

RAW Processing Questions

Our company specializes in surface imaging of the human body to track skin conditions and treatment over time. It is extremely important for us to have high-quality and consistent (repeatable) image capture to be used for analysis and measurement.

Prior to ProRAW, we have been using Bayer RAW and CIRAWFilterImpl and associated filters to optimize our images for our use. We have a controlled lighting environment used for the capture process and custom capture using AVFoundation and manual settings.

With ProRAW we are struggling to get consistent output from the CIRawFilter introduced at WWDC21.

We understand that ProRAW offers automatic demosaicing and noise reduction, 14 stops of dynamic range, and that there are computational adjustments along with fusion that may be used to optimize the image.

For us, focusing on dermoscopy, with a close up on a skin lesion, such as the example below. We are not sure that the automated decisions made using ProRAW on this type of image will suit us best. We are seeing inconsistency from capture to capture.



As you can see from the image, we are capturing a rather bland scene. We apply basic color correction to the image to tune it to our needs and aim to have a sharp (but not over sharpened image) with little to no noise and plenty of fine detail. We are always capturing at native ISO of the specific Iphone or Ipad we're using.

With an image such as the above example, can we expect ProRAW to factor in the black perimeter during computational adjustments?

Does ProRAW offer us an any type of advantage for the above type of image?

We experienced consistency with the older CIRAWFilterImpl filter chain when converting image data into our core image filter chain. We have noticed that the new CIRAWFilter filter does not have a one-to-one mapping to it.

For example:

Settings that dealt with noise reduction specifically in CIRAWFilterImpl for use in CIRAWFilter, such as:

noiseReductionContrastAmount -> contrastAmount
noiseReductionSharpnessAmount -> sharpnessAmount
noiseReductionDetailAmount -> detailAmount as well

have been split out – in fact, there does not seem to be any noise reduction filters at all with the new CIRAWFilter. Can you explain why that is the case?

Perhaps unrelated to RAW, and more with image consistency and automatic computational image adjustments:

With regard to AVFoundation and our capture session, does photoQualityPrioritization and maxPhotoQualityPrioritization effect consistency for image capture in both Bayer RAW and ProRAW formats?

For example, this is in the documentation:

“When using AVCapturePhotoOutput to capture photos, the photoQualityPrioritization property of AVCapturePhotoSettings defaults to AVCapturePhotoOutput.QualityPrioritization.balanced, which allows photo capture to temporarily override the capture device’s exposure duration and ISO if the scene is dark enough to require multi-image fusion to improve quality. To ensure that the system honors the device exposure duration and ISO values while in

`AVCaptureDevice.ExposureMode.custom` or `AVCaptureDevice.ExposureMode.locked` mode, you must photo quality prioritization to `AVCapturePhotoOutput.QualityPrioritization.speed`."

How can we ensure there are no automatic image adjustments?

To achieve a naturally sharp looking image should we be looking at unsharp mask or luminance sharpening on top of what sharpening settings we apply for raw?

If you recommend overriding DNG tags, (as mentioned in the WWDC 21 video – “Capture and Process ProRAW Raw images”) in what function call(s) is this done?

Are there specific DNG tags that need to be overridden to stay true to the original capture?