

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

### Paul Salvini, CTO, Christie Digital delivered this keynote at the Projection Summit

*What does the future hold for Pro AV integrators? Dr. Salvini discusses near- and long-term factors that may influence future innovation opportunities, as well as review key influencing factors that could help shape the direction and value proposition of the Pro AV market.*



...Today I want to talk about some of the high level trends that are likely to shape our industry in the years to come.

In my talk I'm going to cover the highlights of what Christie is working on.

By the end, I hope you'll see that I characterize our collective future as one that is **bigger, brighter, faster, sharper, and smarter**

.

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

I couldn't be more excited about what's happening in the pro AV market as there are so many emerging opportunities for our companies to collectively tackle.

### High Brightness

My first slide is on higher brightness.

You don't need to work very long in this industry before you get a phone call from someone looking for us to defy the laws of physics.

Perhaps the request is for daytime projection mapping on a building. Or, even more extreme, the desire to project on the surface of the moon.

Some of you might have seen this rolling rock ad from a few years ago. They ran a fantastic campaign that convinced a lot of people that moon-vertising was actually on the way.

If only we could deliver!

But while lighting up the moon might be a bit out of our reach, projectors are moving outdoors and the art of projection mapping is starting to explode.

### Projection Mapping

Projection mapping allows artists to turn virtually any surface -- including existing architecture -- into giant canvasses.

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

Christie continues to invest heavily in the development of tools to make it faster and easier to light up virtually any surface through projection.

In this image, we see Moscow State University turned into one of the world's largest visual displays by Alfa-bank, Russia's largest private bank. This spectacle was done in celebration of Moscow City Day with an audience of 800,000.

A total of 81 Roadie and Roadster projectors were used to deliver almost 2 million lumens of light onto 275,000 square feet of building surface in three dimensions.

Finally the world is your canvas.

And projection mapping, while stunning in its largest form, is also growing in popularity at smaller events and local venues -- both outdoor and indoors.

We're seeing a growing number of deployments in corporate applications, in hotels, and in architectural design.

There's a lot of expertise that goes into the planning, development and execution of these events. And like everything we do, it requires great content in order to deliver a great end result.

It's encouraging to see how the market has creatively taken displays to places they've never been before. We continue to see more projectors mounted on moving vehicles and even projectors mounted on moving yokes tracking moving objects.

And as personal displays explode in popularity, we have seen a number of uses of public displays that incorporate data and imagery from personal devices onto a large shared public canvas.

## **What's Next for Pro AV?**

Written by Paul Salvini  
27. 06. 2012

---

So the concept of the public display is still very much a cornerstone of our industry and one where we anticipate continued growth.

### **Laser Projection**

One of the topics of the day in the projection world is laser projection. After all, it's been the "next big thing" in projection for the last 20 years.

I suspect the impact on Pro AV is still a ways down the road, but at least the road is now paved and has some directional signs up.

Our first session this morning, in fact, is dedicated to lasers and hopefully will cover both the pros and cons of this emerging technology.

Laser projection has a number of potential benefits -- high brightness, long life, near constant light output, no lamps, higher contrast, and more.

Christie has been working on advancing laser projection technology for many years and our laser program represents the largest R&D undertaking in our company's history.

We have on staff some of the best laser engineers in the business and our sister company, Necsel, is a world leader in laser technology.

We proud to be a founding member of the laser illuminated projector association (LIPA) - who will be presenting in our next session.

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

Despite all that activity, as a company we have been somewhat reluctant to hype laser projection because we still think it's a little early.

Nonetheless, with all the marketing messaging happening around laser projection recently, we do feel it's important to share some thoughts.

Last month we made our first public announcement on lasers with a fairly significant technology demonstration. We invited some of the titans of film up to our Canadian office for the world's first high frame rate laser demo.

Our guests included Doug Trumbull -- the father of high frame rate cinema, Demetri Portelli -- the award winning stereographer on Hugo, and Ian Bidgood -- technical guru from Peter Jackson's Park Road Post in New Zealand.

We had a great day -- screened a lot of 2D and 3D content - and had long discussions on future technologies for content creators.

But as prepared as we are with laser projection from a technology point of view, there are still a few key issues that -- in my opinion -- need to be addressed to pave the way for the successful commercialization of laser technology -- and this is true across our industry.

The first is price. Lasers are still expensive and the price of individual lasers needs to come down before we're going to see significant commercial viability.

Today, if you need the brightness of 60,000 lumens, it is still cheaper -- even in terms of total cost of ownership -- to stack two projectors. That's one of the reasons we released our Duo technology -- allowing two projectors to be easily stacked.

The second challenge is regulatory. Lasers are subject to many jurisdictional restrictions from the good old days of high power scanning lasers at rock concerts.

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

Here in the united states, for example, lasers are regulated federally by the food and drug administration and -- in outdoor uses -- by the federal aviation administration. Several other government agencies at the state and local levels also have restrictions that need to be addressed.

One requirement, for example, is the need for vertical separation to ensure that audience members can't look directly into the lens of a laser projector.

One suggested solution is to remove the top few rows of seats. You can imagine how well that would go over. Another idea is to ask patrons to sign waivers before every show. Equally practical.

Now the irony here is that we're not using scanning laser technology like in those good old days of rock concerts. In fact, the way we integrate light makes it no more dangerous than looking into a regular xenon cinema projector.

Of course, maybe that's part of the problem... It's not a good idea to look into the lens of any cinema projector. Anything that can melt clothing is probably worth respecting when it comes to safety.

But that word "laser" is there and consequently, so are those regulations. Some time and effort will be required to work through the necessary exemptions as an industry so we can bring this technology to market.

And that's where we are working so closely with the great team at LIPA and the rest of the industry to get the necessary changes and approvals to roll out laser projection in a practical way.

The third challenge is one of standards. Two big promises of laser technology are higher brightness and higher dynamic range. But we can't simply take existing content and crank up

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

the brightness.

Take the movie industry as an example. Films -- especially 3D films -- are very carefully color graded for today's average cinema light levels. We need to work hand in hand with the content creation industry to build a roadmap with brightness targets for the industry we can achieve together over time.

Content creators need to know what their work is going to look like when seen by the audience -- and for that we need updated industry standards -- especially for 3D.

We'll all get there eventually, but we need to be mindful of these very real challenges.

## High Frame Rate Cinema

For me, the biggest and most exciting change coming in our industry is happening with the move to higher frame rates.

Ask any video gamer which is more important: higher resolution or higher frame rate and they'll probably answer frame rate every time.

Christie has been working closely with the two biggest leaders in the world for high frame rate cinema: James Cameron's Lightstorm Entertainment and Peter Jackson's Park Road Post and Weta Studios.

The first major 3D high frame rate film is scheduled to be released this December... and that's Peter Jackson's *The Hobbit: an unexpected adventure*.

For around 80 years now, cinema has been using a frame rate of 24 frames per second. That

frame rate was chosen at a time when printing physical film was very expensive. It was, in fact, the slowest frame rate that would yield an acceptable audio track.

For decades, directors and cinematographers have had the great challenge of making filmed content look acceptable at 24 frames per second. In other words, they have been forced to work within the constraints of their medium.

High frame rate cinema will allow filmmakers to work at higher frame rates such as 48 and 60 frames per second.

The result will be significant: much more creative freedom for the content creators resulting in a richer storytelling experience. Moreover, there is much more temporal detail resulting in a much more natural looking image.

And while higher frame rates are great for 2D films, they are truly invaluable for 3D films as they result in much less strobing or judder, and a much more satisfying 3D experience.

As the 3D experience improves through the adoption of high frame rate content, you can expect to see more high frame rate 3D content deployed outside of cinema.

To help train the industry, Christie recently announced, in partnership with the Screen Industry Research and Training Centre at Pinewood Studios in Toronto, the creation of a world class laboratory for research and training into high frame rate production.

The laboratory is conducting fundamental research into high frame rate perception, training content creators on how to use high frame rate effectively as a new medium, and driving standards in the industry relating to higher frame rates.

But why is this advance in cinema relevant for ProAV? After all, many of your projectors have supported high frame rate stereo for years.



Of course the answer is access to content and the likelihood that high frame rate content will begin to emerge outside of cinema.

Perhaps the most interesting opportunity is the potential that higher frame rate production has in opening the door to premium alternative content experiences.

For example, many sporting events, where the speed of the action can't be controlled by a director, are very challenging to capture effectively at today's standard broadcast frame rates.

Imagine formula one, the Olympics, world cup soccer. All significantly more compelling at higher frame rates whether in 2D or 3D.

### **Higher Resolution**

Higher resolution technology has been around for a while, but there still isn't much native content available.

The added value of a higher resolution canvas is very much a function of the application. If it's in a business or control room environment, the added pixels might be very welcome.

If you're using that canvas for a single image, however, there are some challenges for content creators if they are to make good use of the added spatial resolution.

A few years ago, in my previous career in film and visual effects, I was involved in creating some of the earliest native 4K digital content.

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

The imagery looked stunning, until the camera moved. A camera move that looked great at 2K, was hard to watch at 4K.

To make those same shots look acceptable at 4K, we had to do one of two things: increase the frame rate, or add a lot of artificial film grain and motion blur until it looked like the 2K image.

So we quickly discovered that 4K -- unless you work at higher frame rates -- was a medium unto itself. It worked best when you included a lot of wide camera shots with the action taking place in a small window within that canvas. Or if you really restrict the speed of motion on screen -- in other words, with very careful compositions.

And that's surprisingly similar to the experience that filmmakers had when working with 3D for the first time.

I expect that 4K will ultimately grow in value as people get more comfortable with content creation. It will also be more attractive as production moves to higher frame rates.



## MicroTiles

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

MicroTiles are a very innovative product from Christie and, as a result, they created a category of their own.

Whether in broadcast sets, rental staging, or in architecture and fixed installations, the flexibility of MicroTiles to be arranged into virtually any shape is very exciting.

For designers, these tiles provide a way to deliver a differentiated experience which is quite an attention getter.

But creative displays can only succeed if we have the tools to allow their easy deployment in the field.

Part of that deployment is the software that allows content to be displayed and updated over time.

To do this for MicroTiles, Christie has created a new product called Jumpstart which is a software solution for managing creatively shaped tiled displays.

I think this speaks well to the direction we're taking with respect to getting closer to the content and growing into more software and solutions.

All of us are in the content display business. Without content, we don't exist.

So when we're pushing the envelope on display technology -- that only makes sense if we have the content and the tools to effectively manage and deliver that content.

A real specialty at Christie has always been in the control and deployment of multi display solutions -- whether it's video walls, blended projectors, projection mapping -- we certainly won't

stop innovating in this area as we see it as a key market for growth for the company.

### LED Projection

Earlier I talked about laser projection and one of the advantages of course is the elimination of lamps.

In some applications, especially where high brightness isn't required, LED projection is finding significant success.

Brightness continues to increase, and customers looking for greener and more sustainable solutions to their projector needs are finding LED projectors particularly attractive.

MicroTiles are a great example of a successful LED based projection platform.

Control rooms provide another environment where lower power solid state projection is desired.

Our latest line of control room projectors are LED based and provide a maintenance free experience for our customers. In times of crisis, control rooms can't afford to have any issues with reliability of displayed images.

Another example where LED is attractive is in visual environments such as with flight simulators. In those applications, it isn't unusual to have a dozen projectors stitched together to create a seamless immersive visual environment.

We will continue to explore ways to improve LED projection technology wherever it makes sense for the application in question.

### --Wireless

Another fairly clear trend is the growing adoption of wireless technologies for both projector control as well as for streaming video.

This is one of those areas where a number of formats will need to battle it out for a while and perhaps that speaks to the need for flexible platforms that can updated over time as standards evolve and possible mature.

Where it makes sense, we expect to see greater support for wireless built into our products in the future.

But of course we want to do this in a way that is open, interoperable, and flexible to support the various standards as they evolve.

With the growth in bring your own device policies now being created in many corporate environments, we see a growing need to ensure our devices can communicate effortlessly and seamlessly.

### **Smarter Projectors**

And I suspect that ties nicely into this slide which is about smarter projectors.

Almost every piece of technology that was once "only hardware" has evolved to become a mix of hardware and software.

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

That's true for cameras, cars, and even phones. If you've bought a TV recently, you've probably noticed that much of the differentiation is now in the software.

One of the major areas of interest for us is in ease of use and user experience design. We've all been in boardrooms and classrooms where figuring out how to the technology has been less than straightforward.

Of course, how smart a projector needs to be is a function of its application. In some cases, we're encouraged to make our projectors as dumb and foolproof as possible.

In others, we see clear needs for highly intelligent projectors that have local rendering capabilities and the ability to communicate with each other.

To satisfy both needs, we need to make sure that the platforms we deliver will be easy to use, yet incredible powerful and flexible.

### Interactivity

My final slide is on interactivity. The consumer world has quickly embraced direct manipulation touch and multi-touch display technology.

In the world of smartphones and tablets, these interfaces are now quite standard.

Our work in adding multi-touch to large format displays is evident in the soon to be released Christie interactivity kit for MicroTiles.

This kit turns a passive display wall into a collaborative, multi user, multi touch surface that is indicative of the capabilities that will be expected of many displays in the future.

## What's Next for Pro AV?

Written by Paul Salvini  
27. 06. 2012

---

So it's reasonable to assume that we will need to continue the work we did on the interactivity kit to ensure that we stay on top of the need for various multi-touch and gesture based interfaces for the years to come.

So there you have it! We have a future that is brighter, faster, crisper, smarter, more connected, more creative, and more interactive than ever before.

And that's a pretty exciting future.

Thank you very much

Go [Paul Salvini, CTO at Christie Digital](#)

Go [Projection Summit 2012](#)