono

I would like to request the addition of the following Mappings:

- 1 Mono Track (From Channel 1)
- 1 Mono Track (From Channel 2)

filmare commented on Feb 1, 2016
Would it be possible to add audio monitoring to Vrecord using waveforms or levels or spectrograms? Thanks,
Hannah

dericco commented on Oct 17, 2016
The use case is for when a DPS-575AV has Umatic audio wired to audio input 1/2 and VHS audio wired to audio input 3/4. If Vrecord can simply map only 3/4 to a stereo first track then we can avoid the need for a hardware based audio switcher.
Additions and Inspiration
Additions and Inspiration

![AudioRecorder2](image)
Recent Github pull request: Still breaking stuff - it's ok!

ablwr requested changes on Aug 29

- `<div class="hiding">
  
  + <h3>Codec Defaults</h3>
  
  + <p>Unless specified, FFmpeg will automatically set codec choices</p>
  
  + <p>When creating or transcoding files with FFmpeg, it is important</p>

ablwr on Aug 29  Member

- needs a closing p tag!

fix tag/add link
Pull Request Demonstration!

https://github.com/amiaopensource/vrecord
Thanks to:

The vrecord team:

- Dave Rice, for creating vrecord, maintaining it, and constantly making it better
- All developers, issue submitters, commenters, users, and typo fixers!

All information and images in this presentation come from the vrecord documentation or from the panelists.
Links

- vrecord documentation and code: https://github.com/amiaopensource/vrecord
- vrecord contribution guide: https://github.com/amiaopensource/vrecord/blob/master/CONTRIBUTING.md
- How to make a pull request: https://www.thinkful.com/learn/github-pull-request-tutorial/#Finding-a-Project-to-Contribute-to
- GitHub contribution guide: https://guides.github.com/activities/contributing-to-open-source/
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