

Leora Kornfeld ([00:09](#)):

Welcome to Now & Next, a podcast about innovation in the media and entertainment industries. I'm Leora Kornfeld. On this episode, we're going deep into the world of virtual production. And your first question probably is, what does that mean? Well, in a broad sense, it means special effects become the primary tool in the filmmaker's toolkit. So, one way to think of it is this, it's a shift away from bringing all of the elements of a live action set together in one place like actors and crews, props, locations, all that stuff, and toward an approach that instead builds big chunks of the production together, digitally. This means that people in stories can be placed in environments they're not actually in, or that don't really exist. Kind of like the world of video games or VR, you may be thinking. As it turns out, yes. And the tools that make it possible are video game engines like Unity and the Unreal Engine

A-Thomas Goldberg ([01:15](#)):

It's developed by Epic games, 20 some odd years ago in its earliest incarnations. And in the past few years, the visual fidelity and the visual capabilities begin to match that of sort of traditional visual effects for film.

Leora Kornfeld ([01:32](#)):

That's Athomas Goldberg. He's the executive director of Shocap Entertainment in Vancouver. And he's been involved in computer graphics, animation and the interactive industry for over 25 years.

A-Thomas Goldberg ([01:44](#)):

And as the Unreal Engine has kind of gotten closer and closer to being able to create sort of cinematic, truly cinematic, visual effects and cinematic images, there's this obvious interest in adapting those techniques to the actual production of cinematic images for film. With something like the Unreal Engine, we're finally at that point where we can create images in real time that don't immediately Telegraph their sort of their digital-ness. And so, whether that's creating sort of fantastic creatures or whether that is interactive experiences, it's about creating sort of digital characters and giving either authors or performers, the tools to create characters and bring those characters to life in a kind of a real-time interactive context.

Leora Kornfeld ([02:34](#)):

That's the view from the game/interactive world. Now, let's get ready to hear from two people merging that world with the film world. Andrew Scholotuik and his production partner, Dylan Pearce are based in Edmonton. They've been working together for about a decade, mostly figuring out how to do things that haven't been done before and doing them on indie budgets. Most recently their projects have added virtual production techniques to their toolkit. And they've had quite a bit of success doing things this way with projects that have made their way onto Amazon, Lifetime and Hallmark and some big screens too. And now, my conversation with Andrew and Dylan.

Leora Kornfeld ([03:24](#)):

So, you two have done, I think, it's eight feature films together, and you've got lots of experience building custom, shooting systems or rigs that really push the edges of technologies that are available. I'd like to start out by having you describe in lay person's terms, if you can, your current system for virtual production and how it works. Andrew, do you want to start?

Andrew Scholotiuk ([03:45](#)):

So, I'll begin by saying that I think the virtual production is a very wide umbrella for a number of different techniques, technologies that all essentially surround the concept of live rendering, live visualization in real time for film production. Right now we have built a studio about 2,500 square feet utilizing mo-cap stage.

Leora Kornfeld ([04:13](#)):

Okay. Now what's that? That's, mo-cap, is motion capture, I'm guessing?

Andrew Scholotiuk ([04:16](#)):

Motion capture, that's right. So, within the sort of motion capture there's motion capture, which is mostly known for tennis balls on a performer and that's capturing the skeleton. And then, there's performance capture, which is essentially capturing the facial and emotional capture of the performance as well. And that is typically seen in pictures with a camera mounted to a headset, and sometimes you'll see dots on the performers faces and that's helping track data. So, big goal with virtual production is how do you digitize and mix the real world and the virtual world? And there's lots of different ways of doing that. And there's lots of different areas where you can end up. You can be completely in a virtual world or a hybrid to everything from more of a, let's call it a bit of a mixed reality, with utilizing video walls and, and camera tracking as well. So, right now, to kind of get back to the question, is we're operating within a motion capture volume, which is rendering that into a virtual world, right now. So...

Leora Kornfeld ([05:27](#)):

And how is this different from AR and VR, which more of us are familiar with. Because what you've just described there is pretty new to a lot of people, unless you're maybe in the game world or something, this stuff is pretty new. So, how is it different from AR and VR?

Andrew Scholotiuk ([05:41](#)):

It's just about the tools and technology and workflow that suits the needs of the production. Mandalorian is a perfect example. They created a solution that was quite specific to their needs, while very universal. Their particular challenge was they had a Chrome lead actor with tremendous amounts of reflection. So, that needed to be done in real time. However, there were certain opportunities where they found utilizing traditional green screen instead of the video wall was much better. So, I think the new technologies and methodologies of virtual production allow a lot more collaboration, where multiple artists can work together in real time from remote locations to create incredible stories and environments. Might be a bit esoteric, but Dylan, maybe you could help me out there.

Dylan Pearce ([06:34](#)):

Well, one of the, I mean, one of the biggest things, you can do VR and AR in a utilizing game engine technology, virtual production is kind of combining the film world with the game world. Which, in any one of those disciplines, AR or VR, that can be there as well. It's kind of we're not trying to shoot a 360 environment or a 180 environment. We're still utilizing traditional film techniques that are used on any set. It's just kind of fused with a game engine technology. Right now, the game world is trying to bring as much possible to the front, the live side. Whereas, film fundamentally is always on the effects side, that's been pushed into the post production. And so, virtual production is kind of allowing both of those worlds to meet up at the very front of the process rather than as so much on the backend.

Leora Kornfeld ([07:35](#)):

So, much for that old, we'll fix it in post. I remember feeling that a lot. Yeah. So, that's over?

Dylan Pearce ([07:41](#)):

I wouldn't say it's over. There still is a tremendous amount of work that goes into the post side. But for, as an example, the creative freedom and allows for a director of photography to hold sunset lighting for as long as they want for actors to creatively understand what they're seeing rather than a green screen, everyone can react dynamically in the right moment to what's happening because they can visually see it or experience it. So, it's much more collaborative in nature.

Andrew Scholotiuk ([08:13](#)):

Yeah. Just to build on that. I think one fantastic opportunity that we've seen so far is when you get into post, as fast as the computers are in rendering and systems, there is typically you're measuring changes within days, sometimes weeks before you see a narrative changes happening. And even on an unlimited budget, that does affect you on your choice. You're always measuring against time and is it worth another path. When you can create and everyone on your team can see it live, it engages a different part of the brain. It's much like being on set and you do your second take and then, prop C something in the background, you make a small little tweak. You're always improving. You're always empowered to make that change when it comes up.

Andrew Scholotiuk ([09:02](#)):

And to have everybody in that mode, everyone can agree. All departments, technical and non, to see the output, the impact of what these choices are in real time. When everyone can see it on the screen, anyone on set can ask a question, "Hey, is that look right? Are you sure we want to do it this way?" So, I think it really empowers and engages the team and that little kind of creative juices.

Leora Kornfeld ([09:25](#)):

And you mentioned the Mandalorian, and we do tend to associate this type of production with Hollywood movies, with the budgets and the hundreds of millions that come out of Disney or Lucas Film or Pixar or whatever. And we all know that now, just any type of production is more complicated and more expensive because of COVID-19 restrictions. So, to what extent would you say that that taking this route of a virtual production helps in that way? Does it help?

Andrew Scholotiuk ([09:54](#)):

Technology still costs. It's not a fix-all. There is an incredible learning curve with these new tools. Like any other film, you would encourage people to go and collaborate and partner up so that you're not learning it from scratch. This is, at the moment the recent technology shift has kind of moved it from \$10 million to a million or less, but it's still, it still requires quite a high capital investment. Like all the technology that we've seen, it's become another tool in the belt.

Andrew Scholotiuk ([10:25](#)):

One example, I kind of think about about how this could be used in a very practical way on set is, let's say we're shooting in an apartment building and we need to key out a window. You could take a 70 inch plasma, LCD screen outside that window, track your camera using camera trackers, render in live real time the perspective that that window would have to the outside world, be it New York or the desert or

wherever. And that, in a very small little case study, is how this technology could be used in a traditional film sense.

Andrew Scholotiuk ([11:03](#)):

On the other side, within virtual production, we've been working with a team out of the States where it's a theater that wants to find new ways of engaging with their audience. So, they're trying to find ways of collaborating with artists and their audience remotely. Utilizing virtual production, it can facilitate digitize performers and their performances into a virtual world and present that in unique ways. Maybe we place them in virtual space on that very stage or elsewhere around the building.

Andrew Scholotiuk ([11:39](#)):

So, within virtual production, there's two very dynamic ways of utilizing this. So, I don't think this is about, will it be right for everyone? No. But the fact that once you start working in the virtual world, everything can be connected basically through an IP address, through a network connection. And if you can hop onto a network, we can now connect workstations around the world computers as if they were close by. And that allows for if your tool is a computer and you have interfaces to allow you to work on that computer, you can now work remotely in real time together. So, I think that opportunity as well is what's really exciting, particularly in the times we're living in right now.

Leora Kornfeld ([12:24](#)):

Yeah. When we're all spending, I think it's, I think 95% of our bodies are Purell right now, and 95% of our lives are spent on Zoom. So, do you see more people experimenting with it now because of the COVID restrictions? And if so, do you think it's kind of like a for now, stop gap measure? Or do you think it's something that could be more of a permanent shift in the way people are approaching production?

Dylan Pearce ([12:50](#)):

Definitely will be a permanent shift. I think right now, there's, for most people, they see it and they're either really excited by it or terrified of it because of the unknowns, the cost, the complexity of it. But, there's also an indie way to do this. There are backdoors into utilizing virtual production with a simple green screen and a HTC Vive tracker system where you can pretty much track and do everything that they're doing on the big budget shows just in a kind of an Indie way. So, I think it'll be a lot of the willpower of indie creators to push this. But, on the COVID side, the idea that you could go to one place, you could have a little mini studio anywhere rather than the big studios that are out there. So, I think a lot more indie productions once they get their heads around the tech will start to utilize this technology to help their films.

Leora Kornfeld ([13:48](#)):

What are some examples of the type of, not just work arounds, but credible work arounds that you can do now using virtual production techniques?

Andrew Scholotiuk ([14:00](#)):

One of the biggest challenges with, let's see, any project that needs to be shot on green screen, let's just start at sort of a digestible sort of case study. Anything where we're placing actors in an environment that's either not safe, or that is out of this world. When it comes to lighting, lighting a subject on green screen is very difficult. It typically results in the look you would see in Lord of the Rings, which is always

backlit, and that's designed to help reduce and improve the lighting that happens on a green screen. Now, your key to source, your background, is let's say a video wall. It is, a lot of these are quite, quite bright, are actually illuminating your foreground or your actor. They're illuminating your subjects. So, as your background is shifting, skin tone, reflections, quality, and tone of light change with it.

Andrew Scholotiuk ([14:52](#)):

So, that also creates a much more realistic situation. Things like reflections on a car windshield, glasses, while these can be added in post, our eyes are fairly well trained to pick out composite elements like that. We've been doing some work with a game company to help share information technology and resources, and one little anecdote off the top that kind of made a lot of sense to me is that when you're creating an entire world from scratch, you can create vast scapes of mountain or people or battle scene. What's really difficult are the very subtle natural unpredictabilities of human movement. So, for example, you might be able to create a really lifelike character, but getting it to blink appropriately where it doesn't feel weird. It can take a long, long, long time to script something that feels natural.

Andrew Scholotiuk ([15:52](#)):

I think that the, because we spend, our brains are constantly trying to analyze what's, if there's something wrong with a scene. There's a number of subtleties that can really stand out. Lips and teeth, with any kind of digital character, are the first things that are a tell. Skin has is usually very, very difficult to calculate how it receives light, sheen, things like that. So, I think the human face is still incredibly difficult to go. I think we're going to see some, there's some very convincing virtual humans out there, but it's still a bit, we're still years away from not being able to know. That uncanny valley is wide.

Leora Kornfeld ([16:41](#)):

Ah, yes. That uncanny valley. You may not be familiar with the term, but I bet you know it, when you see it. Let's go back to A-Thomas Goldberg from Shocap Entertainment for a more detailed explanation.

A-Thomas Goldberg ([16:54](#)):

The uncanny valley is a term that refers to the phenomenon by which when a character, the more a character becomes visually photorealistic. The more that a character looks like a sort of real human being, the more sensitive we are to how well that character's behavior matches our expectations from a real human being. And when those expectations are kind of mismatched, when a character looks like a completely photo-realistic human being, but their behavior doesn't quite reach that, we're left with this very sort of disturbing feeling. That's the essence of the uncanny valley. It just, it becomes creepier and creepier because part of our brain is telling me this is a real person, but the other part of your brain is telling you, why are they acting so robotic and strange? We're trying to use the language of animation and the range of possibilities in animation, that ranges everywhere from hyper-realistic to extremely stylized and kind of everywhere in between, we're really kind of looking to find that balance of a style that will enable us to create believable behavior without sort of falling into the valley.

Leora Kornfeld ([18:10](#)):

So, for both of you, Andrew, you're more on the production side and Dylan on the direction side. I'm curious to hear from each of you, the skills that people and production companies need to move in this direction, what would you say those are?

Andrew Scholotiuk ([18:25](#)):

The main thing that's required would just be openness. And seeing that this, within new technology, particularly with virtual production, it's going to allow, I think for new partnerships, new ways of working. Either within a region or being able to connect and produce and create without boundary. Where we find ourselves right now, for Dylan and I, it started with someone introducing us over coffee to a game developer. And we spoke for close to a year just over what could happen. So, I think that openness and being able to search for new opportunities where traditional production has sort of restricted us in that way.

Andrew Scholotiuk ([19:10](#)):

On a more practical sense, though, I think within the technology like this, there's sort of always two paths that technology can go, it can go into a black box where it becomes very proprietary and it's packaged and then it's just upsold and you don't have to buy your way into it. Unreal and virtual production, I see taking a very, very open, very collaborative. There's a tremendous amount of creators online, either through Facebook groups or forums that are sharing this information on a daily basis about what they're learning and you can stand on their shoulders. So, I think going out, watching YouTube clips, getting onto the forums and just, even if you're not going to have a virtual production around the corner, just understanding terminology, what's possible, is going to start, I think, lighting up different parts of the brain and starting to sort of shift that perspective about what is possible. And I think the power of this isn't just about transposing what we did in the past into this new technology, but what can we do with this new technology that we've never done before?

Dylan Pearce ([20:12](#)):

I know a lot of people who have been really excited by the idea of virtual production and then try to jump in and it can feel so daunting. So, I think that the biggest practical things filmmakers can do at this point, is just is one having patience with themselves. Learn and practice. You can, if you don't have the budget to just go out and hire the techs that you need, there is an immense amount of resources online, not just through YouTube videos, but as Andy was saying with Unreal, and that's just the platform that we're utilizing right now. But Unreal gave out grants just to learn the program for filmmakers.

Dylan Pearce ([20:56](#)):

There's so much opportunity out there and looking at the tools that you can utilize yourself. If you have a iPhone or a camera that utilizes face capture technology, you can start to play with the creating your own face capture, digital avatar. You don't need one, all the fancy tools or two, any of the expensive programs. You can open up Unreal, use your phone. It's one, I won't get into the complicated part, but it's literally one little blueprint nod you add. So, one thing to connect your phone to that, and then you can start to digitally move around a character's face in real time. There was just announced, there's an app that utilizes your phone to fully mo-cap somebody. Now, this might not be Hollywood level grade, but it's wonderful foundation to kind of learn the platform and just start to get familiar with it so that when you do have a production, you understand it and you can put your money in the right places for it. I think that's the first step.

Andrew Scholotiuk ([22:00](#)):

Sometimes I think there's a little trepidation about from artists, particularly filmmakers. I remember when HD was coming out, everyone was like, "Wow. How do I make money? How is this going to be, how is this going to cover its costs?" And I think there's a sort of like, "Well, what's in it for me?" When

we started, we explored 3D, Dylan was picking up all sorts of small little handy-cams with dual lenses. And we played with it for a good two years before, then from there, we custom built our own 3D rig, using 4k and a beam splitter and hired one of the world's leading IMAX geographers. We didn't start there, but it took play. And I think while the filmmaking process is so refined and it hasn't really changed while technology has, it can kind of create a bit of complacency. And I say, I think so to view this as a sort of challenge to go poke and prod and ensure that we're pushing it forward, we're not just waiting for it to happen, I think is important as artists.

Leora Kornfeld ([23:03](#)):

There's something to be said for that willingness, like you say, to play, to experiment and also to fail, right?

Andrew Scholotiuk ([23:10](#)):

100%. the number of failures that we've been through it, and it's without hyperbole, we've learned way more from our failures. Dylan and I just having worked together for what at least 10 years and how many films and countless shorts and things like that. We find the technology, it can be exciting. It sort of allows us to explore the process in new ways, it's a new challenge. I find myself, when I'm on a steep learning curve, that's when my brain is more actively engaged. I find when I start doing, get into repetitive, we start doing a film similar to the last one, you start sliding a little bit back in your chair. And this sort of, with this technology, I feel I'm back in the deep end, like I'm way underwater. But it's very engaging. You bring your full self to the project, at least when I'm in that mode.

Andrew Scholotiuk ([24:03](#)):

The other thing that this allows is that, we come from very humble beginnings and still very modest budgets, a lot of self-funded. As an independent Canadian producer, you're thinking, how do you separate yourself? How do you hit above your weight? And I think technology can, in certain cases, because there's always a bit of confusion that surrounds technology, there are always opportunities to enter and to re-establish, or to identify yourself in unique ways. In such a saturated market, we're not only having to think of as artists and creators, but also a bit of self-marketing or things like that. So, in technology, there can be seismic shifts in power, in decision-making, in process. And I'm not sure if this is one of those situations, but it's always kind of interesting to keep an ear to the rail for those types of seismic shifts as well.

Leora Kornfeld ([25:03](#)):

Okay. Well, thanks to both of you for your time and for schooling us. There's a lot, there's so much to know and understand. And like you say, just get a different perspective on with this stuff. Thank you very much. Andrew Scholotiuk and Dylan Pearce.

Andrew Scholotiuk ([25:20](#)):

Thank you so much. Appreciate it.

Dylan Pearce ([25:20](#)):

Thank you for having us.

Leora Kornfeld ([25:23](#)):

And that's it for this episode of Now & Next, a podcast produced by the Canada Media Fund. If you're interested in a transcript of this episode, or show notes with some additional information and links, just head to the CMF trends website. Also, one of those friendly little reminders about subscribing to the podcast, if you haven't already done so. And if you can, take a few moments to rate and review the show, both are a really big help in getting the word out. So, thanks for that. That's it for now. I'm Leora Kornfeld, and I will see you next time.