

LF Examiner[®]

First published
February 2018

Giant-Screen Biz Meets Themed Entertainment...and They Get Along Just Fine!

by Paul Fraser

There was a time when the only major media-based experience at most museums or science centers was a film in a giant-screen theater. Today, most museums, including those with GS theaters, have embraced lots of media throughout their buildings. And GS filmmakers, in their quest for revenue to help pay for their productions, and to extend their stories, have re-purposed and licensed their content for a myriad of non-GS theatrical uses.

My visit to the enormous trade show of the **International Association of Amusement Parks and Attractions** in Orlando last November got me thinking about what the GS industry can take away from the latest developments in media-based attractions found in the themed entertainment industry, and about what the GS industry has already learned.

Museums with giant screens have not been standing still. Several have recently added other media experiences, and in my consulting practice I've even heard a few museum CEOs wonder aloud, "What new ideas for media-based attractions could potentially replace our GS theater?"

At least one U.S. museum is poised to do just that. As *LF Examiner* reported last year (see *Shorts, November 2017*), Connecticut's **Maritime Aquarium at Norwalk** is planning to build a 4D theater that would replace its 30-year-old IMAX theater. The IMAX will be razed late this year so that the Connecticut Department of Transportation can replace an old but very active railway bridge next to the building. Although no announcement has yet

been made about which 4D system will be selected, the new facility is slated to open in 2019.

Motion simulators

Atlanta-based **Pulseworks** has been in the business of supplying motion simulators to museums, science centers, and aquariums for 20 years. The company's business model is based on supplying turn-key systems on a revenue-share basis, with no upfront cost to the venue. In 2016 it deployed its first VR-enhanced simulator, branded the "VR Transporter," at the **National Museum of the U.S. Air Force** in Dayton, OH, which also has a GS theater.

Pulseworks has since supplied VR Transporters to the **Smithsonian's National Air and Space Museum**, the **Denver Museum of Nature and Science**, and the **Saint Louis Science Center**. Jackie

Mollet, managing director of visitor services for the Saint Louis Science Center, is pleased with how the VR Transporter has added to the center's business, saying it has "increased our overall sales and had a positive impact on visitor satisfaction. As a free-entry science center, we are always looking for incremental ways to diversify revenues and increase per-cap, and the VR has done that for us." Pulseworks' CEO **Raj Deshpande** adds, "this upsell also works for institutions with a paid admission."

The system comes with VR content produced by Pulseworks. The first two educational shows, each with running times of about six minutes, are *Spacewalk* and *Dive in Prehistoric Seas*. More VR content on natural history and physical science subjects is in the pipeline. The four-seat VR Transporter occupies a small footprint of about 15 feet (4.6 meters)



Pulseworks' VR Transporter combines a motion base with VR head-mounted displays.

Copyright Warning and Notice

It is a violation of U.S. and international copyright laws to reproduce all or part of this publication or its contents by any means. The U.S. Copyright Act imposes liability of up to \$150,000 per issue for such infringement.

Information concerning illicit duplication will be gratefully received.

Individuals and organizations wishing to reprint articles from *LF Examiner* must obtain written permission from us in advance.

The opinions of contributors are not necessarily those of *LF Examiner* or its parent company, Cinergetics, LLC.

Trademarks referred to in *LF Examiner* are the property of their respective owners.

square, and requires clear height of no more than 10 feet (3 meters). (Additional space may be needed for ticketing and queuing). The first few units were enclosed cabins, but Pulseworks has concluded the enclosure is not actually necessary, and has deployed “enclosure-less” systems, too.

Could some or all of a GS theater’s seats be converted to support a VR Transporter experience? Deshpande admits “it could be done,” and his company is “exploring some ideas, [but] the technology is not there yet. We are scaling to 8, 16, 20, and larger seat deployments, but a full GS theater would need something different,” probably an array of many small motion platforms.

What about the cross-media opportunity: working with a GS producer to capture content that can be used in a Pulseworks attraction? “Absolutely,” was Deshpande’s quick response. He added, “it would be great for [the GS producer’s] high-tech profile. We have talked to a number of producers.” But the challenge for such cross-media collaborations is that VR demands high frame rates – 4K at 60 fps capture at a minimum, but preferably 120 fps – and close-ups. “Long shots have no relevance” in VR, Deshpande explains. He’s encouraged that VR camera technology is getting better, as is image-stitching software.

Flying theaters

The “flying theater” concept shares many of the characteristics of giant domes and flat screen theaters, and has been gaining in popularity. Disney is credited as the first creator of the flying theater, with the 2001 opening of its *Soarin’ Over California* attraction at Disney California Adventure theme park in Anaheim, CA. (The original film was shot and projected on 15/70 film at 48 fps, but the

California site was later converted to digital projection.) This version of a ride-film theater combines a seating system that stacks moving seats in gondola configurations (so that guests’ legs can dangle) with a film projected onto a giant vertical dome, enhanced with 4D effects like wind and scents. Disney has since opened *Soarin’* attractions at EPCOT in Orlando, FL, and the Shanghai Disneyland Park in China, with a new film *Soarin’ Around the World*. The *Soarin’* rides were developed by Disney using proprietary technologies that are not available to other venues.

However, Taiwan-based Brogent Technologies supplies similar flying-theater systems, branded “i-Ride,” and expects to have 20 locations operating around the world by the end of 2018. Like the *Soarin’* rides, the i-Ride projection screen is a large hemispherical dome perpendicular to the floor, which Brogent emphasizes is key to the sense of immersion.

The first i-Ride was *FlyOver Canada* in Vancouver, BC, which opened in 2013 in the building that was formerly the IMAX Theatre at Canada Place, the world’s first IMAX 3D theater (see *Shorts, Summer 2013*). Typical of most i-Ride attractions, Vancouver’s dome is 60 feet (18 meters) in diameter, and uses a single 4K projector running at 60 fps.

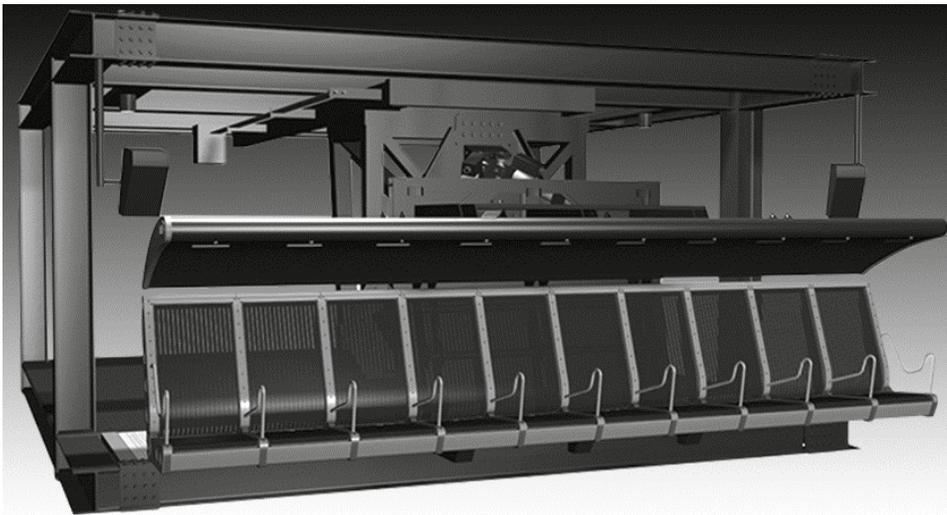
Another former IMAX theater, in Australia’s Dreamworld theme park, will be converted to a *FlyOver Australia* attraction later this year. The *FlyOver America* attraction at the Mall of America in Minneapolis, MN, opened in 2016.

Each of the 13 current i-Ride venues has its own signature film. The films are about four to five minutes in theme parks like the *Voletarium* i-Ride at Europa-Park in Rust, Germany, and eight minutes long at standalone attractions like Vancouver and Minneapolis. Ticket prices at those two venues range from about US\$12 to \$22.

Stefan Rothaug, senior marketing specialist for Taiwan-based Brogent, is bullish on the prospects for converting more GS theaters, based on the experience in Vancouver: *FlyOver Canada* reportedly crossed the two-million-visitor threshold part way through its fifth year, and the trend is up, with attendance at 600,000 in 2017, comparable to the peak years’ performance of the IMAX 3D theater that operat-



FlyOver Canada in Vancouver, BC, features technology from Brogent Technologies.



Brogent's i-Ride motion bases hold ten riders and can be stacked.

ed on the site from 1987 to 2009.

What do GS theater operators need to know if they want to consider a conversion to a flying theater? The Brogent i-Ride package consists of the ride hardware and control system, special effects, dome screen, and the projection and sound systems. The client is responsible for building improvements to accommodate the system, and for contracting with a producer to make the film. The auditorium footprint has to be at least 66 feet (20 meters) square, with clear interior height of at least 50 feet (15 meters). According to Rothaug, a good budget estimate for the client's total costs is \$15–20 million.

There is no precedent for sharing or licensing i-Ride films, because they tend to be destination films specific to the locale. So a GS theater thinking about converting to i-Ride would probably do so with the plan of creating a custom flyover film that would play for years.

Could an educational i-Ride film work? Rothaug believes so. He imagines an educational film that would “fly through a hurricane, or outer space, or under the sea.” But re-purposing footage from a film made for a GS documentary to a shorter i-Ride flyover film would pose a “creative challenge.” The i-Ride needs the content to be shot from the front view of the helicopter or drone used for filming, whereas a lot of GS aerial shots are captured from side-mounted cameras.

Brogent has also created a more com-

pact and significantly less expensive VR-based, motion-enhanced system, branded “Q-Ride.” This turnkey ride system has 12 seats arranged in a triangle around a center core. Acer head-mounted displays (HMDs) and separate headphones are tethered to the system's computer. The VR shows run about five minutes. Total package price, including one VR show, is about \$500,000.

Motion seats

Rather than re-configure the auditorium

and change the entire projection system, some theater operators may consider replacing just some of the seats with motion-enhanced seats, such as those from Quebec-based **D-BOX Technologies**. The company serves entertainment and industrial markets, but the 640 commercial multiplex screens in 36 countries with D-BOX seats makes that segment one of its largest.

D-BOX doesn't actually manufacture the seats, it designs and installs the motion platforms and systems that deliver motion and vibrations to compatible seats (including recliners and rockers), synced to the action in the movie. Typically, exhibitors choose to turn only a few rows of seats into D-BOX seats, though entire auditoriums have been converted in some cases.

D-BOX personnel work with the movie's creative team to artistically score an immersive motion track, creating an electronic file that sends instructions to the seats for vibration and motion. The exhibitor pays for the in-theater hardware; the exhibitor, distributor, and D-BOX share the up-charge revenue collected from theater admissions.

Michel Paquette, vice president of corporate affairs, told me that D-BOX would



Two rows of D-BOX seats in a multiplex theater.



MediaMation's four-seat motion base.

definitely be interested in supplying giant-screen theaters in museums and science centers, and working with GS producers.

The company has recently introduced D-BOX VR, a product that pairs its enhanced theater chairs with an individual VR experience, for installation in theater lobbies as a separately-ticketed attraction. Their first VR show, from the LA-based **Virtual Reality Company (VRC)**, is an animated 12-minute, family-friendly VR show, *Raising a Ruckus*. The main characters are young twins whose dog, Ruckus, "leads them on a rollercoaster journey through a thrilling prehistoric world," according to VRC. D-BOX's Paquette adds, "we suspect this could lead to a series of VR shows" based on the characters in the first installment.

For its first lobby installation of ten D-BOX seats, D-BOX chose Cineplex's **Scotiabank Theatre** in Ottawa because of that multiplex's strong attendance and family demographic. D-BOX has also supplied its immersive motion system to complement *The Martian* and *Goosebumps* VR shows.

Paquette emphasizes that D-BOX doesn't do other 4D effects like wind or scents: "The immersive motion brought by our science and artists is our thing." He believes that "high-definition motion" is the single most impactful special effect. Paquette also says that the seats "can surprisingly reproduce [the sensation of] free-fall," which could enhance GS documentaries or VR content with motion sequences underwater, over land, or in space.

4D experiences

MediaMation is an integrator of 4D EFX theaters located in Torrance, CA. It supplies systems to cinemas and attractions, the latter sector including museum clients such as the **Michigan Science Center (Mi-Sci)** in Detroit. MediaMation provided Mi-Sci with a 4D theater that incorporates multiple effects with static, cinema-grade seats installed in groups of four. The company programmed 4D effects for the 20-minute 3D version of **National Geographic's *Extreme Weather***, which plays in the Toyota Engineering 4D Theater. (Mi-Sci also has a planetarium and an IMAX Dome theater with 15/70 film.)

MediaMation doesn't have its own library or content distribution, so clients license content from outside producers and distributors such as **nWave Pictures**, **Super78**, and **The Juice** (whose library of 4D titles includes content from nWave, **Giant Screen Films**, and several independent fulldome producers).

MediaMation then provides the programming for the effects, the costs of which are included in the content package. Four-D effects can include several from a large menu: air blasts, scents, water spray, leg ticklers, motion seats or seat "rumblers," back pokers, etc. Atmospheric effects can include wind, rain, snow, bubbles, and fog.

MediaMation's VR entry is the REACTIVr, available in a two-seat 4D EFX pod and Motion EFX vehicle. REACTIVr is a VR gaming platform that combines VR with 3-DOF (three degrees of freedom) motion and 4D effects. The typical running time of each VR game is five minutes.

Cross-platform productions

Producers and distributors of GS documentaries, driven by the need to supplement film licensing revenues, are looking for cross-platform opportunities. A few have already begun producing for both GS documentaries and other platforms, such as VR/360 video and 4D attractions.

Headquartered in Brussels, Belgium, with offices in the U.S., nWave Pictures was the first GS producer to create content for GS theaters in museums as well as ridefilm theaters in other venues. **Janine Baker**, nWave's senior vice president for distribution and development, says that their 1997 GS film, *Thrill Ride: The Science of Fun*, was "the first cross-platform film, as it contained various scenes of rides [e.g. *Devil's Mine Ride*] and one full ride: *Virtual Time Machine*." Baker adds, "This was the vision and strategy from the very beginning, and [has] continued successfully for over twenty years."

nWave's feature films have always had a related 3D and 4D attraction film. Before production begins, nWave looks for stories that work across several platforms. *Fly Me To the Moon* (2008) and *Sammy's Adventures* (2010) "were made as features, and had a giant-screen version, a 4D attraction version (three for Sammy), and



Michigan Science Center's 4D theater with MediaMation seats.



nWave's 2008 feature *Fly Me to the Moon* was made with a ride version in mind.

gar Omni Theater (a 30-year-old IMAX Dome with 15/70 film), is “very pleased with the 4D theater,” for which SimEx supplies the hardware and content. In the more than three years since the 4D theater opened, Doty has enjoyed working closely with SimEx “to tailor title selection” for various audience segments, and having opportunities to “weigh in on the evolution of new topics and treatments.” The short running times of the shows (13 to 18 minutes) don’t intrude on visits to the exhibit halls. Doty also likes that they add an “extra dose of fun to visitors’ time at the museum.” He reports that the museum’s success with the 4D theater has attracted visits from managers at “numerous other institutional sites... to see what might be possible in their locations.”

Although SimEx made a foray into VR twenty years ago, for now it is taking a wait-and-see approach and not offering a VR-based attraction.

D3D Cinema introduced a unique VR product to museums last year: the **Birdly** full-body VR flight simulator from **Somniacs**. Birdly has been installed in several institutions, starting with the **Tech Museum of Innovation** in San Jose, CA, followed by the **Houston Museum of Natural History**, and the National Aviary in Pittsburgh.

Michelle Duncan, the Tech’s IMAX theater operations director, has been quite pleased with how Birdly has “added to the guest experience” since installing the system in March 2017. She sees no evidence of any cannibalization of her theater revenues, noting that it tends to be a “spontaneous purchase decision” by museum guests, whereas the IMAX Dome theater tends to be a planned or pre-booked

a ride version for *FMTTM*.”

What is nWave’s current interest in VR? Baker says that while she appreciates the marketing and PR benefits, she notes certain challenges of VR: “the headsets, lack of picture quality,” and the fact it is “not a shared experience.” She believes the “technology should improve... hopefully before audiences lose interest, as they did with the 3D TV.”

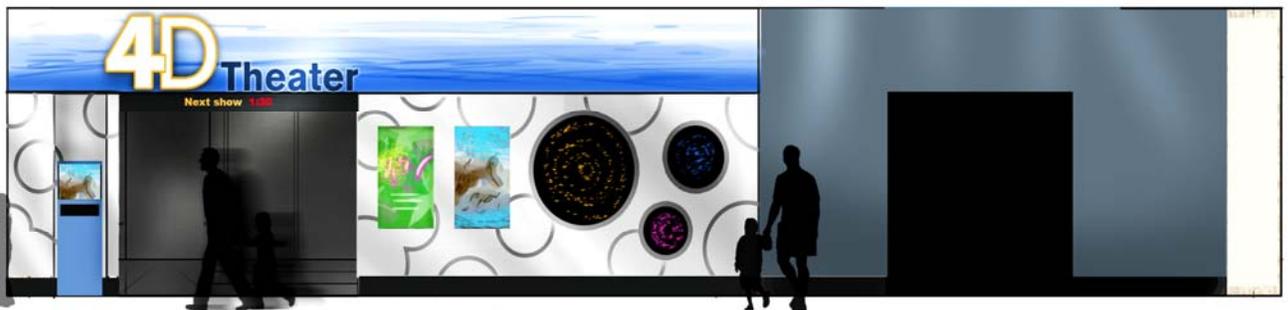
California’s **SimEx-Iwerks** has supplied systems and short-form content for 2D/3D/4D ridefilm and 4D FX theaters for more than three decades. Theater clients include zoos, aquariums, museums, and science centers. In 2013, the company released a 12-minute 4D version of National Geographic’s 40-minute GS film, *Sea Monsters: A Prehistoric Adventure*

(2007), to its 4D theater network. It performed very well, generating a new revenue stream.

More recently, SimEx began distributing short versions of **BBC Earth’s** *Tiny Giants* and *Shark* to its 4D theaters. **Mike Frueh**, senior vice president for licensing and distribution says, “*Shark 4D* is currently our most popular BBC film.”

Several institutional operators of GS screens have SimEx 4D attractions, including the **Museum of Science Boston**, **Moody Gardens** in Galveston, TX, and a few science museums in China. Frueh says that several GS theater operators have contacted him seeking proposals for replacing their theaters with a 4D theater attraction.

Robin Doty, manager of Boston’s **Mu-**



The façade of the Museum of Science Boston’s SimEx 4D theater.



Somniacs' Birdly motion base is distributed to museums and science centers by D3D Cinema.

experience.

According to an October 2017 press release, D3D is developing a new “underwater coral reef show (manta ray and sea turtle) with ocean conservation messaging,” that will complement *Oceans: The Blue Planet*, produced by BBC Earth and distributed by D3D’s sister company, Giant Screen Films.

Derek Threinen, vice president of film distribution and business development for the two companies, says that “we are in advanced production on a dinosaur experience in conjunction with an upcoming dinosaur-centric GSF film release. The Birdly dinosaur experience comes to the platform this spring, while the film is slated for 2019.” This is a good example of a GS film producer and distributor using another platform in a complementary way, earning license revenue from both exhibition types.

Virtual Reality

Philadelphia’s **Franklin Institute** one was of the first science museums in the U.S. to integrate VR enhancements with its exhibits, beginning in October 2016. Since then, others have followed its lead, such as the Tech Museum, the **American Museum of Natural History** in New York City, and the **Arizona Science Center** in Phoenix, all of which also have GS theaters.

The Franklin Institute created a VR

demo space and two separate VR zones in conjunction with exhibits on outer space and brain, each with ten HMDs. VR is a value-add feature: there is no upcharge for admission. The museum kept costs down by buying off-the-shelf equipment, including Oculus Rift and HTC Vive HMDs, and using content from the SteamVR library. (In fact, the *Blue Whale* VR demo Franklin uses comes with the Vive). In the first 15 months, 150,000 guests have tried

VR at the museum.

Susan Poulton, chief digital officer, saw the introduction of VR as something that went beyond enhancing museum exhibits: “It’s about technology accessibility.” Guest surveys reveal how well they did: of those who have tried the Franklin’s VR, 65% did so for the first time, and 33% hadn’t even heard of VR before their visit. And she credits their decision to allow kids to participate in the VR attraction as key to its adoption by adults.

Poulton’s pursuit of technology accessibility was meant to encourage colleagues, too. “Our goal was to be a catalyst to other museums embracing this.” She has helped her peers at other museums overcome their objections to, and in some cases, fear of trying VR, saying that her message to them is, “if you don’t do something in VR, it will pass you by.”

The Franklin Institute has also added augmented reality (AR) as a companion to its current exhibition on China’s Terracotta Warriors. Guests download the app to their smartphones, the phone’s camera recognizes the statues, and graphical info and images become available via “hotspots.” For instance, a virtual ancient bronze weapon can be placed into the hands of one of the statues.



The Tech Museum of Innovation was one of the first museums to install Birdly.



The Franklin Institute's VR demo space.

cial failure of the VR headset that you're seeing [VR center operators] use this moment to take the medium to the public. It's like the early days of PCs, where we had internet cafes."

Operators of VR centers with whom I spoke for this article talked about how the venues attract people with varying degrees of familiarity with VR, from the "never-done-it-before" segment to the "light user" to the "heavy gamers" with lots of VR experience under their belts.

Arcades offer a relatively inexpensive way for the average person to get acquainted with VR, compared to buying all the gear for in-home use. VR centers also offer operators and guests alike the chance to try out different HMDs.

From a content standpoint, operators talk about how guests like competition, so VR multi-player games are emerging as the preferred content type. The addition of light 4D effects (such as wind and seat vibration) can help keep VR positioned as an out-of-home experience worth the admission price. While the group size may be small (up to four players at once), multiplayer VR games are fun, social experiences. VR games could translate to small-group educational experiences too, although the throughput pressure of offering them to school groups of 20 or more students might be challenging, to say the least.

The throughput problem

VR hasn't taken off with theme parks because of the throughput problem: for a theme park with 10,000-plus visitors per day, it is practically and economically impossible to process all those who might want to try VR, especially when most VR experiences are individual, not shared with a large group of people.

On the other hand, VR arcades have begun to proliferate. Some are part of standalone gaming centers, others are being added to multiplex lobbies. So far, most VR content has come from a variety of sources not related to film franchises, but we can increasingly expect more to be tied to tentpole Hollywood releases.

Imax Corporation is an early entrant, with its pilot standalone VR center in Los Angeles and five others now operating in multiplex theaters with IMAX screens in New York, Toronto, Shanghai, and Manchester, UK (see *The Biz*, January 2018). Separately from Imax's efforts, **AMC Theatres** has announced plans to build six "Dreamscape Immersive VR centers" in the U.S. and U.K. by 2019; some will be repurposed existing movie theaters, while others will be standalone installations.

But could a VR arcade be added to a museum, perhaps next to the GS theater? The potential tie-in between a new GS film and its VR companion seems intuitively obvious, but we have a chicken-and-egg situation: there isn't enough demand for educational VR content, so planning

major hardware installations by museums and prospective vendors and partners isn't happening yet. Without the installed base of VR centers demanding edu-tainment content, VR producers aren't in a rush to create it.

Even though they are mainly in commercial locations, VR centers are acting as incubators, helping introduce the technology and experience to mass audiences even as the adoption of in-home VR has been slow to take hold. As **Igal Nassima**, a programmer and the founder of VR/AR producer **Superbright**, told the *New York Times* recently, "It's due to the commer-



The Franklin Institute used AR to enhance its Terracotta Warrior exhibit.



The IMAX VR system and business model are being tested in six pilot locations around the world.

“CAVE” (Cave Automatic Virtual Environment), in which the walls “feature 3D volumetric projection, and users wear head-tracked glasses so that the world around them moves to their true perspective. This lets people work collaboratively, without requiring access to highly sought-after tools or equipment, and with no risk of physical harm to themselves.”

While VR could be a “great tool” for certain collaborative experiences or tasks, such as “visualizing large and complex data sets” for manufacturing purposes, Steele suggest that “for applications where maintaining a group experience is important, such as training, using large-format immersive environments like CAVEs are more suited.” This could be applied to a school group experience, too.

Integrators like HoloVis like to embrace disruptive technologies to create new experiences. Steele says the big one for them — and one that she thinks GS producers and exhibitors should watch for — is the ability to gather and track data on guests as they consume the experience. She believes this will ultimately transfer power from the creators to the consumers of content. Users will increasingly have the ability to control their experience. How important is designing interactivity into content for themed entertainment content creators? Many contacted for this article say it is becoming increasingly significant.

Beyond VR

HoloVis is a designer and manufacturer of a range of large-scale display solutions, including VR applications, for the entertainment and enterprise sectors. Producers and integrators of consumer VR experiences have accelerated their learning by creating enterprise VR applications. For instances, HoloVis has used VR for pre-visualizations of retail store fit-outs and layouts.

The company is now creating immersive spaces that track people as they walk through them. A virtual character could approach you and address you by name. The interface? Your own mobile phone. So far, most of these implementations are in theme parks. HoloVis has also created new interactive theaters, although it is seeing a trend to retrofitting existing spaces with such interactive technology. A dome-screen auditorium could be one such optically-tracked space.

How do creators of VR experiences see the tech becoming economically viable for museums and science centers? The holy grail is finding a true group-oriented VR experience. Amy Steele, HoloVis’ vice president for attractions, sees “a big future for group-orientated, multi-device collaboration, encompassing VR.” She believes that HoloVis’ experience with enterprise solutions could be applied to creating a com-

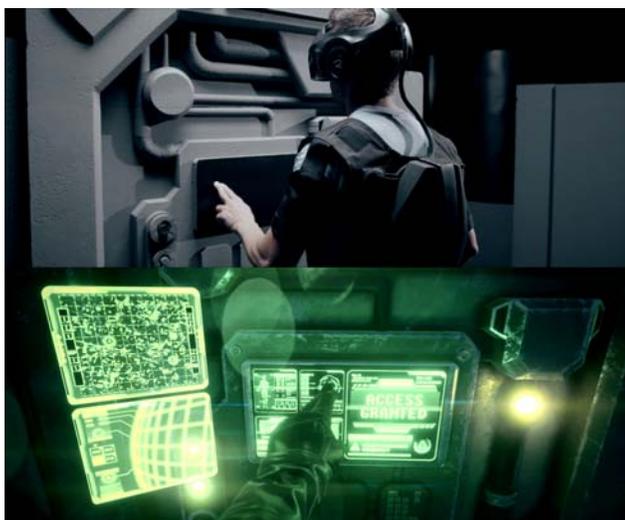
elling museum-appropriate experience.

For instance, considering science centers’ connections to academia and organizations like NASA and JPL, Steele imagines they could acquire “data that would allow a VR content creator to design an authentic Mars-scape. Led by a docent or science educator, school kids could have a walking tour of the surface of Mars, inspiring them to want to learn more when the tour is over.”

HoloVis sometimes uses a



HoloVis believes CAVEs could have applications in museums.



The VOID's free-roam VR experience.

Free-roam VR

VR experiences that allow the user to walk somewhat freely through a space while wearing a head-mounted display have been given the moniker “free-roam VR.” Commercial leaders of this concept are **The Void** and **Zero Latency**. As the hardware and labor costs to set up and operate these attractions are coming down, free-roaming VR becomes more accessible to other integrators.

Zero Latency is a fast-growing pioneer of warehouse-scale free-roam VR for “social gaming.” Today it has 17 sites on three continents. By 2020 it plans to have 100. Conceived as commercial attractions, so far they are in gaming centers, shopping malls, and resorts like the MGM Grand Hotel and Casino in Las Vegas. The space requirement for a Zero Latency site is about 2,000 square feet (186 square meters), i.e., 45 feet (14 meters) square, with a standard eight-foot (2.5-meter) ceiling height.

Each game can accommodate up to eight players and lasts about 30 minutes, at a price of \$50 per person (in a standalone commercial VR center). I asked **Tim Ruse**, Zero Latency’s co-founder and CEO, if he could see creating educational versions of VR games for museums. “Absolutely,” was his immediate reply. He thinks his platform would be “perfectly suited” to a museum setting. While agreeing that the throughput issue limits the viability of VR attractions at theme parks, he imagines that the flow of

guests could be more easily managed in a museum.

Senior museum managers with whom I have discussed this are intrigued, agreeing that not only is throughput a key issue, but that the economic feasibility would need to be studied, looking at what markets will bear as an add-on ticket price, together with the added labor costs.

Ruse expects improvements in technology will enhance the experience for guests and venue operators alike: as the gear gets smaller, there will be less for users to wear, and turnaround times will be shorter.

The consensus among all integrators working in VR is that it must be a uniquely out-of-home experience that consumers could not replicate in their own homes. This means incorporating interactivity, collaboration, and the use of motion. It can also mean adding 4D effects.

VR in museums

There is no shortage of interest in VR among GS theater operators. In the 2017 Theater Programming Survey fielded by my company, **Blaze Cineworks**, almost four in ten programmers of GS theaters said their organizations planned to introduce some form of VR (or AR, or 360 video) in the future, most in the next one to three years.

Whether it’s VR or another media-based attraction, the need for continuously improving the guest experience is paramount. As Pulseworks’ Deshpande says about what guides his company’s

developments, “the ‘wall of WOW’ has to be climbed constantly.”

None of this is to say that GS theaters and filmmakers should re-tool for a wholesale replacement of the GS film experience. Not at all. However, experimenting with new media-based experiences and content, inspired by technologies used there theme parks, family entertainment centers, or planetariums, is not a bad idea for the GS industry.

After all, would the GS world have developed as it did if one science center in the early 1970s had not challenged the maker of a new large-format projection system to adapt its invention for a dome screen? The manufacturer was **Imax Systems Corporation** and the museum was the **Fleet Science Center** in San Diego, which installed the world’s first OMNIMAX system in 1973, also becoming the first museum customer of the young Imax.

Paul Fraser is president of Blaze Cineworks LLC, a consulting and project management firm that serves content and theater clients in all forms of digital cinema. Blaze also helps develop VR companions for giant-screen and fulldome producers. www.BlazeCineworks.com



Zero Latency's free-roam VR system puts all the tech in a wearable package.