Jon Fauer, ASC www.fdtimes.com Sept 2025 Issue 132

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Art, Technique and Technology in Motion Picture Production Worldwide

Matthew Celia on Blackmagic URSA Cine Immersive

Matthew Celia was a theater kid in high school, growing up in Hanover, NH. He surprised most of his family and friends in senior year by saying he wanted to make movies and become a director. He graduated from Chapman University in Orange County, CA and founded Light Sail VR with Robert Watts in 2015. Their credits include SNL 50th Anniversary Special, Shawn Mendes: Red Rocks Live in VR, *and more than 200 projects in immersive documentary, narrative and music genres.*

Jon: How did you get into immersive filmmaking?

Matt: I've always been a technical person. I was into editing and computers, but also filmmaking, theater and acting. Immersive filmmaking is the perfect blend of everything I'm interested in.

Do you own your own equipment?

We do own a lot of equipment. We still rent a fair amount. We recently bought the Blackmagic URSA Cine Immersive camera. I'm very impressed. Blackmagic is doing some very interesting things that are going to take a lot of the technological hurdles away, and that's going to keep people in the creative lane.

Previously, when shooting with immersive cameras, it was often pretty complicated going from capture to edit to post to headset. There could be seven or eight steps in your post-production flow. Apple and Blackmagic have worked together to condense that into one tool and four steps. It's capture, edit, post, deliver. That's just like working in a regular digital workflow.

Take us through the steps from camera to headset.

The camera is filming with dual fish-eye lenses in stereoscopic 3D, with approximately a 210 degree field of view. The two sensors in the Blackmagic URSA Cine Immersive camera are matched, calibrated and synchronized as they are capturing left eye and right eye. Each eye is 8K. That is very important because it comes down to a little-known thing called pixels per degree. That's very important. It's why your MacBook Pro screen looks better than some other laptop screen because it's packing in more pixels in the same area. The same resolution has a higher number of pixels per degree of view angle. So, if you have a lens that's shooting 210 degrees and your sensor is only 4K and you do the math, you're stretching those pixels over more degrees and therefore it's fuzzier. By having an 8K sensor for that same 210 degree field of view, you get a denser image and that density translates into sharpness. Sharpness in VR translates into reality.

With the Apple Vision Pro headset, when you move your head, the image "look around" is 180 degrees horizontal and vertical. This means that those pixels appear very large in front of us, so treating them carefully throughout the post production process is vital to make audiences feel like they are there. By owning the pipeline from sensor through delivery, Blackmagic has pulled off something really special.

Which maybe is the opposite of a trend that many cinematographers are exploring in a number of feature films and series. So that trend will change?

That blurriness trend in traditional filmmaking I think is a style that further separates the artistic intention of flat films as opposed to immersive films which are giving audiences a more realistic sense of being present in the narrative. I think immersive is starting to define it's own rules as a medium and that's a very good thing. 180 degrees is a very wide canvas.

If the Blackmagic URSA Cine Immersive lenses have a 210-degree angle of view, how is it cropped down to 180 degrees?

It's a good question. Fish eye lenses degrade the image quality at the edges pretty significantly. By making a lens that's 210 degrees, you can cut out the poor image quality sections to keep the quality in the 180 space. It's a smart engineering decision that tells me the team is very focused on quality.

How do you compose with this camera?

You're seeing the 180 degree image and there are frame lines and guides showing you the hero point of view, as if you were looking straight ahead in your headset and not moving your head at all. Since we're looking at a fisheye, these guides help us relate to where viewers might need to be looking to see our shot. However, a lot of what I do is stand and look with my own two eyes and see if it's an interesting place to be.

What are your preferred recording settings?

It records Blackmagic RAW, embedding the lens calibration metadata in every file. The recommend Constant Bitrate is 12:1. Even at 12:1, your file sizes are large. An 8TB media module gives

you about an hour and a half of recording time. Bumping up to 8:1 or 5:1 probably wouldn't give us much difference because our pixel density due to the fisheye lenses is already so much lower than most cinema cameras. But if you are using the camera for VFX plates, maybe there is a reason to go that high.

How do you compose and capture? Monitors or headsets?

At Light Sail VR, we've built our own live headset preview system while we wait for an official solution to come out. This is usually my number one requested feature! A lot of people may just look at the monitor, but then you see a fisheye image. The problem is that a fisheye image has all the wrong proportions and you're missing the experience of looking at how the finished deliverable will look in a headset.

Being able to look with your head is the end goal. That's what people are going to actually experience. I'm a big fan of on-set headsets. We have them available because helps our clients and it helps directors new to this medium close that knowledge deficit. Placement of the camera is very important. You can't zoom; the camera has fixed lenses. With headset preview, you get a one-to-one translation with the camera. And the whole system is designed to mimic human visual acuity.

I like to think about the composition as where's the most interesting place to stand. When blocking, I'm trying to build dioramas in a way. I'm inspired by Wes Anderson's blocking because I think he'd be a great immersive filmmaker. He has that world of dioramas and symmetrical compositions. And that works well in this medium.

It goes back to my theater roots in Hanover, NH, understanding how attention is given on stage, how you're building a world where audiences choose where to look. Immersive is very theatrical. We're playing on a 180 degree "stage," with a canvas that has depth because this is stereoscopic 3D. We have the Z plane to work with. Characters move in and out of depth. We place things in various layers. We can create frames within frames with blocking, art direction and set design that can help ground an audience in the narrative so that they know what to look at.

With such a wide angle, how do you keep lights out of the shot?

Lighting is hard, and we do a lot of visual effects work to remove lights in the frame. It's extraordinarily hard to light your project cinematically and not see any lights, so careful planning is critical to deliver cinematic work.

We capture clean plates to effectively paint the lights and other equipment out. Remember, not only are you often seeing the lights in frame, but you're seeing the ceiling, the rigging, the floor, the dolly track, or anything directly below you. We even use a 24-inch dovetail to put the camera out over the tripod legs so that the camera sits all the way out front and doesn't see the legs. We have a great VFX team at Light Sail VR and Resolve's deep integration with Fusion makes this process so much easier than in the past.

Authenticity is important in this medium because cheating is extraordinarily difficult and expensive. The camera shoots at a native frame rate of 90 fps. And Apple Vision Pro plays back at 90 fps.

Truth at 90 frames per second. Tell us about post.

We're a full DaVinci Resolve shop at Light Sail VR. It has been a game-changing tool for us because of the stability, the collaboration features, and how good it is at handling high frame rate, high resolution footage with really accurate color science. What's great about the new release of DaVinci Resolve when working with footage from this camera is how you have all of these tools natively integrated that previously required hacky workarounds. There is now an immersive viewer where you can punch in and see the viewport. You have the ability to work in stereoscopic 3D and have all the effects matched per eye. You can work on visual effects per eye without having to prepare individual plates. Huge time savings.

Are you using headsets when editing?

We have direct headset support streaming from DaVinci Resolve to a visionOS headset so we can see the work live in the editor. It's a wireless connection. No more waiting hours for an export just to check if your title is displaying correctly in 3D space. I find it's really helpful for understanding the geometry of the edit and also for nailing the color correction, since it supports HDR.

In conclusion?

Matt: It's a very exciting time to be working in this emerging medium. The storytelling techniques are getting better. The tools are getting better. I think we're going to see a lot of incredible content come our way this next year and beyond and myself along with the team at Light Sail VR are going to be a big part of that.