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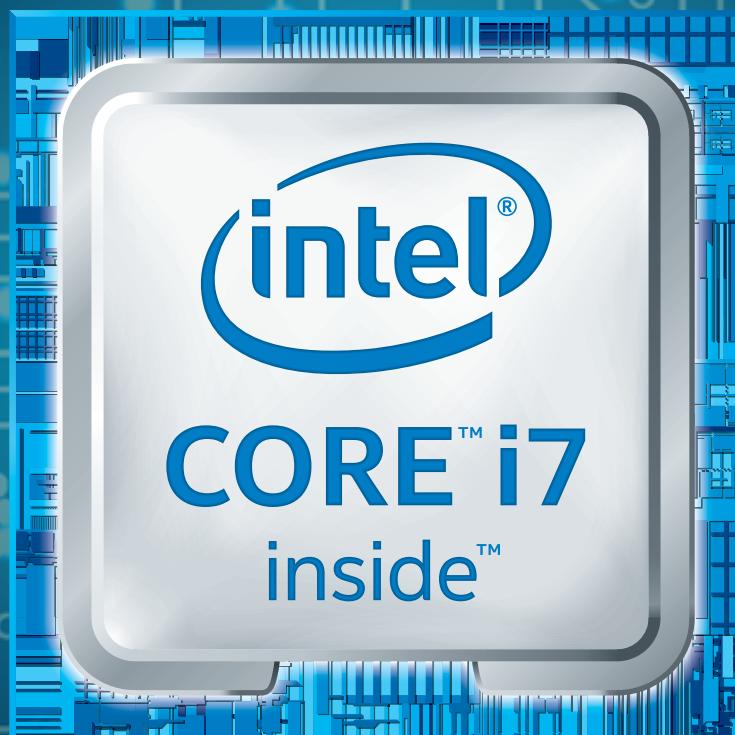


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Jason Pohl and James Kerr
get real in a no holds barred
interview

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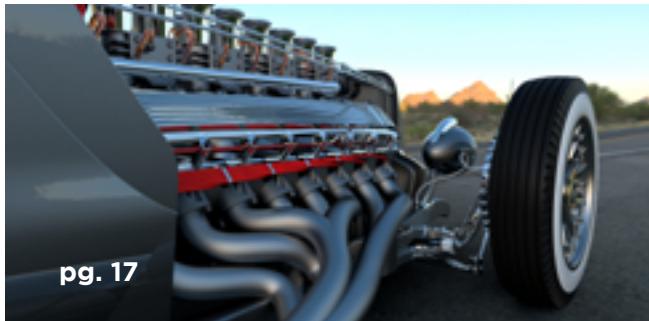
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My Active Studio

Boutique design, VFX, and animation studio My Active Driveway goes big with BOXX, creating national commercials for high profile clients.

Timeless Designer

Daniel Simon loves machines. To him, a vehicle is not merely something you drive, sail, or fly. It's also more than just a work of art.

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**SEE THE FULL BOXX CATALOG OF BOXX WORKSTATIONS, MOBILE WORKSTATIONS,
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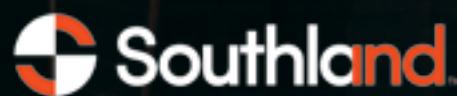
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BOXX Customers





BOXX CUSTOMER
STORY
BY: JOHN VONDRAK

VIZLAB

When leading architecture and engineering firm PBK needed state-of-the-art rendering for their new visualization lab, they chose BOXX

Jose Galindo is the Director of the PBK Visualization Lab (or VIZLab as he likes to refer to it), a San Antonio-based illustration and animation group within PBK Architects, a national architecture and engineering solutions leader focused on K-12 school, higher education, healthcare, corporate, and government clients. “The firm has been providing professional planning and design services for more than 34 years and has established a strong reputation for its unique approach to performance-based design and responsive customer service,” says Galindo. “We effectively facilitate a collaborative, consensus-generating design process that produces customized, purpose-specific, building environments which enhance end-user performance. We also maintain strict control of the client’s budget and schedule objectives.” PBK has offices in Houston, Dallas, Fort Worth, San Antonio, Austin, and McAllen.

In 2014, when PBK CEO Dan Boggio announced the creation of the VIZLab as an independent group within the firm, it was understood that the new division would be tasked with specific goals, chief among them, providing clients with dynamic, real-time, life-like, project visualizations prior to the start of construction. At its inception, the VIZLab primarily assisted PBK’s Higher Education division (also based in the San Antonio office), but it wasn’t long before that changed. “Now that the group has grown in its capabilities,” says Galindo, “we’re taking on projects sourced from the entire firm. Also, the VIZLab has the capability to work with outside clients on a variety of project types ranging from renderings to augmented reality presentations to mobile application development.”

Galindo has worked in the A/E industry since 2005. Prior to PBK, he owned a small San Antonio illustration firm and had a stint at Jacobs Engi-



neering, the Fortune 500 international technical professional services firm. The other VIZLab team member, visualization specialist Oscar Veloz, is an architecture school graduate of the University of Texas at San Antonio. Veloz began his PBK career as an intern in January of 2014, but transitioned to the VIZLab later that year.

Together, Galindo and Veloz have built the VIZLab from the ground up, helping PBK develop stunning new visuals and client presentations.

THE CREATIVE PROCESS

In most cases, when the PBK VIZLab receives a request from one of their offices, they ask the project team to send either a SketchUp or Revit model, along with any related drawings, such as site plans and material boards. After reviewing all the materials, the VIZLab crew gets down to business. “We have a kickoff discussion to determine how our illustrations will be used so we can tailor the look and feel of the imagery to best fit the presentation,” says Galindo. “PBK typically has established, long-standing relationships with its clients, and I find that our more senior staff often have intimate knowledge of what specific clients like and dislike.”

As an example, Galindo cites a recent VIZLab animation developed from a request that the client presentation play within a high school yearbook (see accompanying video). The sequence, which bookends the presentation, was created in Adobe After Effects and features images of the school and its alums amid turning yearbook pages. It begins when the existing school was built and travels through the ensuing years, leading to the present day and the unveiling of the new school design. It’s an ingenious concept, but Galindo and Veloz weren’t finished yet. The team went one step further when, at the suggestion of the project manager, their visuals were accompanied by a popular song—one the PM knew would surely inspire the client. Galindo admits that this type of presentation is a bit uncommon. In more typical situations, where a pre-determined creative direction doesn’t exist, the VIZLab works with the project team’s point of contact to create storyboards and establish a sketched out direction for the project. “Once we have worked through a storyboard and feel happy with our creative direction,” says Galindo, “we jump into Autodesk 3ds Max and begin modeling, texturing, and lighting our projects.”

WORKFLOW

Dependant on what group sends them a project, the VIZLab workflow begins with either a Autodesk Revit model or a model out of SketchUp. If it comes from Revit, Veloz usually cleans up the model as needed and then links to it from 3ds Max. "We thoroughly enjoy working from Revit," says Galindo, "because it makes it easy for us to apply changes to the model that came from the project teams. When we get a SketchUp model, we usually remodel the project in 3ds Max and use the SketchUp model as a reference. We spend most of our time in 3ds Max and rendering with Vray 3.0, but we also rely heavily on Adobe Photoshop, After Effects, and Premiere Pro. When we have elaborate environments, we'll use eon Vue because it can create intricate landscapes and environments quickly. In situations where we have tighter deadlines for animations, we use Lumion because it integrates with SketchUp and Revit well and renders very quickly on the GPU." The VIZ Lab manages the render farm load with Pipeline FX Qube! render management software and at present, is working with Pipeline FX to develop a new job type for SketchUp so they will be able to distribute render jobs from SketchUp through the Qube! interface.

RENDERING DILEMMA

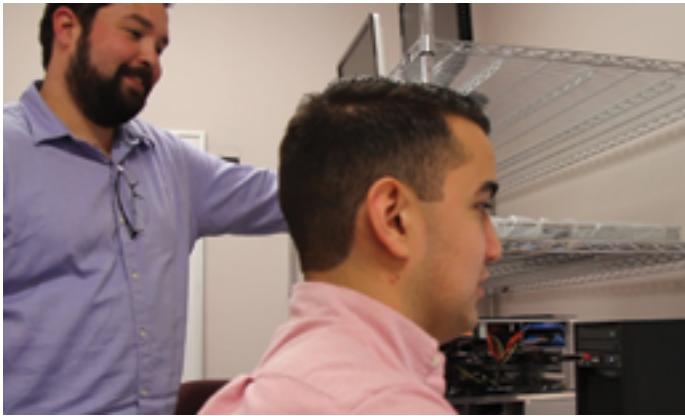
Although the whole rendering process sounds ordered and efficient now, Galindo says that wasn't always the case. In fact, when he first arrived at PBK, it didn't take long for him to see that the rendering process left much to be desired. "All we had were standard Dell 3600 machines and a render farm made up of various unutilized computers," he recalls. "In the beginning, I would spend more time trying to get the farm running and stay running than I would actually working on projects." Realizing that they couldn't execute projects efficiently and wanting more from final product, Galindo spoke with Boggio about starting the VIZLab. Fortunately, the wise CEO quickly agreed that an illustration group in PBK would be a valuable asset to the firm's workflow. Given the 'go ahead,' on creating the VIZLab, Galindo set about establishing a proper render farm.

CALLING BOXX

He already knew his next move. While employed at Jacobs Engineering, Galindo had watched a render farm demonstration presented by BOXX



Technologies. Needless to say, it left an impact. “At the time, we were substantially building up our rendering capabilities in our San Antonio office,” he recalls, “and I was very impressed with the demo that BOXX gave us.” Over the past few years, Galindo also enjoyed occasional opportunities to use a high performance BOXX workstation. “When it came time to purchase a render farm for the VIZLab,” he says, “my first thought was to approach BOXX.” When Galindo contacted the Austin, Texas-based hardware manufacturer, the voice on the other end of the line was BOXX performance specialist Rich Petit. “The entire experience was awesome, Galindo recalls. “Rich was very knowledgeable and always quick to respond to my questions and concerns. He was very sensitive to my needs and budget, and I never felt like he was trying to sell me more than what I needed.”



TURN KEY SOLUTION

What PBK needed was a RenderFarm On Wheels (ROW), the ultimate turn-key render farm, available in a wide range of sizes and expandable to over 80 modules (2880 cores). The complete hardware package included rack-mounted, dual CPU render nodes held in a mobile enclosure. When the ROW arrived, Galindo was surprised that it fit into two boxes and delighted that it only took an hour or so to assemble. The real excitement, however, began when he put it to work. “Once I had all our software installed,” he says, “I was amazed that I could now render, in a matter of minutes, projects that previously took hours upon hours to complete. Since that point, we haven’t had any down time on the farm; it simply works. The ROW allows our small group to output work at a rate that would have never been possible if we were using our previous impromptu farm.” An added bonus is that Galindo no longer spends hours maintaining a render farm. “The new tech-

nology has allowed our team to spend more time executing our projects, rather than stopping work earlier than necessary to render,” he says. “In addition, having the ROW allows us to iterate many changes without worrying about render times getting in the way of our deadlines. It’s amazingly effective to be able to render multiple jobs and thousands of frames at nights and on weekends, and know that in the morning, our jobs will be finished and we can spend our day working.” As for legendary BOXX Technical Support, Galindo has only needed to contact them once, and like the rest of the BOXX experience, it went as expected. “They were extremely quick to respond and solve our problem,” he says.

EXPANDING THE FARM

At present, PBK uses built workstations, but as the group continues to grow (and after seeing how their RenderFarm on Wheels performs), Galindo believes he will likely be making a transition over to BOXX workstations in the future. “If the performance and reliability of our ROW is any indicator, BOXX workstations should perform on par with our built machines while being more reliable,” he says. Galindo would also like to expand the render farm. “I see our workflow transitioning into a heavier GPU-compute workflow and away from pure CPU rendering. As a result, BOXX solutions make even more sense over competing solutions. I know that I can go to BOXX and get a four GPU workstation custom-tailored to my workflow. As far as I know, similar custom configurations are not offered by the competition without a significantly higher price tag.” ■



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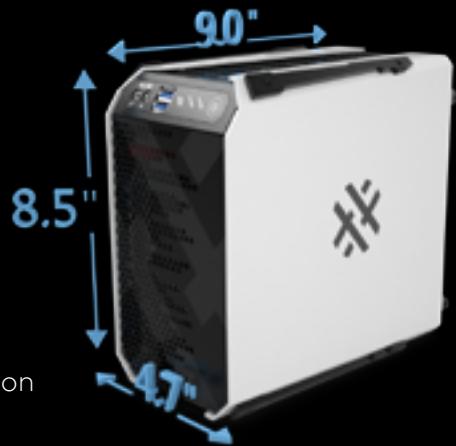
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ON SITE & ON TARGET

With BIM on the rebound, Phil Simon of SB Ballard swears by his GoBOXX mobile workstation

"You know what would really be useful is a BOXX notebook, something like an iPad, but interoperable with Autodesk, displaying models and working with 360. It would obviously have less capability, but to do what a field machine does as well as this laptop does...that would be something," says Phil Simon, as he muses on the ideal "field portable machine." For the time being, however, he'll have to settle for that "laptop" he refers to (and greatly admires), his GoBOXX 2725 mobile workstation. Philip K. Simon is the virtual construction manager for SB Ballard, the Virginia-based construction company that provides pre-construction services, general contracting, construction management, design build and concrete contracting services to an impressive list of clients throughout the mid-Atlantic and southeastern United States. From health-care, government, and education industries to arts, entertainment and sports, SB Ballard has grown to become one of the largest general contractors in Virginia.

A veteran of the United States Army, Simon served as a plans officer, diagramming planning, coordinating relations, and the like. Upon his honorable discharge, Simon labored in the trades as a carpenter, heavy equipment operator, and pipe layer, steadily working his way through the ranks until he became the chief operating officer for a Colorado civil construction company focused on land development. When he relocated to Virginia, he began his career with SB Ballard first as a quality control manager, then as a project manager. After awhile though, he requested a move to project controls, which evolved into BIM. "I don't really see sched-



BOXX CUSTOMER STORY

BY: JOHN VONDRAK

uling and other controls as anything different," he says. "They're all part of the same process."

Twenty-five years ago, Simon took college courses at night "just to keep myself entertained," he says, and when he saw Autodesk AutoCAD in the university bookstore for only \$200, he bought it and taught himself to use it. He's been using AutoCAD ever since—first as a junior estimator for a subcontractor where he was required to do shop drawings for all projects. In civil construction and land development, he also used LDD (Land Development Desktop) a great deal, as well as AGTEK. So upon his arrival at SB Ballard, Simon already possessed the basics of 3D modeling. "I just didn't know Revit," he admits. "But this is a very technology forward company with all the tools, so I took some classes on it and learned. And being interested in project coordination, BIM was a natural for me."

THE APPLICATIONS

Simon is unabashed in his love of Autodesk Revit, using it for all of his architectural modeling. "There are lots of things we can do with Revit," he says. "We do many of them, but like every contractor, we have these tools, but don't always have the time or manpower to use them in every way they can be used." Simon also relies on Autodesk 3ds Max for visualization animation. "When we do the marketing models, we usually create animations to show some of the viewpoints," he says. "We'll present the owner with walk-throughs so they can see things from different points of view, how things flow. We'll demonstrate what they can do to improve lighting or day lighting for LEED certification. 3ds Max is really useful for daylight studies and a lot of interior lighting studies as well. You may think of it as software for making cartoons, but it has a very powerful lighting package. Using photometric lighting, we can get very good ideas of how rooms are actually going to look."

In addition to Revit and 3ds Max, Simon relies on the entire Autodesk and Adobe CS suites. In Adobe, it's primarily Photoshop, Lightroom, and Premiere Pro for post processing and when a polished, overall movie-level look is desired. Animations are created in 3ds Max or Autodesk Navisworks, rendered out, sound is added, and the entire piece is cut together with captioning included. "Premiere is really flexible and you can lay down as many tracks as you'd like," says Simon. Animation also comes into play when the team works on their proposed schedule. They use Autodesk Navisworks to create timeline animations. "We do that in the field as well," says Simon. "With our monthly updates, we actualize the Navisworks Timeliner so that we can compare our baseline schedule work with the actual project and then learn what we're doing right or wrong."

THE PROCESS

"I start in Revit," says Simon. "It's the tool I know." SB Ballard's most common delivery method is "CM at risk" where they work very early with the architects and engineers who are still under contract with the owner and not with SB Ballard. Usually, SB Ballard gets involved at the schematic stage so the program requirements are already designed into the building. However, there are a lot of specifics that aren't completed like structural work and other specifications, so the construction company begins with a value engineering constructability review which improves the way the building is designed, therefore making it easier to build.

"In value engineering, we're obviously looking for things we can remove from the building to save money in the budget without impacting the functionality of the program requirements," says Simon. "The architect will give us a model and at that point, our big interest is using the model to develop a schedule and to look at the details that we're going to need." Simon and his team work directly out of Revit and in their constructability review, the project estimators and in-house consultants receive PDF and hard copy plans. Based on their particular areas of expertise, they provide comments which are then assembled by a coordinator. A series of collaborative constructability workshops (including the architect and owner) follow. Over the course of a few days and using the model, all comments are considered. "We'll sketch things up in the model that we think will make good details and make the project more feasible," says Simon.

Discussing the collaborative progress of a project, Simon points to a recent convocation center where the steel subcontractor was extremely critical to the design process, so he was brought on board as soon as possible. The subcontractor's early steel



model was created in Tekla, so Simon converted that into Revit and has been working with that in coordination ever since. “It was very critical that we had that model and got him involved early because once we get the contract for construction, we buy it out, get all of subcontractors on board, and write into our contract that they will provide us with an IFC compliant model management of any required shop regulations. From that point on, piece-by-piece, we strip out those things that the architects and engineers have given us and replace them with the subcontractor-provided shop drawings. Then we’re looking at actual coordination. If there is a VAV or an air handler, we know what brand, exactly what size, and exactly where the connections are. We’re looking for those mating surfaces and that spatial coordination. By the time we’re in construction, we have a model that is completely customized to what the subcontractors are going to provide.”

Following this, the model is converted to Navisworks, becoming the “as built model,” i.e., what SB Ballard provides to the owner at the end of the project for facilities management. It includes all RFIs and has all aspects tagged so the owner will know exactly what it is. “We’ll link it,” says Simon, “so they can click on something and it will pop up a spreadsheet that will show them what filter it needs, what light bulb it needs, who to call for maintenance.” At this point, the model is then pushed out to the field. SB Ballard requires all subcontract superintendents with coordination issues (steel and mechanical, for example) to carry iPads and use Autodesk BIM 360 Glue, the cloud-based BIM management and collaboration tool, so they don’t have to carry sheaves of paper around while performing their checks. “It’s great for substrate,” says Simon. “If you’re going to hang ductwork, the electrician has already been through. You want to know if he’s taken up any of your space and you can see that right away just by

walking down that hallway with your iPad and 360 glue—credible technology.”

Another portion of Simon’s time is devoted to marketing, where he provides customer presentations. “Most of the jobs we do are construction at risk or design build,” says Simon, “so we want to show the owner that we can visualize, as well as help them visualize and coordinate with what they want to build.” In nearly every bid, this involves the construction of a three-dimensional project model which also helps Simon and his team better understand the project when it is presented to the estimators.

WORKFLOW CHALLENGES

“In the pre construction workflow,” says Simon, “the challenge is interoperability. You have architects that use ArchiCAD and architects using CAD are a problem.” Simon bemoans the fact that IFC models do not “transfer necessarily as advertised” into Revit which results in a substantial loss of information. “I think there’s still a lot of work to be done from the IFC side and I’m not sure whether these are software manufacturer problems or whether these are IFC standards problems,” says Simon. “I think it’s a little bit of both.” Another challenge Simon and his team face occurs during the construction phase when subcontractors are slow to review the models and provide input. Another is when, out in the field, an old fashioned superintendent objects to using BIM and Simon must insist that they do. “I’m pretty rigid about it,” he chuckles, “but it saves everybody a lot of time and money if you can get them all on board. Getting buy-in is key and it really helps if the owner is into BIM. If an owner is aware of the BIM process and really wants to see it used, that makes all the difference in the world.”

Based on experience, Simon believes that the per-



centage of owners insisting on BIM is about fifty percent. "Some care very deeply while others think it's a waste of time," he says. According to Simon, there is also a fair amount that remain indifferent. Among subcontractors, Simon believes that it depends on the size of the company. Large subs are always on board, while for smaller outfits, there remains a financial barrier to entry. Simon points to the cost of his GoBOXX, professional desktop workstations, and the necessary software applications as proof. "You can get away with less especially if you're only using Navisworks," he says, "but as a GC, if you really want to get in the door, it's going to cost you some money and some dedicated people. If you don't have the workload to justify it, it can be difficult to find consultants who are good at BIM. We tried very hard and we have one or two consultants we go to for certain projects, but most of them are either incredibly expensive or they are on a steeper learning curve than we are. That's a challenge. A small general contractor is going to have difficulty finding someone to provide service because there just aren't that many of them out there."



WE'RE GOING WITH BOXX

Prior to his GoBOXX mobile workstation, Simon relied on a top-of-the-line Dell laptop primarily because at that time, he simply wasn't aware of BOXX. "Dell was extremely well-rated with an aluminum

case, good speed, and power for graphics," he recalls, "but it was nothing like this GoBOXX." Simon discovered BOXX during a trip to Autodesk University in 2012 where he actually shuffled his Dell laptop around, looking for a comparable model. "I had just got it, so it was still brand new," he recalls. "We didn't know too much about the available machines. Lenovo was there, HP too, and I asked them all, 'What do you have that compares to this machine?' They all said nothing. They didn't have anything like it. So I went to the BOXX booth and their reply was 'What do you need?' We made the resolution then that when it was time to get another machine, we were going with BOXX."

When discussing the speed and performance of his mobile workstation, Simon mentions the Intel processor and ten cores, but is also quick to credit the machine's cooling ability. "It has four good size fans underneath it, so it doesn't get hot. If you put my old Dell machine in your lap, you'd get blisters," he says with a laugh. "I had to keep a chill pad under it. Other machines tend to bog down when they get hot, but this GoBOXX doesn't and that's the big difference—failure rate. I think the ability to run cool makes a big difference in the life of the machine. Our IT guys check the logs of when things break down and my other machines have always broken down because of heat." When I ask Simon if machine failure ever occurred during a presentation, he replies, "Yes—especially during animation when you're processing a lot of graphics. Animation is where it really makes a difference. That's where that heat will get you. I think the combination of a lot of processing power, which makes it very fast, also generates a lot of heat."

You can't mention 3D applications these days without discussing rendering, so I ask Simon about rendering on the GoBOXX. He replies that heavy rendering with 3ds Max is offloaded to a renderPRO, the BOXX personal, deskside rendering module. "We only do that with 3ds Max, so I work in it ten percent of the time. These are typically animations where I'm rendering thousands of images—six images a second in a four to five minute animation. That gets to be a large rendering project. If I have something I need to do quick and dirty and don't have time to get it into 3ds Max, clean it up, get the lighting right, and all that, I can still do renderings out of Revit on the GoBOXX and clean them up in Adobe Photoshop pretty quickly." He adds that SB Ballard does very little rendering in Revit, but insists that his GoBOXX is significantly faster (twice as fast, in fact) as any other machine he's ever used. As for calculating rendering times on the GoBOXX, Simon acknowledges that there is no average—it simply depends on the detail of the model. "Yesterday I did an exterior stairway with a water feature next to it," he says. "Not an incredibly complicated model and I did it at a high resolution. It took four minutes to render. Best quality took twelve minutes. It was very fast. Doing a



NEWATER COMMUNITY COLLEGE
THOMAS W. MOORE FIELD

big model rendering with custom lighting and 3ds Max, you have a lot less control over what is rendered in Revit, so you can't turn things on and off. You pretty much have to render the whole model. It was intense—probably took twenty-five to thirty minutes. It would have taken several hours on the old machine. If the GoBOXX is not four times as fast, it's at least twice as fast. Waiting twenty to thirty minutes for a rendering like that is nothing."

When I ask Simon to explain the most substantial differences between the GoBOXX and his previous mobile, he pauses for a moment. "When you're actually navigating around the machine, the differences are subtle, but significant. The action on orbiting and panning is smoother so that you're less likely to catch and select the wrong thing—and that can be very irritating when you're modeling. If a machine is lagging just a little bit behind, you'll select and then you'll find you actually selected the last thing that you thought you were hovering over. I can't estimate how much time it saves you because of that. What I can say is that this thing "light screens" a lot less. Revit used to crash on me several times a day on the Dell, but I have very few crashes now. Since I've had this machine, I've only had two Revit crashes which is incredible."

As for being a solution to previous workflow problems, Simon also cites the machine's easy and uncanny compatibility with AV projection systems. According to him, this third aspect is critical since he is often required to present a model on a moment's notice. "Having a very fast, portable machine is extremely important in that regard," he says. "Working at my desk I used to hate it when someone said 'Can you come to the conference room and show us the model?' My answer was always, 'I may be able to. Let me see if I can get this thing fired up. Not anymore.'

In our field offices we have large screen televisions and projection screens for presentation meetings, so I have to be able to link in and get hooked up on that particular system." As the only laptop he uses, Simon spends about twenty percent of his time out of the office. At least one day a week he's either in the conference room presenting something to someone, or at a client presentation, or out in the field running some type of meeting where he must show the model on the screen.

NICE TO DO STUFF

Although he's not privy to any actual benchmarking data, Simon insists that in terms of produc-

tivity, he's getting a lot more "nice to do stuff" accomplished. He defines "nice to do" as either detailing in models or finishing. "You're never really done with a model," he laughs. "You simply run out of time and have to go with it. With the GoBOXX, my models are more detailed and more corrected. I have more time to go back and fix things." He also says that he has more time to grant the constant requests ("Could you sketch this up for me please?") that come his way.

When discussing GoBOXX performance, Simon relays a story about a recent SB Ballard project where they faced some challenges obtaining IFC models from the ductwork and sprinkler system subcontractors. "Their shot drawings were on paper," says Simon, "and with the GoBOXX, it was easy to model those things. With the Dell laptop, it would have been very difficult because the model was extremely large, very specific." Simon points out that SB Ballard will actually model detail items that architects don't. As an example, he refers to glass connections where they (SB Ballard) actually build a 3D model of the connection. "Architects won't do that because they're trying to show design intent—not specifications," says Simon. "We want to look at the specific part and make sure it will fit." Simon adds that often, the mechanical contractor has previously chosen equipment from a manufacturer that doesn't have Revit models, therefore requiring SB Ballard to create them. In these instances, his Dell laptop would quickly bog down under the weight of such large scale models, while his GoBOXX handles them with ease.

"WHEN YOU'RE TRYING TO GET THE JOB, IT'S VERY CUTTHROAT"

Because SB Ballard has earned a reputation as a builder of large scale, high profile projects, Simon's project presentations come with a certain degree of expectation. "In some ways, I think we sort of built a trap for ourselves," he admits. "If we don't walk in with all the bells and whistles, then the client thinks we're giving him short shrift and that we don't really want the job. The level of expectation has definitely increased. Where Timelander video was once sufficient, we now have to have a lot more. We used to go in with simple power point presentations of pdf slides. That just doesn't work anymore. It must be very highly orchestrated. In the bidding process when you're trying to get the job, it's very cutthroat. All those contractors out there have the capability to CM at risk or design build work, and they're competing for these jobs. The majority of contractors

are going after these hard bid jobs and we can't differentiate ourselves in those because it's all about price. Ideally, we need to have a best value environment where we can demonstrate to the owner what we can do and let them know that they're going to get a better product and then they'll want to use us again. That's not something we can communicate in a hard bid. Most quality general contractors are in that quandary."

As for the future of BIM, Simon believes it's firmly on the way back following a period where it seemed to be in somewhat of a decline. He refers to a competitor, a "quality general contractor" that at one time employed a BIM staff of eight, went through layoffs, and is down to one. "A few years ago, BIM's stock was way down," he admits, "but now it's coming back. Owners demand it and it saves money."

Because of all the information it provides in terms of long term maintenance, I compare BIM to "service after the sale," and Simon agrees. "When we give it to most owners, they ask, 'Do we really need this?' he says. "But some demand it. In another two years, they'll all want it and institutional owners are going to want to tie it into the facilities management systems they're buying. That's sort of the next thing we're looking at—going to the 6D lifecycle integrating with facilities management. We just don't have many owners that are terribly interested in that right now, but they're starting to come around and we're ready for them. The biggest factor for us, in order to produce a facilities management solution, is what facilities management software they're going to use. It's still sort of an emerging thing so the standards aren't as strong as they should be."

As our conversation winds down, I ask Phil Simon if SB Ballard considers BOXX a part of their future and he quickly replies that they already need more and as their current machines reach their expiration date, will likely purchase additional GoBOXX systems. "I asked IT for a GoBOXX 2720 and they got me (a top of the line) 2725 because they wanted to give it a try," says Simon. "I'm glad they did. It's a great machine. The performance is absolutely jaw-dropping and I couldn't be happier with it." ■

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The advertisement features the NVIDIA logo at the top left, followed by the slogan "UNMATCHED POWER. UNMATCHED CREATIVE FREEDOM." Below the slogan are two NVIDIA Quadro P-series graphics cards, specifically the P5000 and P6000 models, shown from a perspective angle. The cards are black with green accents and the "QUADRO" brand name. The background is dark with a subtle grid pattern. The text "THE NEW NVIDIA P5000 & P6000" is prominently displayed in large, bold, white and green letters. Below this, in smaller white text, is "powered by NVIDIA's Pascal™ GPU technology." At the bottom, the text "NOW AVAILABLE IN" is followed by the large, bold "BOXX" logo, with "APEXX WORKSTATIONS" in smaller green text underneath. A BOXX APEXX workstation tower is partially visible at the bottom, showing its front panel with various ports and a small screen.



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Certified for Autodesk® and Dassault Systèmes SOLIDWORKS®, CATIA®, and other professional applications, BOXX product design & manufacturing solutions deliver unparalleled power and reliability for the most demanding workflows. For over 19 years, we have earned a reputation as the leading innovator of reliable, high performance solutions that enhance creativity and increase productivity—resulting in increased profits and efficient workflows for our customers.

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BOXX CUSTOMER STORY

BY: JOHN VONDRAK

When presenting VRED automotive design software, Autodesk's James Cronin rides with renderPRO

When I speak to James Cronin, his latest news is that he is back in Detroit, a city you won't find on many "preferred destinations" lists. In fact, most of today's press reports regarding the Motor City read like autopsies, centering on a once great metropolis now fallen on hard times. There's always talk of a resurgence, but it is slow getting underway. Despite all of this, for an industrial designer, car guy, and family man like Cronin, Motown sounds like home. He lived here for over a decade when he studied at the College for Creative Studies, followed by a job (right out of school) at General Motors as an Autodesk Alias modeler. From there, he went to work for Alias Wavefront, traveling to car design studios as a consultant and Alias training provider. His last stop was in San Diego, working for a major Japanese automaker, beginning as a concept modeler and departing as the visualization lead. The father of two children, Cronin likes the idea that he and his family are back in Michigan where his wife grew up and her family still resides. "The summers are great," he adds.

If it sounds like James Cronin is, in effect, getting back to his roots, it's true. It's even more apparent when he describes how good it is to be working again for Autodesk—especially since their acquisition of PI-VR, the German software company and makers of VRED, a series

of software applications that streamline the car manufacturing process through sophisticated, real-time, visualization techniques. Autodesk is integrating VRED technology within its own existing lineup including Showcase, Alias, Maya, and 3ds Max. "For the past nine months, I've been using the world's best visualization tools," says Cronin, "and that's pretty exciting."

VRED Products

- VRED (for product designers) allows users to visualize 3D models on the fly.
- VRED Design (for automotive) enables users to review and evaluate design ideas in real time.
- VRED Professional (for automotive) provides high-end visualization and virtual prototyping to analyze 3D models.

The VRED Advantage

Although VRED users have expanded to include virtual photographers and other industries (in particular kitchen equipment and machinery for factories and manufacturing plants) it is still an automotive-focused visualization tool featuring real-time ray tracing courtesy of a CPU-based ray tracer. And because VRED is CPU-based, it can accommodate large data sets, as opposed

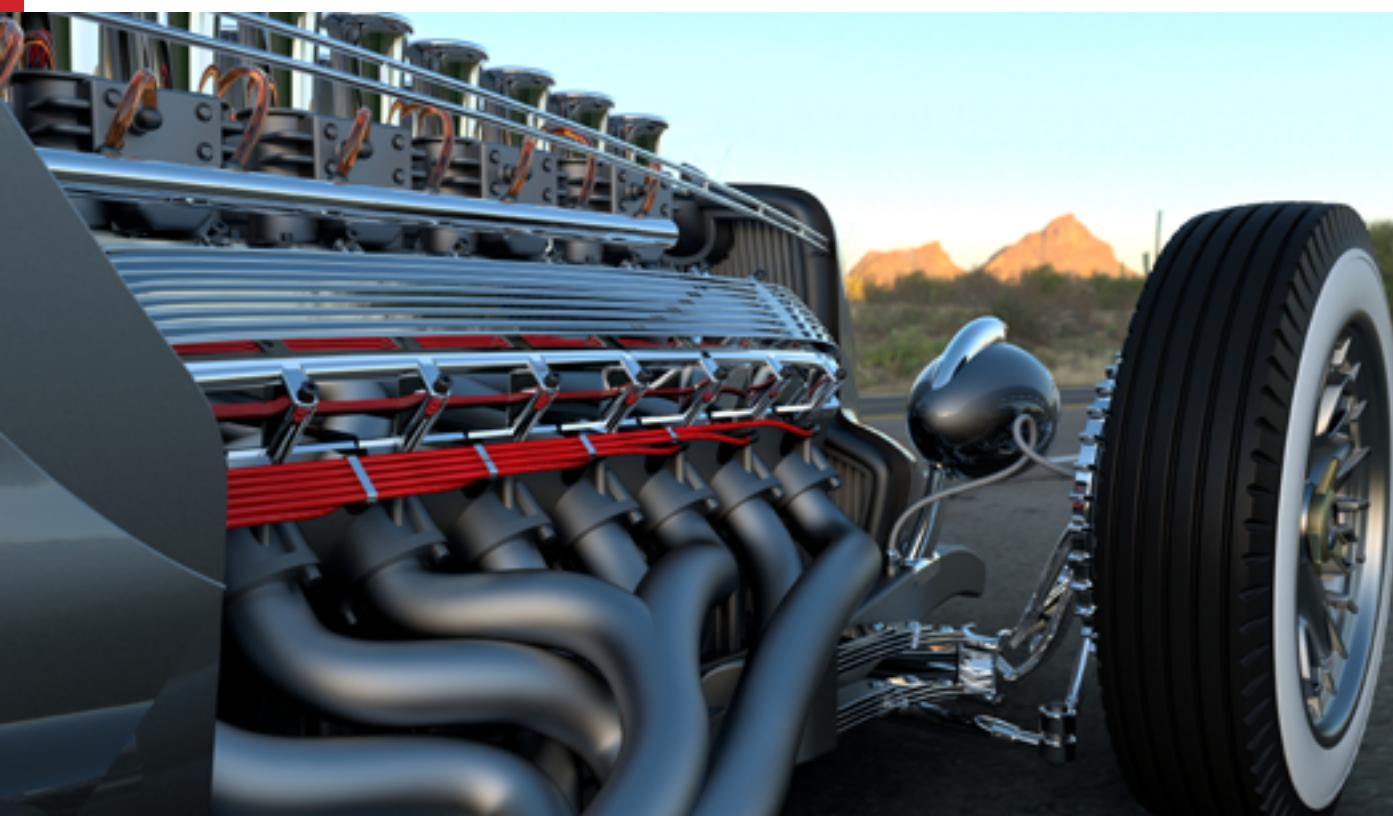
to other visualization software which is GPU-based. “In terms of automotive design, that’s one of its major strengths,” says Cronin. “We can pull in data sets right out of team center as a JT file (the 3D data format used for product visualization, collaboration, and CAD data exchange) and we don’t even have to clean it up. We don’t have to do any backside culling. You just bring it right in, the whole part, and save all that prep time.” This is critical to Cronin since he admits when working in visualization, most of his time is spent preparing data. He sees time savings as the true advantage of VRED.

“I would spend days preparing it so that I could spend one hour painting it up and hitting go for a turntable,” he says. “The benefit of VRED is that you don’t have to spend all that time preparing data. You can bring everything in to render and the ray tracer doesn’t care. You have all that RAM. With the graphics card, you have limited RAM.” But that doesn’t mean VRED, which has its own unique rendering engine, is strictly CPU-based. It can also rely on the GPU for OpenGL rendering. “I met one customer using VRED in an immersive mode,” says Cronin. “It had to be run on a graphics card at that point because they didn’t have a large CPU cluster. It’s performing very well for them—forty million polygon data sets running on a single graphics card in 3D. When it’s in ray trace mode, it’s actually very fast. Comparing it to Showcase running on my laptop, there’s a huge speed increase. When

I installed VRED for the first time and got it running, I was shocked at how much faster it was. I don’t know the actual numbers, but to me, it seemed four times faster than Showcase.”

One of the reasons Autodesk made the decision to acquire PI-VR (and VRED) is because VRED is very much a cross-functional tool with a very broad range of uses, as well as a strong appeal to a certain type of user. “Most would probably fall under the category of a designer that needs to make a marketing level quality rendering and do it quickly,” says Cronin. The reason, he explains, is that throughout the world, the bar has been significantly raised when discussing the turnaround time and quality of rendered images. High fidelity visualization, or experiencing reality as close as possible before a product actually becomes real, is becoming more commonplace thanks to CPU-based rendering capabilities like those found in VRED. As a result, expectations are higher and Cronin admits that senior managers and executives have become more difficult to impress. “Perhaps ten years ago, if an image included reflections, they were blown away by it,” he says. “But now everything has it. Now it’s about how good it looks and how fast you can get there.”

Our discussion also revolves around achieving photorealism earlier in the design process in order to make decisions. Design managers prefer renders be as realistic as possible, alle-





viating confusion in regard as to what has been designed. "The old days of thumbnail sketches with a lot of chalk are really cool," says Cronin, "but back then, an executive could indicate one aspect of the design and ask, 'What is going on back here and you might say 'I haven't figured that out yet. Renderings are able to do that too, of course, but now, just as soon as possible, it's important to get a photorealistic rendering of what the design is going to be because design times have shortened. The sooner you can demonstrate that your design is feasible, the more likely it is to be chosen or you'll get the go ahead sooner."

In other words, decision makers don't have to rely so much on their imagination to fill in the blanks. They can easily see that design A is going to be the next Dodge Ram, Chevy Camaro, or Ford Mustang and say, "Let's do that one." Cronin explains that in the past, there would likely be eight design proposals with six of those selected to move on to the clay model phase. Three of these would then become full-size models, and of those three, one would be selected as the full-size car model. Nowadays, six proposals become two quarter scale models, followed by one full-size model. "One of the reasons the design schedule has been reduced is because they're making the early ones so much more accurate," says Cronin. "They have everything, like the ability to scan and mill right on the plate. In the old days, it was drag-

ging templates and mirroring the car by hand in the clay. So it's not just the digital process, the physical processes have sped up too. They've figured out a way to make everything faster and more streamlined."

In addition to rendering, VRED Design and Professional are also instrumental for processes like validation and verification. For example, engineers may want to know what a particular headlight is going to look like in bright noonday sun. They may also want to see how that same light will look in a lit condition or how much light the LEDs are emitting. "These engineers don't care about making a picture or rendering it," says Cronin. "They just want to look at it for validation or to see what these interior parts look like when they are all together. In other words, how do they line up?"

VRED Professional also includes engineering tools like surface analysis and gap measurement, enabling carmakers to take a look at a virtual prototype of the auto body and determine if the surfaces were built correctly. This means they don't have to build an actual, physical prototype of the car body and send it to surface analysis. Within VRED, they can accomplish some steps of the surface analysis process, saving both time and money.

For Cronin, one of the most unique VRED Professional features is its ability to ray trace the

NURBS data so there is no tessellation—extremely critical in regard to lighting and reflection. “For a lighting simulation person, a half of a degree makes a huge difference on how a reflection or light actually bounces,” he explains. “The level of tessellation can affect the results, so if you’re using purely NURBS data and not tessellation at all, you don’t see the tessellation when you zoom in. It’s perfectly smooth.” Another benefit of VRED is that users of other Autodesk applications can easily bring those 3D formats into VRED and go to work.



On the Go with renderPRO

Though officially designated as a member of the Autodesk sales team, Cronin is actually the subject matter expert for automotive design, focusing on Alias and visualization. Most often, he splits his time between the Big Three automakers, accompanying sales personnel. “I go in and demo Alias, demo VRED, and answer questions,” he explains. “I do a lot of support as well since I’m on site so much. I get asked the instant question instead of customers putting a call into support.”

It was at Cronin’s last job (the aforementioned Japanese automaker) where he first became acquainted with BOXX Technologies by way of the four GPU 3DBOXX 8550 XTREME that sat on his desk. But now, in his new role as a demo expert, he travels with a 17” laptop manufactured by a tier one company. However, when Cronin needs to demonstrate detailed lighting, or any of the other features found in VRED, he brings along a BOXX renderPRO, the compact, dedicated rendering module featuring dual Intel® Xeon® processors and solid state drives. “It gives me workstation power without having

to lug my workstation around,” he explains.

When Autodesk first acquired PI-VR and Cronin started working with VRED, he quickly learned that his laptop was woefully insufficient for demonstrating the software’s potential. Because of his previous experience with BOXX, Cronin went in search of a demo solution and discovered renderPRO. “I was able to convince my boss to get me one, along with a nice little Pelican rolling case,” says Cronin. “Before, whenever I had to take my workstation, I’d also have to bring a monitor, a carry cart, and all that. It was a cumbersome process. But renderPRO is compact and easy to transport—and it’s even faster than my workstation!”

The speed of renderPRO is also critical since demonstrations require providing a wealth of information in a short amount of time. “When you’re presenting, you don’t have a lot of time,” says Cronin. “No one wants to sit and watch a full global illumination with photon map gather to one hundred percent. They want you to go on to the next thing. You have limited time to show off, so that’s where other guys have to lug the workstation in and say this is what you will get with your nice workstation. I just bring my laptop and renderPRO.”

VRED Design and Professional cluster very easily (they feature an offline and online cluster module) so for real-time ray tracing, while Cronin is interacting with the software, he can render frames for still images. When presenting, the real-time window on his laptop uses the renderPRO to power the ray trace, so he’s able to get very high-performance on the laptop without actually relying on it. “It’s great since I don’t know of any laptops out there with 32 cores or dual Xeons,” he laughs.

Was Cronin surprised the first time he used the renderPRO?

“Yes, it was so nice to see the status bar inside of VRED,” he recalls. Where it used to read eight cores, it now said forty. It added 32 cores! Usually, when you’re demonstrating high end, full global illumination, you rotate the vehicle and then wait for all the ray tracing to gather. With renderPRO, it’s nice to see it gather at an exponentially faster rate. It’s all about time to image. How fast can I get the best looking image with-

out making mistakes? You need fast results and renderPRO allows you to make the right choice sooner."

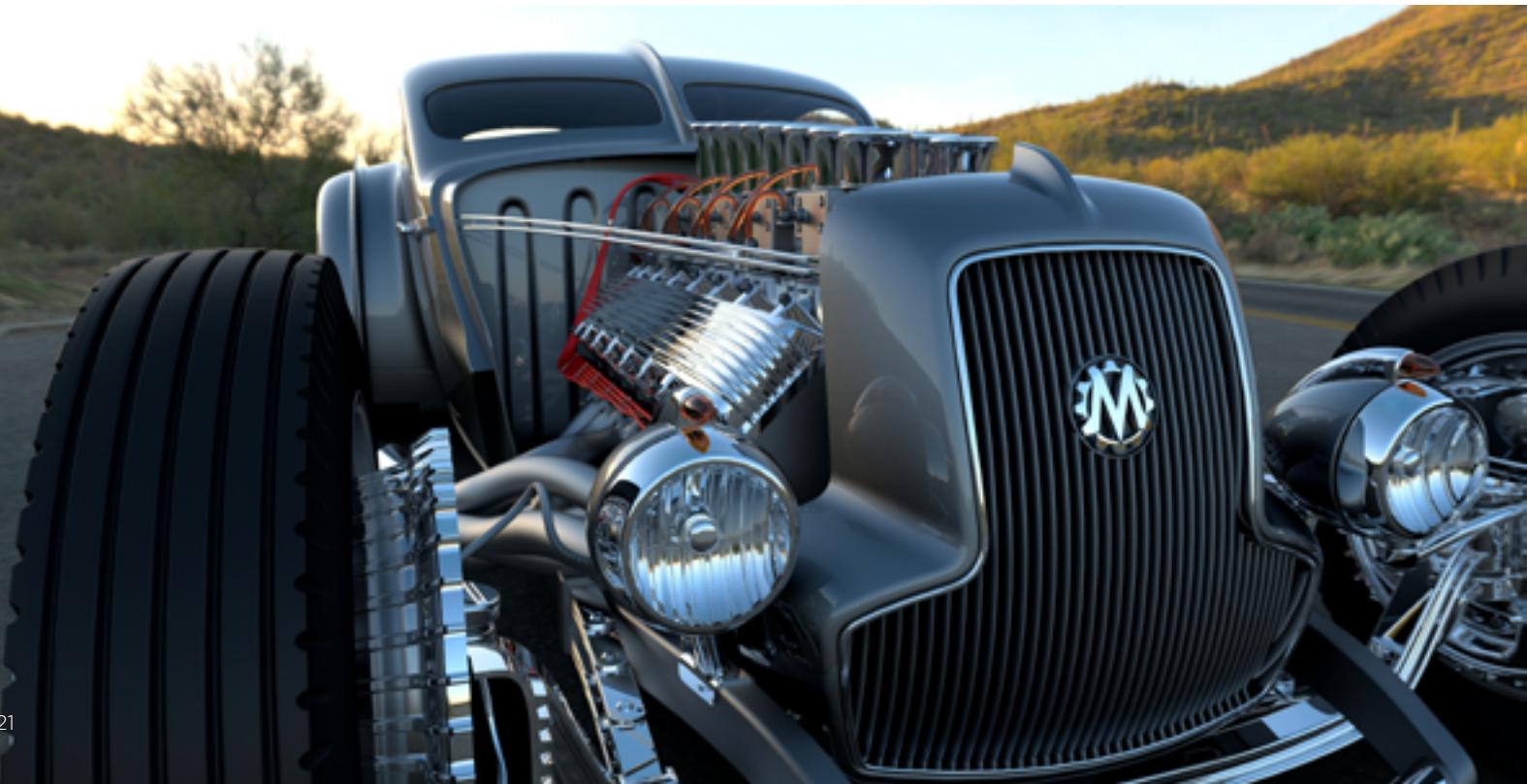
Cronin explains that one of VRED Professional's strongest attributes is its ability to create simulation quality lighting imagery. "It's like simulation level," he says. "It's not a simulation tool like some of the other ones that actually are, but it's very accurate and I know the VRED team has conducted tests with actual production lighting and its 95-98%."

However, in order to reach that level of realistic lighting, the calculations on the simulation (full global illumination, photon mapping, etc.) require a good bit of time. "You need it to proceed quickly," says Cronin. "You don't want everyone sitting there waiting and thinking 'Is this going to happen soon? You just want to rotate around and hear everyone say 'Oooh. You can't have awkward pauses. That's why renderPRO is such an important demonstration tool. The companies I conduct presentations for have high end workstations, so you want to demo with hardware that is similar to what they have on their desks."

As much as Cronin appreciates the power and performance of renderPRO, he loves to talk about its mobility as well. "Sometimes I go to trade shows," he explains, "and standing on the

show floor I want to be able to show off this high end software, but we just have our laptops. It's great to be able to throw the renderPRO in the little cabinet under the table and then I'm networked right into it. It works really well and, once again, I'm not forced to cart all that equipment to and from the show. If I'm traveling to California for a trade show and I call Autodesk and ask "will you have high end workstations for me to work off of with all the software loaded, usually the answer is no. You have to bring your laptop and that's another reason why renderPRO is so perfect. I can bring it with me and stow it in the overhead compartment on the flight."

According to Cronin, renderPRO's mobility also makes it ideal for working from home. "When I'm at home, I'm able to cluster my workstation with the render pro," he says. "Now I have the power of two workstations without actually having to own two workstations. It's also a smaller footprint on my desk and I'm not spending extra money on a graphics card and everything else that goes into a second workstation. At my old job, I had two workstations on my desk and when you start getting to the point where you need more rendering power you ask yourself if maybe you need a third workstation. You start to wonder what you're going to do, where is your monitor going to go? renderPRO sits right on top of my workstation and easily

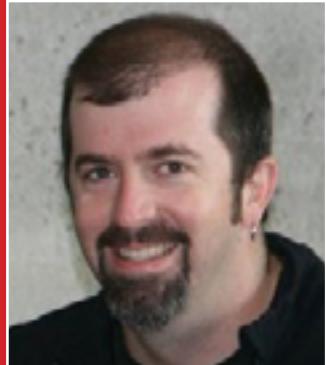


ties right into it—small footprint and quiet too.”

Cronin also likes the fact that if you’re working for a large company, renderPRO is an easier sales pitch to management and IT departments. “I don’t have the restriction of going through IT personnel to install this,” he says. “At my former job, hardware decisions came down to the corporate standard equipment. They were buying for people that were doing Powerpoint or Microsoft Word, assuming that that one particular workstation would work across the whole spectrum of 10,000 employees. But when you’re doing high-end design of any kind, you know you need professional workstation performance, including the right graphics cards. Unfortunately, when you start talking about that, you’re doubling the price. If you get a high-end workstation with dual CPUs and an NVIDIA Quadro K5000, you could end up with a machine on your desktop that costs \$15,000. With renderPRO, it’s a lot easier to say that all I need is this one small cluster unit for a fraction of the price and I’ll be doubling my speed. It’s also easier to justify by saying that you have to render this many frames by next week and that you’ll be sitting here watching your computer do nothing but render for the next ten days or you can knock it out in four days. Speed and performance return your time back to you and that is the most expensive time for a company. You don’t want your users just watching a status bar.”

I remind Cronin that at BOXX, we often hear that our systems are expensive or that a particular company, though impressed with BOXX performance, is already entrenched with a mass-produced computer manufacturer. Cronin’s response is simple: “If you’re kicking off a giant animation on Friday, when you walk in Monday, you want to know that it finished on Saturday afternoon. My argument is always this: ‘What’s more expensive—someone sitting on their hands doing nothing or faster frame rates that equal greater productivity?’”

His logic makes perfect sense: save time, save money, increase productivity, increase profits. And since there are no substitutes for creativity, hard work, and common sense, if Detroit can hasten the return of more individuals like James Cronin, while retaining the like-minded souls who already reside there, perhaps the Motor City resurgence will get underway after all. ■



James Cronin has been an Alias Subject Matter Expert with Autodesk since July 2012. As a Subject Matter Expert, James's duties include helping customers by understanding their business issues and finding solutions that solve their challenges. James has over 14 years of experience in the Automotive Design Industry.

Prior to joining Autodesk, James was the Visualization Lead at Nissan Design America. Before Nissan, James was a consultant with Alias|Wavefront, where he worked on-site at many OEMs including GM, Ford, Chrysler, Honda, Mercedes and Hyundai. James graduated with honors from College for Creative Studies with a BA in Industrial



 AUTODESK.

The Autodesk logo consists of a blue and green geometric icon followed by the word "AUTODESK" in a bold, black, sans-serif font.



BOXX CUSTOMER
STORY

BY: JOHN VONDRAK

In a candid interview, Orange County Choppers senior designer Jason Pohl and media & marketing advisor Jim Kerr cut up and cut loose on the business, their workflows, and why the world's most famous custom motorcycle shop is thrilled to be back with BOXX.

WELCOME BACK O



CHOPPERS





BOXX: So how are you guys enjoying your BOXX APEXX workstations and renderPRO?

Jason: These new machines are the cat's pajamas, man!

BOXX: I'm going to quote you on that.

Jason: It's ridiculous! I recently did a render that took about a minute and ten seconds and that same render took 47 minutes on the HP. Using V-Ray is awesome. We went ahead and got the renderPRO so both machines render at the same time in (Autodesk) 3ds Max—forty processors jamming along, man. I remember in high school, I had two processors that were overclocked and now I have forty. I find myself talking about it to random people at the grocery store:

"So I have forty processors now."

"You talkin' to me?"

"No I'm talking to the broccoli."

BOXX: Be careful—that could get you committed to an institution.

Jason: When we finally got all those buckets to start rendering in V-Ray, 3ds Max, it was ridiculous (followed by a solid impersonation of a heavenly choir of angels). It was like light shining through the building onto the computer. It was pretty ridiculous.

Jim: It was beautiful.

BOXX: So you guys were using HP before?

Jason: Yes and that's slang for Hewlett Packard.

BOXX: I see. What model?

Jason: Z800. At the time, it was a beast—six years ago. It's met its match. It's been formatted and rebuilt a couple of times. A couple of graphics cards went into it. I've burned through two (NVIDIA) Quadro K5500s. It had heat issues, man. Heat just kills electronics. It's already 97.8 degrees in our office here.

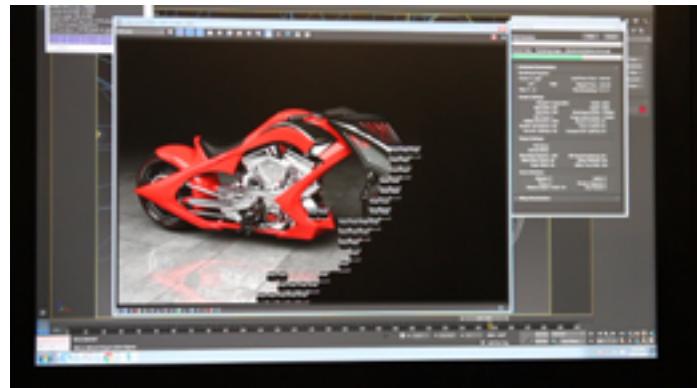
BOXX: So you must love the liquid-cooling in your new APEXX.

Jason: Oh yeah and it's so quiet.

BOXX: What's the biggest difference between it and the HP?

Jason: Render speed, man!

BOXX: That's what it all comes down to, doesn't it?



Jason demonstrates 40-core processing with APEXX 1 & renderPRO



Jason: Yes—that and the reboot time is amazing. I think that has a lot to do with the SATA drive. Towards the end, the HP was taking fifteen minutes to reboot. Rebooting the BOXX is under two minutes. The APEXX is adorable too. Cute as a button. I read to it at night—a children's book of some sort.

BOXX: (laughs) In terms of your workflow, is that the biggest problem the APEXX 1 has solved—that now you're working faster, you're more productive?

Jason: It's just an animal, man. It's a machine. What's cool is that instead of doing a single image rendering to show our clients what their bike could look like, we're now able to render out a scene with camera fly throughs. I can zip it across the bike and see it all the way around. Before, I'd render three or four different views—the front, back, and sides. I still do that, but it's so much cooler to send them a link and tell them to check out the animation. They see their bikes spinning around with that virtual camera and it really gets them going. It's cool because it lets us show our client exactly what we're doing. They can share in the vision. If they want to see something different, or say "Hey let's do this or that," I'm able to change it quickly and re-render it. So what used to take an entire weekend (and I remember I did that on the dragon bike—a simple 300 frame pan of the bike and it took an entire weekend) now with distributed rendering and both machines cranking away, will be waiting for me. It's done tomorrow if not by the end of the day.

BOXX: So in concrete terms, you're looking at a job and you say this used to take x amount of time to complete but now, that same type of job you're done in what, half the time?

Jason: John, the biggest thing is . . . say I do want to render a scene. Now I can do a production render on that bike and keep working on the APEXX 1. The renderPRO is going full power, but I can keep working on the APEXX whereas before, I'd get the render scene all set up, I'd be working with Paul (owner Paul Teutul, Sr.) on the project, and he's saying (imitates Paul's gruff voice) "What are you doing?" and I'd say, "I've got to render out." Then he would say "Ohhhh, okay." And literally, I would hit the render out button and it would just bog down the entire computer. I couldn't use any other application. I couldn't even check email. Paul could say "What about that contract, or this or that?" and I'd have to tell him, "I can't access it because I've already started a rendering and I can't kill it because I can't pick it back up from that same spot." So whenever I had to render something, which was at least once a week since I've got to create a design, it would stifle the workflow on my computer so badly that I couldn't do anything else. I was just paralyzed, so I would think, "Well I guess I'll just go out in the shop, get coffee, do some cleaning, go get the vacuum." Without that render time, it's like Paul gained another employee because the renderPRO just keeps going, keeps rendering, and doesn't stop. That's huge! To be able to assign a job to the renderPRO and then to move on and do something else I need to work on is incredible power. I feel really stupid for not calling BOXX sooner.

BOXX: In your defense, you have been kind of busy, right?

Jason: It's been busy but . . . I don't know, HP was great back in the day. Paul did a Super Bowl commercial with them and on the TV show, they offered

everything we needed to get that going. Time and place. Now, I just wish we had done this sooner.

BOXX: What was it like, trying to make deadlines, before your BOXX systems?

Jason: Here's the deal. We're working on this client's bike and were jammed up. We have another bike due and we have to get this approved before the entire team can start working on it. I would get a rendering going and I always tried to plan it so it would jam out over lunch and there wouldn't be computer downtime. What would happen is I would come in, check the rendering and I'd think, (in an agonized voice) "Oh man, this took two and a half hours and I've got chrome, and ray tracing and this and that, kung fu fighting, and I look back and there's one brake caliper I forgot to put the green material on so its chrome. Or maybe the one gas tank, because its split in half, is a slightly different color than the other because I didn't assign something right! Basically, I would mess something up and it would inert the whole project. At that point, what I would do to save time and not have to do a whole hour and a half re-render, is render just that brake caliper and bring it into (Adobe) Photoshop, pack it in there and try to make it look right. I don't miss that.



BOXX: Jim, how does your BOXX workstation differ from what you were using before?

Jim: Night and day. I wasn't as fortunate as Jason. The CPU I was using when I got here was really bad; I mean it would take days to download five photos. It was extremely painful. It was an HP too and it had been passed around through a couple of people before it got to me, so it already had a lot of internal damage done to it. Going to the BOXX, I'm using the APEXX 2, and it's just incredible. The downloads, uploads, everything just flies. No rendering time like Jason has with his bike designs. For me to render or do anything in Premiere Pro just takes seconds to build the images and video out where I can go back and view them and make more edits. A night and day difference.

BOXX: How much time has it saved?

Jim: I'm going to say seven.

BOXX: Seven?

Jim: Oh, I was just giving you a number.

BOXX: That's okay. I have you on tape so that's on the record.



Jim: Seriously, I'll bet you I save a good day a week, definitely.

BOXX: Really?

Jim: Oh yeah. And I do a lot of AIs for social media, so I have a lot of software that runs in the background doing stuff for me. It doesn't bog down at all with any of that. Just yesterday, I did a live stream from here and it was crystal clear using the BOXX. I was using the new Logitech C920 4K webcam and a Realtech shotgun plugged right into the APEXX 2 mic jack. It just worked phenomenally.

BOXX: Has there been a deadline you made with the APEXX 2 that you would never have made using the HP?

Jim: It's the same thing Jason goes through. Paul or someone else will come in here looking for something and we have to knock it out. One example was a video Jason and I shot it in the morning and we had to have it to a very high profile client by lunchtime. There was a lot of footage, a lot of different takes, different angles, and we had to chop it up and get it in high quality. We didn't want to give him anything that didn't best represent him, Paul, or OCC. If we had to do that on our old HPs, we definitely would have failed.

BOXX: Jason, what's your creative process and workflow like? Does it differ from project to project? What applications do you rely on?

Jason: It's always different because each project is severely different. The workflow that I like is doing a lot of the engineering and modeling in Autodesk Fusion 360—anything that's hard numbers and things like that. For organic stuff like a dragon head, gas tank, or anything really super smooth or creative if you will, I use 3ds Max 2016. Everything ends up going inside Max when I do an assembly because it's the quickest. I just import an FTL from Fusion and start rocking and rolling and putting things together. That's where I build the bike—in 3ds Max. I use V-Ray 3.3 to render it out. From there, I'll hopefully get a nice looking bike and then bring it into Photoshop and add some accents. Sometimes, paint schemes in Photoshop come a little bit easier than in 3ds Max. Finally, I create a spec sheet to accompany the bike design. That's my workflow. I sketch in Photoshop and Autodesk Book Pro as well.



Jason does a quick sketch of the BOXX bike.

BOXX: Do you ever create any video or animation?

Jason: I used to, but now with Jim here, he does that along with logos, special effects, and king foo fighting as well.

BOXX: Tell me about your workflow, Jim.

Jim: I do all the photography and in-house video. I use the APEXX 2 to download all the still footage from the cameras and video. They come from a couple of different sources, so there are all different formats.

BOXX: What kind of camera gear are you using?

Jim: Everything from Canon DSLRs to their (Canon) XC10 4K (camcorder), Panasonics, Sony—we have something from everybody here. My primaries are going to be the DSLRs and the XC10.

BOXX: What happens once you bring it into the computer?

Jim: I do some archiving and put it into separate folders—basically cataloging it. Then I bring it into Adobe CC.

I use pretty much everything in Adobe: Photoshop, Lightbox, After Effects, and then edit with Premiere Pro. I'll come up with a final still image to use on social media or posters and marketing, or chop up the videos and get those out to whatever platform we're using them for.

BOXX: Were you aware of BOXX prior to joining OCC?

Jim: No, I've just been here a little over two years now, so my intro to BOXX was just this past sequence we're working on now. Now I'm preaching BOXX to anyone who will listen. Your stuff is phenomenal. It blows everything else out of the water.

BOXX: What were you doing before OCC?

Jim: Twenty four and a half years in the (United States) Air Force. I retired from there and went on to do marketing, media, and social media for Gold's Gym. Then I was offered a job here.

BOXX: Do you like it?

Jim: Yeah, it's a great gig, I get up every morning and come to a place where I like working. It's different every day. I never know what I'm going to get when I walk in, what's going to be asked of me, and that's great.

BOXX: Tell me about yourself, Jason. What's your bio prior to Orange County Choppers?

Jason: I went to the Illinois institute of Art in Schaumburg. From there, I worked at Incredible Technologies, Golden Tee Golf and now OCC. I've been working with Paul for twelve years.

BOXX: How did you become aware of BOXX? Was it from our past relationship with OCC?

Jason: I can't say his name, but I'm going to try. Ed Caparerorera

BOXX: Ed Caracappa (former BOXX Director of Business Development, currently Sr. Director of Business Development at Avid Technology).

Jason: Yes! So I called BOXX years ago, spoke to Ed and he set me up right away. You guys ended up getting the chrome-framed chopper that we did for SIGGRAPH in LA, did that whole song and dance. It was a great time.



BOXX: So how did you become an HP shop? What did we do wrong?

Jason: You guys did nothing wrong! It was really that we were a victim of product placement and Nielsen ratings. The big cats came in, they meowed, and we had to deal with it. It was cool. There were a handful of guys over there at HP, at the workstation level, that really took care of me. Six years ago, it was a custom Z800, it wasn't an off-the-shelf type thing. I had 24 gigs DDR of RAM which was insane at the time (laughs), the GeForce card, the Intel Xeon. We even built a bike for Intel back in the day and it helped for that relationship with HP. It's kind of how that was introduced actually. Intel's was a quad core chopper and had two V-twins in it. They were promoting their quad core processors. We also did one for Go Daddy.

For interview and demonstration videos plus more great photos, check out the OCC Customer Story on BOXX.com.

BOXX: I remember that episode.

Jason: That was back in the television heyday. Those were good times.

BOXX: Have you ever relied on BOXX Technical Support?

Jason: Oh yeah, I know Wil, Jesse, and some other guys.

BOXX: Take me through that. What happened?

Jason: I called them up a handful of times and said, "What the hell did you send me?" Where does this go and that go. . . (laughs). Actually, they got the APEXX talking to the renderPRO. They were great. No problems, it's been running really cool, really fluid, and really smooth. It likes a restart every other day—reboot the cache, the software, but that's fine. Takes two minutes and it's healthy for me because I always have so many things open and so many projects going on it reboots my mind too. Jim has a good tech story for you.

Jim: I had the BOXX maybe a couple of weeks to a month and the video card died, so I started losing one monitor and the next and the next, so I did the trouble shooting myself, replugged, rebooted, all that good stuff, but it just got worse, so I called BOXX Tech Support and the next day they had a tech out here with parts. He was here for maybe twenty minutes, replaced the card, got everything fired up and working, and I've had no problems since. BOXX Tech Support was outstanding.

BOXX: Jason, how many hours straight are you going on the new APEXX?

Jason: Eight or nine. But you know, I got into other stuff here. I've been painting, working on the price structure of the bikes, and I'll have a cell open doing the parts pricing for all the bikes, so it's a multitasking machine. I'm not just an animator working on the same scene where you get in a zone and just keep jamming along on the same kind of path. It's totally different. We're always evolving and moving, but as bike design goes, we try to start on paper first

BOXX: What percentage of your work consists of customers requesting specific designs and how much is you creating bikes on your own?

Jason: For the customer driven: about a handful of them come in and say, "I want a bike and here's our brand." Then they put the Windex bottle (for example) on the table and say, "Rock & roll—go to work." That's cool—it's great. Then there are the guys who say, "I want my kid's name airbrushed on the gas tank," and I say, "Okay." Then there are the really unusual ones like Wild Game Innovations. They wanted a giant skull of a European elk and I said, "Nah, we can't do that. It's too dangerous." But they insisted, so we did it—the whole thing in 3ds Max and rendered it out. And when they saw it they said, "Yes!" Then our insanely talented machine shop, Jim Quinn and Mike Tampone machined all thirteen organic pieces, bolted and welded them together, and blended out this giant aluminum elk skull. Elk skulls are huge. They're six feet and they put that on the bike and welded it to the frame.

BOXX: I thought this was going to be a cautionary tale where at the end you say the guy ended up impaling himself on the antlers.

Jason: (laughs). I was actually on the bike at a trade show in Louisville where, behind the curtain, the show floor was really dusty and I almost dumped it.

BOXX: That would be a bad day on the job. Switching gears, are there any other BOXX products you have your eye on? GoBOXX, maybe?

Jason: Definitely down the road because I could see a purpose for that. We really need to upgrade our monitors around here, so that's probably next on the list. Webcams as well. Also, you guys have been after me to try this Teradici business. What is that—like a lasagna with cheese or something?

BOXX: (laughs) PCoIP technology for remote access. It's terrific. We get a lot of great feedback from our customers who use it. You should try it.

Jason: Your product marketing manager says Teradici works a lot faster than what we're currently using, so I might look into that next.

BOXX: How many hours per week has BOXX saved you?

Jason: I'll agree to any number you say.

BOXX: (laughs) Then I'll say three days a week. I'm a marketing guy.

Jason: (laughs) Maybe we should just reenact the scene from Office Space where they take the old printer out in the field. We could do that for you with our old systems. We were real close to doing that right before we got the new BOXX machines, so it might just happen.

Jim: Seriously, you have a great product and we're excited to be working with you guys, the projects we have going on now, and what we're going to knock out in the future. BOXX allows me to meet all of my challenges and put out the quality of work I expect from myself and others. ■



For interview and demonstration videos plus more great photos, check out the OCC Customer Story on BOXX.com.



“Yeah, I'm really happy to be back with BOXX and we're going to make this relationship last a lot longer than the last one. I'm really thrilled with the speed of the APEXX 1 and the renderPRO too. It's just freedom. It allows us so much more freedom. I'm not sweating over the computer, waiting for it. It waits for me, which is how it should be. I'm just thrilled to be back in the swing of things.

n

- Jason Pohl

WHEN TIME IS MONEY, BOTTLENECKS MATTER.

High clock
speeds for
3D modeling
& design

Multiple cores
for rendering &
simulation



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BOXX



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Featuring overclocked Intel® Core™ i7 processors and professional GPUs, compact APEXX workstations provide the ultimate performance for CAD design, 3D modeling, animation, and more, while renderPRO, the world's only personal, desk-side rendering & simulation solution, enables you to move computationally intensive tasks to a render node—without the cost and complexity of a render farm. Save time and save money when you create at the APEXX and render on the PRO. Welcome to the BOXX Workflow.

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**APEXX 2**

Currently reviewed as the fastest SOLIDWORKS workstation currently on the market

ADVANCING SPECIALIZED COMPUTER WORKSTATION DEVELOPMENT WITH SOLIDWORKS PREMIUM

BOXX Technologies, Inc. manufactures specialized workstations and rendering systems for visual effects (VFX), film, television, game development, architecture, engineering, product design, simulation, higher education, government, defense, science, medical, and general business industries. BOXX workstations continually beat the competition in speed and reliability, and the company's overclocked APEXX series workstations are the fastest single-socket workstations on the market, providing the ideal solution for frequency-bound CAD applications. For multithreaded tasks like rendering and simulation, BOXX has a full line of dual Intel® Xeon® workstations and rendering solutions.

With its industry-leading expertise in hardware requirements for modern render farms and simulation clusters—backed up with comprehensive lab benchmarking of various software applications to ensure optimum performance—BOXX focuses on developing systems that push the limits of what computer workstations can do. According to Founder and Vice President

Challenge:

Accelerate the development of powerful computer workstations and rendering systems to meet the specialized needs of media, engineering, medical, and business customers.

Solution:

Implement SOLIDWORKS Premium design software.

Benefits:

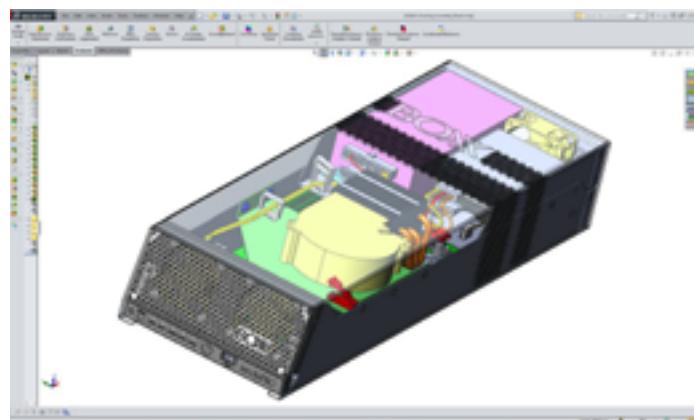
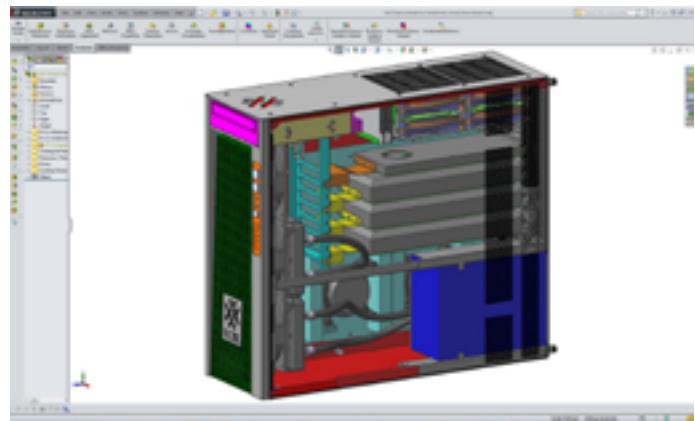
- Cut development time by more than half
- Reduced sheet metal fabrication time by 50 percent
- Eliminated iterative prototyping cycles
- Supported year-over-year business growth of 40 percent

of Engineering and Operations Tim Lawrence, BOXX needed a 3D design platform to advance development of the custom chassis and enclosure designs required for its systems.

"We started out using AutoCAD® 2D design tools," Lawrence recalls. "While 2D initially allowed us to get the job done, it was difficult, slow, and costly to develop systems in 2D. We foresaw challenges as we continued to develop and advance our technology—including sheet metal fabrication; design branding; advanced cooling systems development; unique shipping requirements; and electromagnetic shielding, safety, and international certifications—that we could better tackle in 3D. As a systems manufacturer, we need to continually develop custom chassis and enclosures that not only embody our brand but also satisfy a range of requirements that are unique to high-performance systems."

BOXX consulted with manufacturing partners before standardizing on SOLIDWORKS® Premium design software. The systems manufacturer implemented SOLIDWORKS software in 2004 because it's easier to learn and use, provides robust sheet metal and simulation capabilities, and supports both industrial design and mechanical engineering.

"We asked our sheet metal fabricators about the 3D CAD systems used by their customers," Lawrence recalls. "While they mentioned Pro/ENGINEER® and SOLIDWORKS software as the systems they saw most often, they also indicated that SOLIDWORKS software was easier to learn and use, and was trending upward in terms of popularity. I sat down with SOLIDWORKS software, was able to design right away, and decided to utilize SOLIDWORKS software for chassis and enclosure development."



Using SOLIDWORKS Premium sheet metal design tools, BOXX can more quickly deliver production information—including bend radii and tolerances—which accelerates sheet metal fabrication while improving quality.

DESIGNING MORE SOPHISTICATED SYSTEMS IN HALF THE TIME

Since implementing SOLIDWORKS Premium software, BOXX has realized dramatic reductions in the length of its development cycles, while simultaneously increasing system complexity, improving quality, and boosting performance. "SOLIDWORKS software has enabled us to cut our development process by more than half," Lawrence stresses.

"We're saving on both time and resources using SOLIDWORKS software," Lawrence continues. "It used to take two to three people about 15 weeks to develop a system in 2D. With SOLIDWORKS software, I can complete a system by myself in four or five weeks. In addition to these efficiency gains, we ultimately end up with a better design."



"With SOLIDWORKS® software, we've introduced design features that provide the reliable performance that our customers need..."

Tim Lawrence
Founder & V. President of Engineering and Operations

ACCELERATING SHEET METAL FABRICATION, REDUCING PROTOTYPES

BOXX has seen faster production cycles and a reduction in prototyping requirements since moving to SOLIDWORKS software. Using the software's sheet metal design tools, BOXX can more quickly deliver production information—including bend radii and tolerances—which accelerates sheet metal fabrication. With SOLIDWORKS Premium software's collision detection and integrated simulation capabilities, the systems manufacturer has eliminated the iterative prototyping cycles that were a necessity in 2D.

"Our sheet metal fabrication time has decreased by 50 percent, and we have fewer production issues because SOLIDWORKS software helps us to be more accurate," Lawrence notes. "With increased accuracy, we've eliminated the iterative prototyping cycles that were a fact of life in 2D and can go straight to production. With SOLIDWORKS software, we can identify and resolve potential issues during design instead of relying on physical prototyping."

IMPROVING QUALITY AND PERFORMANCE DRIVES GROWTH

Using SOLIDWORKS Premium software, BOXX has continually improved the quality and performance of its systems, which has allowed the company to enjoy year-over-year business growth of 40 percent. "To provide the functionality and performance that our customers demand, we design systems that utilize the fastest and most powerful components, which also run at higher temperatures," Lawrence explains.

"With SOLIDWORKS software, we've introduced design features that provide the reliable performance that our customers need, such as liquid cooling systems, filtered air, multi-GPU capability, and optimization of the pitch of fins on heat sinks," Lawrence adds. "SOLIDWORKS software lets us be more agile, flexible, and innovative. From an engineering standpoint, we couldn't do what we do today without SOLIDWORKS software." ■

Read more about SOLIDWORKS solutions online at boxx.com.



BOXX INTRODUCES THE FIRST OVERCLOCKED VDI SOLUTION ON THE MARKET

BOXX XDI solutions offer a unique scale-out approach to VDI which are engineering and optimized to maximize CAD productivity. For the first time ever, IT groups and end users can exploit all the benefits of Virtual Desktop Infrastructure, without sacrificing the performance and productivity of content creators using graphics intense 3D applications. Competing VDI solutions rely on low frequency Intel® Xeon® processors which limit CAD productivity. The **Pro VDI 8401R-V** uses an overclocked Intel® Core™ i7 processor which enables bare metal workstation performance in a virtual environment.



ProVDI 8401R-V

Read more about Pro VDI™ solutions at www.boxx.com/XDI.



MEDIA AND ENTERTAINMENT

From our inception, BOXX has earned a reputation for building state-of-the-art solutions for media & entertainment industry applications like Autodesk® 3ds Max®, and Maya®, as well as V-Ray®, Octane Render, and many more.

For over 19 years, we have earned a reputation as the leading innovator of reliable, high performance solutions that enhance creativity and increase productivity, resulting in increased profits and efficient workflows for our customers.

The workstation marketplace consists mostly of hardware manufacturers that rely on a “one size fits all” approach. BOXX is just the opposite. We specialize in the professional visualization and CAD markets, providing cool, quiet, record-setting solutions tailored to meet your specific workflow needs. We’re the workstation equivalent of a custom shop, building hot rods that will take your applications and workflow faster and farther than ever before. How fast do you want to go?

BOXX Customers



CENTRAL



TEAGUE

zimmerman

A photograph showing two men in a studio environment. One man, seen from behind, has a tattoo on his upper arm that reads "LIVE LIFE". He is leaning over a desk, working on a computer with multiple monitors displaying video editing software. Another man is visible in the background, also working at a computer. The studio is filled with equipment and has a professional atmosphere.

MY ACTIVE STUDIO

BOXX CUSTOMER STORY
BY: JOHN VONDRAK

Steve Choo's boutique design, VFX, and animation studio, **My Active Driveway**, goes big with BOXX, creating national commercials for high profile clients.

Awhile back, BOXX Technologies' Inside Sales Manager Dustin Leifheit approached me regarding a customer named Steve Choo. "He has a company called My Active Driveway," Dustin said, "and I think it would make a great customer story." Dustin, like all of our performance specialists, occasionally feeds me the names of BOXX customers (or BOXXers as we like to refer to them) that other BOXXers, and those who wish to be BOXXers, may enjoy learning about. Since we try to alternate our customer story subjects to equally represent our different industry segments I'll confess

that my response to Dustin's suggestion was decidedly lackluster. I had just completed an architecture/construction customer story and was not keen to immediately follow it with another. "I just wrapped an AEC story," I said, "so I may hold off on this one for awhile."

"It's a VFX and animation studio in New York," Dustin replied. I was having trouble reconciling the name My Active Driveway. It sounded as if they were into concrete, building driveways or roads. "Interesting name, I know," he smiled.

So, when I first reached the perpetually busy Steve Choo, my first question was obvious. “What’s with the name?” I inquired. After first insisting that it was “really not a great story,” he relented. “When I first moved to New York,” Choo said, “I was trying to go to a friend of mine’s art gallery opening. I was driving around the Lower East Side just looking and looking for a parking space and every time I thought I had found one, there was a ‘No Parking: Active Driveway’ sign there. So I said to myself, one of these days, if I ever open my own company, I’m going to have my own active driveway.”

Making a Go

Steve Choo arrived in the Big Apple right after graduating with a BFA in painting from the Kansas City Art Institute. He went to work as a Flame artist, then a 3D Maya artist (prior to its existence as a power animator) in the production department at BBDO, the worldwide advertising agency. Yet in the wake of 9/11, he decided to start his own company.” It was a time when a lot of my friends were leaving,” he recalls. “They just left town, some going as far as to leave the country, but I decided to stick around. I was going to try and make a go at starting my own company in New York—try to rebuild a little bit here and keep the work local. It might have always been in my subconscious, but after that day, my thought was ‘You never know what’s going to happen tomorrow, so if I want to do this I should do it now.’”

So My Active Driveway INC. a boutique design, VFX, and animation studio, was founded in New York City in 2001. According to Choo, the past 15 years have seen the studio scale up and down in staff size, property, square footage, machinery, and equipment. “We’ve made ourselves adaptable to the industry’s climate, says Choo. “Having come from an agency background at BBDO NY, I had a solid understanding of the ups and downs of the industry. When business is good, we’re running on all cylinders, pumping out work as fast as possible. But when there’s downtime, you want to make sure you’re not just burning fuel.” Choo believes that this level of experience and understanding ultimately led him to BOXX. “It’s why,” he says, “after trying so many other products, we stick by BOXX as the backbone of our studio.”

At one point, Choo and his My Active Driveway team did what a lot of other studios have tried. In an effort to save money, they built their own systems instead of adding to or upgrading from their existing Dell computers and BOXX workstations (in this case, a 2008 model 3DBOXX 8404 and a 3DBOXX 4860 purchased in 2011). “Workstations, custom render farms, and custom servers,” Choo recalls, “you name it, we tried it. We always thought, we can save money by just doing it ourselves and that sort of worked for awhile—until it didn’t. Then we were in a deadline and panicking because there was no support for our custom-made equipment that broke down during the job.” To make matters worse, there were other mitigating factors that Choo had never really considered. “Honestly, in the long run, if you calculate all the hours and research, as well as enormous electric bills, we wasted a lot of time, money, and frustration,” he admits. “Not to mention, every freelancer that worked with us was always fighting over who got to use the BOXX workstations, rather than our custom builds, or even the Dell systems.”



BOXX Makes it Possible

In the beginning of 2015, My Active Driveway decided it was time to rebuild their office—and as a byproduct of that process, also made the decision to revamp their computer hardware.

First, they said goodbye to their massive 120 core AMD Dell render farm servers and replaced them with eight renderPRO nodes neatly stacked on top of each other. “We went for a clean sweep,” says Choo, “so we also started fresh with all-new APEXX 2 workstations for everyone.”

under a three week deadline. There’s no way we could have done that had we not just upgraded all of our equipment to BOXX. It was clear and seamless across the board. Everyone had the same system, the render farm worked beautifully, and we were able to ship and deliver under this crazy timeline.”



Choo selected the compact, liquid-cooled APEXX 2 Model 2401 featuring an Intel® Core™ i7 safely overclocked to 4.5 GHz and NVIDIA Quadro graphics cards. The end result of the hardware overhaul didn’t go unnoticed. “The performance boost was insane,” says Choo. “Using Autodesk Maya on the workstations and Arnold on the renderPROs, we were able to render a sixty second, all-character animation spot for the National Hockey League (NHL) in less than 48 hours. That was roughly four times faster than what we had before.”

The NHL commercial was actually the second spot My Active driveway had created for the NHL. “They approached us,” Choo recalls. “They were looking online, came across our website, saw the work, and reached out. They were extremely nice and super supportive—a great client to work with.” Undoubtedly, the League wanted another ad after Choo and company so quickly turned around their initial assignment. “The first one we did was insane,” he says. “I think it was a 30 we concepted, designed, animated, rendered, composited, and finished

Seemingly impossible timelines are often routine at My Active Driveway, but Choo recognizes that quick turnarounds, along with the outstanding quality of their work, are what keep the studio humming along. “That’s how small companies like us stay in business,” he admits. “We have to take on the crazy jobs that other people don’t want. They don’t want the headache of it all, so we get a shot at it.”

And the heavy hitters keep on coming. At the time of this publication, My Active Driveway was creating seventeen character animation spots for Lowe’s Home Improvement, another high profile client already on their reel. “But this type of work is new,” says Choo. It’s photoreal CG. I think you’re going to like it when you see it. The spots are trickling out. The first four have already hit the airwaves. We have another four weeks to finish the rest. Two more next week. For such a small shop to put out this volume of work says a lot about who we are and what we’re capable of.” Choo is quick to credit his BBDO history with making the Lowe’s work possible. “Having worked there,” he says, “I have

that connection. They've been one of our clients for years. BBDO is a great agency. They've been very supportive and we've done a lot of work for them. When they need us, we just take care of it—again, it's taking on the jobs that others think are simply not possible."

My Active Workflow



When asked to discuss My Active Driveway's workflow, Choo admits that he doesn't consider it unique. "I don't think our workflow is vastly different from anyone else's," he says. "You start with a concept, you get approved boards, you move into model rigging, pre-vis, animation, render, and then composite. We use the Adobe Creative Suite—mostly After Effects, Premiere Pro, Photoshop, Illustrator, and InDesign. Depending on the project, for composite we do either After Effects or Nuke. For 3D, we work in Maya and render out using Arnold. The biggest difference in our workflow is that we're a small shop. We don't have dedicated IT people, we don't have dedicated render techs, we don't have dedicated anything. We have a limited number of seats and we have to do the most with those seats, so a lot of our people are multitasking and wearing different hats."

In addition, those limited number of seats are installed on a limited number of workstations,

so if one system goes down, Choo says, "it's a pretty big deal." That's why he considers BOXX APEXX workstations and renderPRO render farm among the best business decisions he's ever made. "I don't like to name names," he confides, "but if you deal with a bigger company you have to go through this RMA process. Then they see if your support is really validated, if it warrants the claim. They definitely won't ship overnight. I love the fact that I can call BOXX, somebody will pick up the phone and I can tell them what's going on and you guys don't hesitate to ship out a new part that can be easily replaced overnight or even ship a new, complete workstation. My downtime is minimized. Just knowing that I bought systems that have that kind of support is invaluable. I'm the tech person here, so I'm the guy who has to fix a machine if it goes down. I'm also the one who's paying for it."

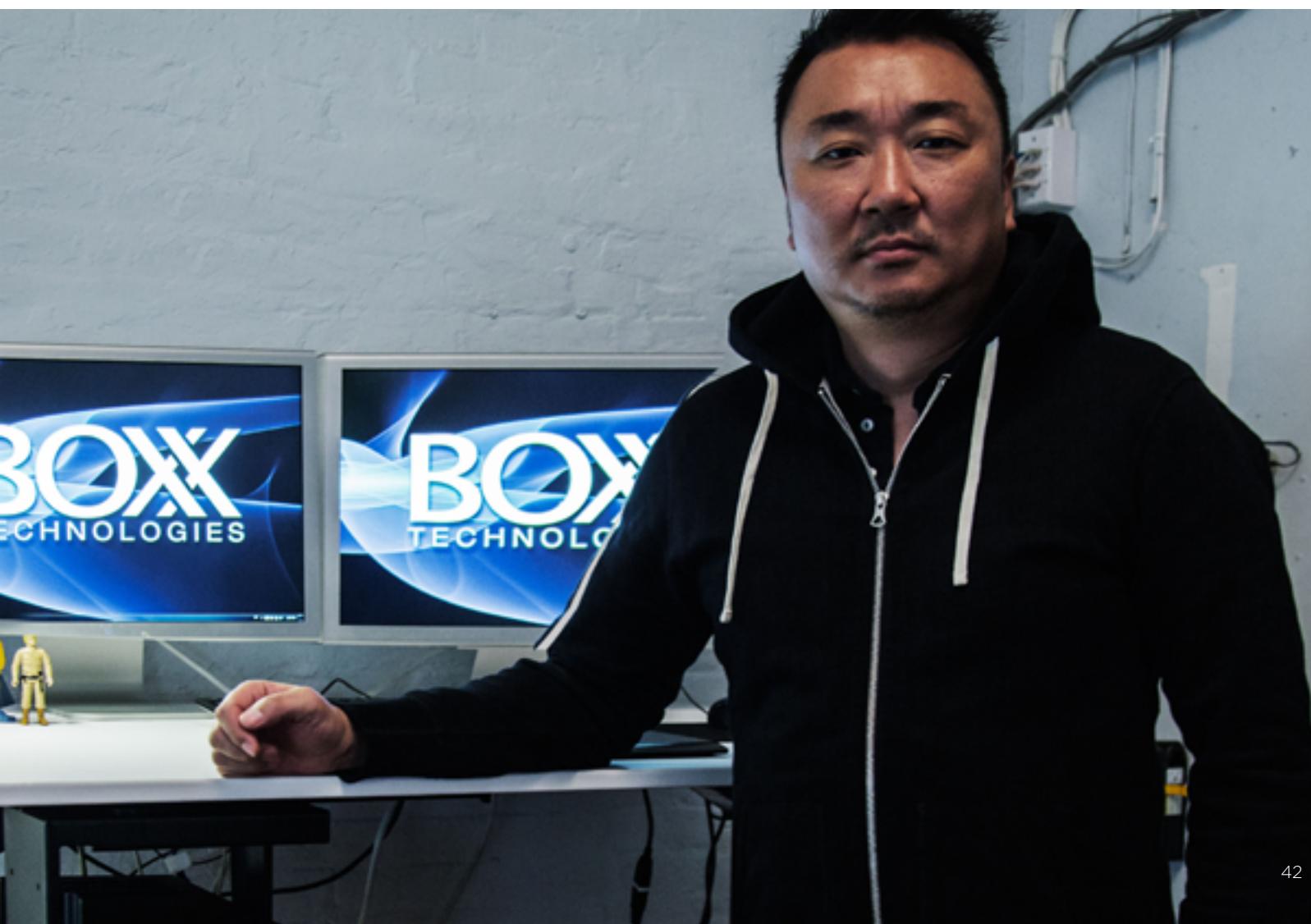


Customer for Life

Regarding the future of My Active Driveway, Choo admits that he would love to expand his render farm. Yet even with his compact renderPRO modules, studio square footage is at a premium. "We're in the middle of a space constraint right now," he admits, "but if I could have ten more renderPROs I'd do it in a second simply because everyone wants to use them all the time! Its one thing when you're creating a single spot, but when you have seventeen starting to overlap and they need to get these renders out, we're at a point where the render nodes are going day and night. They also make revisions on these spots, so it loads up. Then the Nuke artists want to use it to render the nuke comps on!" Despite the renderPRO render farm running "day and night" Choo points out another reason why a BOXX render farm was a brilliant business decision. He refers to it as "another beautiful side note." My Active Driveway's electric bill dropped from over \$4000 per month to under \$600. "That's how

much energy those old, slow, giant machines were wasting!" he exclaims.

Accelerated workflow, increased productivity, making deadlines, saving money, and . . . if it seems like Choo has covered all the bases, he circles back one more time to emphasize what made him a BOXXer—legendary technical support. "That was perhaps the biggest factor in choosing BOXX as the backbone of our company," he says. "I can't express enough how essential it is to feel like you matter as a customer. If I have a problem, I call BOXX support and they answer the phone—fast! They treat me like I'm their best customer. If there's a problem with the system, they take care of it immediately, no questions asked. I really admire and appreciate the fact that I get big company level support from BOXX when we're just a little shop like this. That's the kind of service that makes me a customer for life." ■





APEXX 4
MODEL 7404

THE ULTIMATE MACHINE FOR COMPOSITING

Featuring the new 10-core Intel® Core™ i7 processor with one core overclocked at 4.3GHz and the other nine at 4.1GHz, APEXX 4 7404 also has enough room for **up to four dual-width GPUs.**

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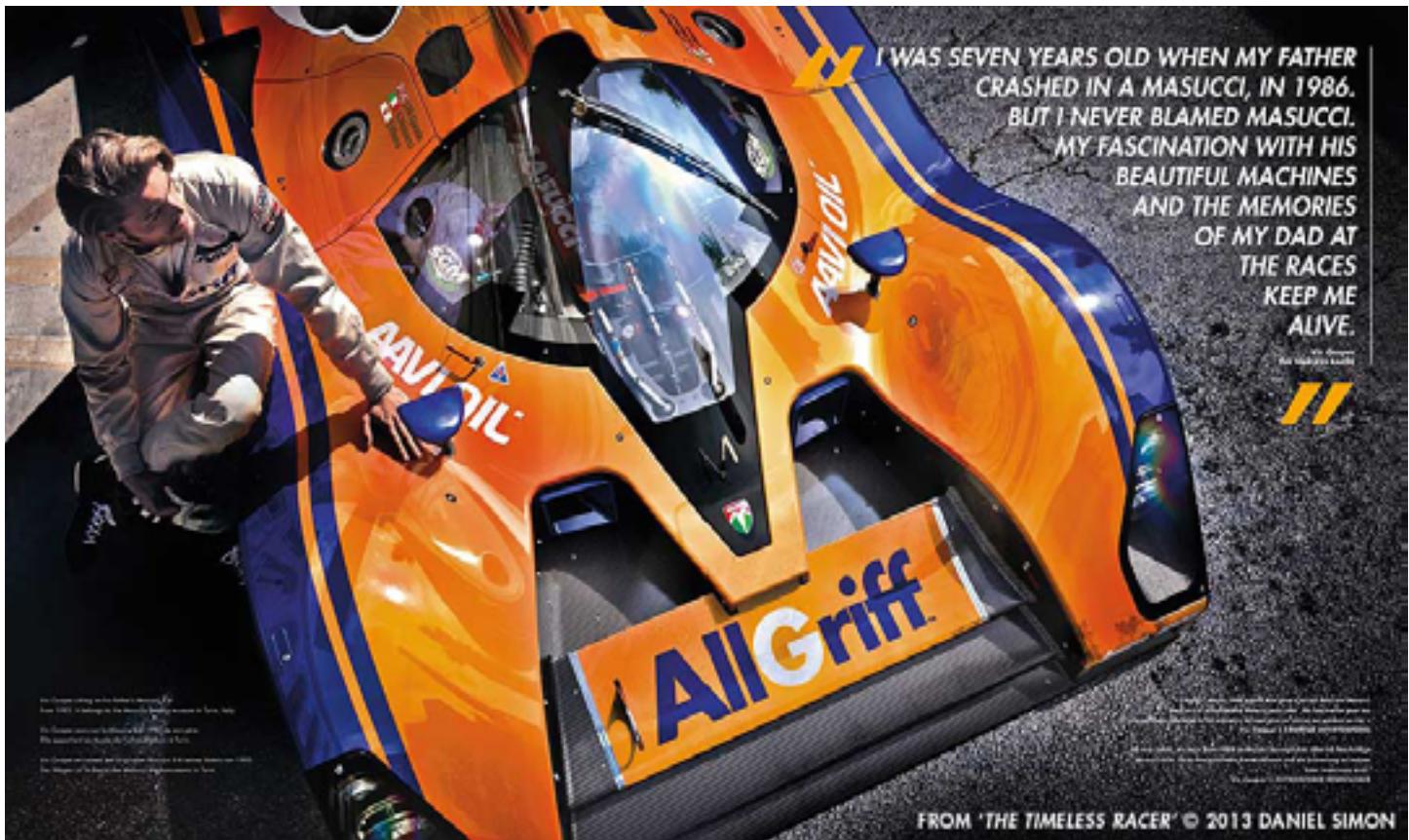
Daniel Simon loves machines. He is intrigued by how they work and consumed by how they look. To him, a vehicle is not merely something you drive, sail, or fly from point A to point B. It's also more than just a work of art. For Simon, these machines are part of a universal story, an integral part, and the only thing he enjoys as much as creating fantastic looking machines, is crafting the back story that accompanies them.

Born in Germany, Simon began his professional career as a designer at Volkswagen and Bugatti. After stints in Spain, England, Brazil, and Japan, the concept designer, producer and author now calls Los Angeles home. It is here where he creates iconic fantasy vehicles for Hollywood blockbusters like Tron: Legacy, Captain America: The First Avenger, Prometheus, and Oblivion. His client list ranges from Warner Bros. and Universal, to Disney, Formula1, Lotus, and Hamilton. He also continues to offer automotive design services and lectures, all while creating his own vehicle fantasy worlds, first in the book: Cosmic Motors, followed by his latest work, The Timeless Racer: Machines of a Time Traveling Speed Junkie: Episode 1.



TIMELESS DESIGNER

BOXX CUSTOMER STORY
BY: JOHN VONDRAK



The Timeless Racer

Where Cosmic Motors presented (from concept to completion) photorealistic spaceships, race cars, trains, warships, and balloons from planets within a faraway galaxy called Galaxion, Timeless Racer delves much further, presenting Simon as both artist and storyteller. "One day, I want it to be the Star Wars of motorsports," he confides unabashedly. He initially set out to create a parallel world, a definitive picture book of high-resolution renders focused on a vast universe of racing machines that would all be connected—from 1920's motorcycles and 50's era airplanes to futuristic cars, sea vessels, and

spaceships. He just needed a way to tie it all together. The solution came in the form of a fictional character named Vic Cooper, a time-travelling race car driver. "He's the hero of the story," explains Simon, "and each episode introduces us to one of his time travels to a specific race, the first being an endurance race in 2027."

Lights, Camera, Action

In 2005, as Simon left Volkswagen, L.A.-based publishing house Design Studio Press, having visited his website, approached him about creating a book of his works. "They didn't realize that what they saw on the site—that was it," Simon confesses. "800 pixel, low resolution images. But with a prospect of having my artwork printed in books to be sold worldwide, locked into physical paper for years to come, I needed to supercharge my visualization skills—way before the arrival of plug-and-play render tools. With the help of online tutorials and trial-and-error, I learned to build shader networks and scenes in Autodesk® Maya® and mental ray®." The result was Cosmic Motors and Simon



Daniel Simon and his team work on design concepts for Captain America.

viewed it as an opportunity to do his very best work and then file that one particular chapter of his life away. He had pushed science fiction vehicles to the limit and the Autodesk® Alias® software as well. "Cosmic Motors was my test bed for Alias," he recalls, "my test challenge to learn 3D, to learn Photoshop, Paint, atmospheres, and learn about photography."

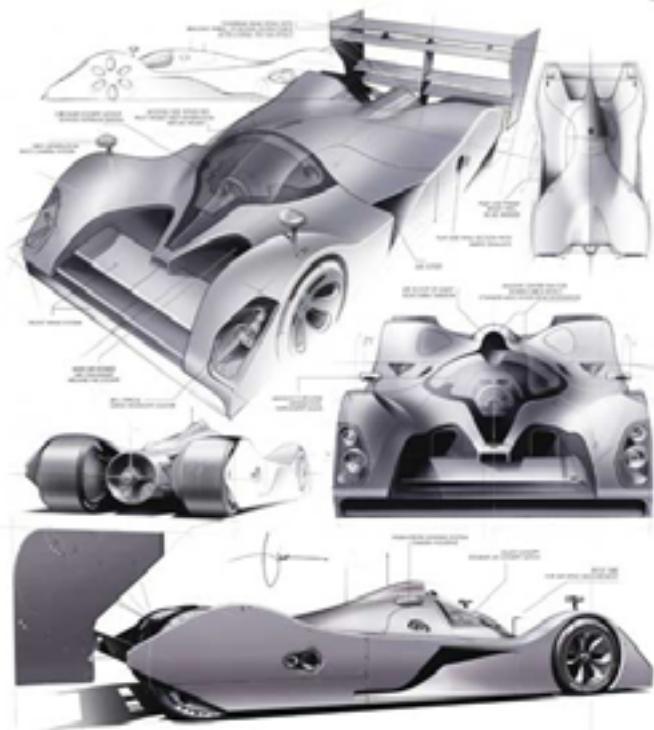
Soon afterward, Hollywood called and Simon discovered that creating vehicles for motion pictures is an experience profoundly different from his books. "It's a different field," he admits. "My mind has to switch completely. Movie design is design service. Everything that the film is about is the story. The director is by far the most important person and whatever he wants, you put that into your design. Where you come in as a creative and what differentiates you from another designer is your interpretation of it." Although Simon once worked with a director who did request a thousand sketches based upon the premise that he would perhaps like one of them, the designer reassures that such practices are far from the norm. "It really depends upon the director," he says, "but (directors) Joe Kosinski (TRON: Legacy, Oblivion), Ridley Scott (Prometheus), or Joe Johnston (Captain America) were extremely precise about what they wanted." Many design clients favor 3D, so now Simon will do a mix of sketches and very rough 3D models in Alias. "I would maybe draw a very precise mapping where I have shut lines and

details," he says, "even shadows, sometimes things that are not in a 3D model, but I'll map that as a 3D model and let them see something in a day or two."



A Real Piece of Machinery

In recent years, Simon has been known to strongly endorse BOXX workstations with a devotion borne out of the possibilities of GPU rendering. "I work with software companies like Autodesk and Bunkspeed," says Simon, "and it was through Bunkspeed that I got in touch with NVIDIA and learned that you can do more with four cards instead of one. I wanted to have four slots for GPUs to render in Iray via Bunk-speed at the fastest speed, solid state drives for quick booting, and powerhouse processors for Alias, Photoshop, and Premiere." He chose the 3DBOXX 8550 XTREME (24 cores in hyper-thread mode), which at the time of purchase, was the fastest workstation available. "I feel a ruggedness to it like it's a workhorse," says Simon. "It's industrial, like a real piece of machinery—elegant, heavy-duty machinery. I'm again rendering hard-core on the GPU for sometimes 48 hours in a row and that thing is just running high-voltage, high wattage. Their consumer service is big too, no doubt about that. The tech support hotline feels more personal and is very responsive. With BOXX, it feels real. I know they're in Texas and the machine feels like it is made by people who do what I do." ■



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BOXX CUSTOMER
STORY

BY: JOHN VONDRAK

THE ANIMATOR

Meet Webster Colcord, the animator and motion capture artist who relied on a battle-scarred BOXX workstation to bring **Ted** to life.



A native of Eugene, Oregon, animator Webster Colcord went to work for Vinton Studios right out of high school, cutting his teeth on projects like the Emmy Award-winning *A Claymation Christmas Celebration* and Michael Jackson's *Moonwalker*. This was followed by years of freelance and studio work that includes countless commercials and Hollywood productions like *James and the Giant Peach*, *Antz*, and *X-Men: Day of Future Past*. Most recently, Webster has earned raves for his outstanding motion capture work Seth MacFarlane's *Ted* films. Currently animation supervisor at Atomic Fiction (*Star Trek: Into Darkness*, *Flight*, *Cosmos*) in Oakland, CA, Webster generously agreed to share his time by taking a few questions.

Growing up in Eugene watching King Kong, The Seventh Voyage of Sinbad, Bakshi's Lord of the Rings (did you watch American Pop as well?) did you have any aspiration to become a filmmaker, or was it always the quality and creativity of the animation itself which inspired you? As a side note, did you ever see Watership Down? Like Bakshi's rotoscope stuff, the overall look of that animation really blew me away as a kid. A few years back, I found the DVD for my own kids and it scared the hell out of them at first, but they love it now.

I have seen *American Pop*, but not as a kid. That one wasn't in theaters very long, as I recall. *Watership Down* scared the hell out of me as well! I wanted to be a cartoonist, comic book artist, and at one time

a make-up FX artist. I think it was more the desire to make monsters than to be a total filmmaker, but as I got older, I started understanding the visual storytelling techniques of film and I wanted to try my hand in it.

You were fresh out of high school when you created the "audition" sculptures for Vinton Studios. Had you been creating sculptures throughout childhood and had you ever attempted to shoot any stop motion with them?

In my teens I shot a lot of experiments both on film and video. For animation, you really had to use film back in those days. The single-frame recording capabilities of videotape were never very good. So I started with Regular 8mm, then Super 8mm, then 16mm. I tried all kinds of techniques in those early experiments; double-exposure, split-screen with live action, space shots, a little bit of rear projection, replacement animation, foreground miniatures, glass shots... none of it was very good. But yes, a lot of sculptures and little animation puppets –and a lot of pyrotechnics!

Yours is an impressive resume. Was the transition from clay to digital animation difficult, or did it seem like more of a natural progression for you?

It was difficult! I did have some prior experience getting slightly familiar with digital animation. My buddies at Hash Animation in Vancouver, Washington had given me a copy of their software (Animation Master) to learn on, and I had fooled around a little. At the time I made the transition in 1997, I had my own small animation studio in Portland, Oregon

and I was producing and directing commercials and interstitials. I had worked on a couple of feature projects, but it was quite a shock to suddenly be neck-deep in a big initial CG feature within a large-ish studio. That was *Antz*, at PDI (newly a part of DreamWorks at the time) and there were all manner of difficulties.

What I discovered was that Hash Animation Master was sort of advanced! At the time, most of our animation at PDI had to be done using a spreadsheet. There wasn't really a graphical manipulator, or poser, until later on. We were using the new SGI O2 machines, which were new and hot at the time, and I was learning Unix. It was really diving into the deep end of the pool!

For about a year, I struggled and then suddenly had an epiphany. It was that even though it was dimensional animation, I was hurting myself animating sorta' straight-ahead like you would do in stop-motion. The former cel animators seemed to make the transition easier, and that was because they were working pose-to-pose and locking those key poses down across the animation controls. I was also learning that In CG, your brain is pretty much the only muscle you're using, and you have to be very disciplined in organizing your work to be edited and iterated on later. Before that, I had worked fairly intuitively and loosely in stop-motion, where you actually get to use your body in your work. The whole exercise of learning CG made me more disciplined in stop-motion as well—more cerebral.

In addition, starting in a very structured studio where everyone was a specialist in their specific

departments, where animators only do animation, was sort of coming into CG backwards from how artists learn CG today. Instead of learning CG from the ground up, I learned from a specific discipline and have been working backwards over the years to become a generalist. That has been a really interesting learning process, and I'm still just a remedial modeler!

You mentioned to CGSociety that after owning your own shop you were tired of working alone in your studio and that you wanted to learn new things and be part of a bigger team. Please explain that need or desire as I think some creators, in regard to the bigger team aspect, might want to go in the opposite direction.

Well, it's a tricky thing. If you tend to be your harshest critic, which many artists are, then you start to become paranoid about being in a vacuum and you doubt the accuracy of your own judgment. And by-and-large, it's easier to learn from others around you than from written documentation—more so because an animator sitting next to you has searched out the exact same problem you're encountering and has already done the legwork to find that (usually undocumented) work-around.

Of course, you also want to be locked away in seclusion and work on your "masterpiece." Animators tend to take it to the extreme though and spend months and years in seclusion, working on their films. You just get tired of being alone, I think. You want the "esprit de corps" of working in a group. Then after working in the group, you want to be alone. It's a pendulum.



Your work on the Ted films is incredibly lifelike and seamless. You already gave a great description of the motion capture process to CGSociety, so I'll not ask you to rehash that. If you could though, please add any additional information, especially regarding the challenges your workflow presents.

Well our VFX supervisor, Blair Clark, was adamant that we not do anything “too different” that would result in a change in the character, so we took incremental steps. We improved the look of the real-time hardware rendered Ted (which is what the crew sees on-set) and the post-vis Ted model,



It's really a standard workflow. We capture the motion, do a little processing, sync up the takes and send them to the VFX houses that use animation layers to enhance the acting. They also keyframe the lip sync and a lot of other stuff. For our post-vis, we use a slightly older method, where we use a multi-skeleton rig that blends the mocap and keyframe.

The only thing we're doing different is we're being very mobile about the capture set-up, doing it on location when possible, and the actor in the suit is also the director. That makes a huge difference and it's an unusual situation. Seth (MacFarlane) is very specific about what he wants and is using the tech to ensure the performance comes out how he envisioned.

Some of the locations were extremely challenging, and rough on the gear. We had some bad weather in Boston and cramped conditions, shooting in tight spaces—tiny bars, the diner, Tom Brady's bedroom. We had the dedicated BOXX that runs the mocap system in a protective case, but it can only shield so much from heat, dust, dampness, and bumps. And every day, it was on-and-off the truck. For those tight shooting spaces, we would have to take it out of the protective cart and set it up free-standing on the floor of a location.

Were there greater advances in technology (coupled with your own experience) that made the second film any easier?

and we re-designed the way we use the suit so that application time was cut way down. Every second counts on a live action set, after all.

In the middle of our Ted 2 the production schedule, however, Xsens, the makers of our mocap suit, released a radically better version of their system which uses much smaller sensors with great improvements in their software. So we used that suit for a big musical number featuring Ted and a huge cast of dancers. For that one sequence, four different dancers wore the new Xsens suit, each of them playing Ted in different sections of the sequence. That was really challenging, fun, and a real test of Xsens' new system. It worked really well.

Describe the experience of working on the BOXX system. How does it differ from other systems you've used?

Always very reliable and never any hardware problems that I recall. I do recall having a power supply in a machine, it wasn't a BOXX, go out at The Orphanage. It was kind of scary, a big “zap” and a burning electrical smell.

What workflow problems has the BOXX systems solved? In other words, what it has meant for you in terms of time saved, deadlines met, etc.

The BOXX unit that we purchased in 2011 on Ted has been in and out of my professional life for four years

now. Because Seth MacFarlane's team produced the new *Cosmos*, I ended up working on the same machine doing pre-vis for the series. And when Seth was doing a promotional commercial that was a tie-in between his film *A Million Ways to Die in the West* and *Ted*, we did a couple of mocap sessions for that. During production on that commercial, the system was being unloaded from a truck (I wasn't there) and was dropped off the back and onto the sidewalk. The monitors shattered, but the BOXX made it through just fine, with one little scar from the event. We've never had it serviced and it has been working in all sorts of terrible locations since 2011. I'm just amazed by its durability!

Discuss the future of your work and if you see BOXX as being part of that future.

The tools for CG have evolved and gotten more user-friendly, for sure, but the learning curve is steeper. The advances mean that there's just more to know. You have layered innovations upon innovations. Overall, entry-level CG is more accessible. But for the big, challenging stuff, be it feature films or 360/real-time/VR, the complexity just keeps getting raised. It's no longer "live action background with CG creature", rather it's "photoreal city with dynamic camera and digital double constrained to moving vehicle driving XYZ different simulation packages."

And sadly, the majority of consumer-level machines have been dumbed-down for the masses, made so that the UI is pretty, but inside it's gutless. Or rather, the tools aren't there to produce, they are media consumption devices. In other words, many machines to view beautiful images, but very few that can create them at a high level. It's a weird time!

Editor's note: Since this interview, Webster has purchased his own BOXX APEXX 2 3402 workstation featuring an overclocked, eight-core Intel® Core™ i7.

CGSociety referred to you as "a true master of the art of mocap." That sounds accurate, but for business card purposes, I'd suggest "Mocap Master." Do you feel like you have this process mastered or, in your mind, is there always more to do and learn?

I am definitely NOT a "mocap master." I have been on the user end of mocap for a long time and of course I have a lot of experience specific to the *Ted* films and the Xsens/MVN system, so there's that. If you were to put a pile of optical mocap cameras in front of me and ask me to set-up a volume I would be helpless. I'm an animator benefiting from innovations in hardware and software that make mocap more accessible. ■



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BOXX

APEXX 1

Model	Starting Price	Processor	Cores	Overclocked	Overclocked Frequency	Maximum Memory	Maximum GPUs	Total USB Ports	Power Supply
1201	\$2,202	Intel® Core™ i7 Intel® Core™ i5	4	No	N/A	32GB	1	2.0 (4), 3.0 (8)	250W 300W
1401	\$3,139	Intel® Core™ i7	4	Yes	4.4GHz	32GB	1	3.0 (8), 3.1 (2)	300W
1601	\$4,307	Intel® Core™ i7	8	Yes	4.0GHz	32GB	1	2.0 (2), 3.0 (4), 3.1 (2)	300W
1802	\$4,030	Intel® Xeon® 1600v4 Intel® Xeon® 2600v4	Up to 22	No	N/A	64GB	1	2.0 (2), 3.0 (4), 3.1 (2)	300W

APEXX 2

Model	Starting Price	Processor	Cores	Overclocked	Overclocked Frequency	Maximum Memory	Maximum GPUs	Total USB Ports	Power Supply
2202	\$2,226	Intel® Core™ i7 Intel® Core™ i5	4	No	N/A	64GB	1	2.0 (4), 3.0 (8)	550W
2402	\$2,997	Intel® Core™ i7	4	Yes	4.4GHz	64GB	2	3.0 (8), 3.1 (2)	550W
3202	\$3,055	Intel® Core™ i7	Up to 10	No	N/A	64GB	2	2.0 (2), 3.0 (4), 3.1 (2)	850W
3402	\$4,569	Intel® Core™ i7	8	Yes	4.125GHz	64GB	2	2.0 (2), 3.0 (4), 3.1 (2)	850W
3403	\$5,639	Intel® Core™ i7	10	Yes	1 @ 4.3GHz 9 @ 4.1GHz	64GB	2	2.0 (2), 3.0 (4), 3.1 (2)	850W

APEXX 4

Model	Starting Price	Processor	Cores	Overclocked	Overclocked Frequency	Maximum Memory	Maximum GPUs	Total USB Ports	Power Supply
6102	PLEASE CALL	Intel® Core™ i7	4	Yes	4.4GHz	64GB	4	2.0 (6), 3.0 (6), 3.1 (2)	850W
7203	\$3,958	Intel® Core™ i7	Up to 10	No	N/A	128GB	4	2.0 (2), 3.0 (8), 3.1 (2)	1250W
7403	\$4,938	Intel® Core™ i7	8	Yes	4.125GHz	128GB	4	2.0 (2), 3.0 (10), 3.1 (2)	1250W
7404	\$7,246	Intel® Core™ i7	10	Yes	1 @ 4.3GHz 9 @ 4.1GHz	128GB	4	2.0 (2), 3.0 (10), 3.1 (2)	1250W
7902	\$5,294	Intel® Xeon® 2600v4	Up to 44	No	N/A	256GB	4	2.0 (4), 3.0 (6)	1250W

APEXX 5

Model	Starting Price	Processor	Cores	Overclocked	Overclocked Frequency	Maximum Memory	Maximum GPUs	Total USB Ports	Power Supply
8401	PLEASE CALL	Intel® Core™ i7	10	Yes	1 @ 4.3GHz 9 @ 4.1GHz	128GB	4	2.0 (2), 3.0 (10), 3.1 (2)	1500W
8401R	PLEASE CALL	Intel® Core™ i7	10	Yes	1 @ 4.3GHz 9 @ 4.1GHz	128GB	4	2.0 (2), 3.0 (10), 3.1 (2)	1000W 2000W
8904	\$10,900	Intel® Xeon® 2600v4	Up to 44	No	N/A	512GB	5	2.0 (4), 3.0 (4)	1500W
8904R	PLEASE CALL	Intel® Xeon® 2600v4	Up to 44	No	N/A	512GB	5	2.0 (2), 3.0 (2)	1000W 2000W

ProVDI 8401R-V

Model	Starting Price	Processor	Cores	Maximum Memory	Maximum GPUs	Total USB Ports	Power Supply
8401R-V	PLEASE CALL	Intel® Core™ i7	Up to 10	128GB	4	2.0 (2), 3.0 (6)	1000W 2000W

G Series

Model	Starting Price	Processor	Cores	Maximum Memory	Maximum GPUs	Total USB Ports	Power Supply
G8	PLEASE CALL	Intel® Xeon® 2600v4	Up to 44	512GB	4	2.0 (2)	1000W 2000W
G12	PLEASE CALL	Intel® Xeon® 2600v4	Up to 44	512GB	6	3.0 (2)	1000W 2000W

GoBOXX SLM

MODEL	STARTING PRICE	PROCESSOR	CORES	MAXIMUM MEMORY	MAXIMUM GPUs	TOTAL USB PORTS	POWER SUPPLY
15 SLM	\$2,718	Intel® Core™ i7	4	16GB	1	3.0 (2), 3.1 (1)	180W
15 SLM Performance	\$3,522	Intel® Core™ i7	4	32GB	1	3.0 (2), 3.1 (1)	180W
17 SLM	\$3,396	Intel® Core™ i7	4	32GB	1	3.0 (2), 3.1 (2)	180W

GoBOXX MXL

MODEL	STARTING PRICE	PROCESSOR	CORES	MAXIMUM MEMORY	MAXIMUM GPUs	TOTAL USB PORTS	POWER SUPPLY
15 MXL	\$3,721	Intel® Core™ i7	4	64GB	1	3.1 (1) Thunderbolt	230W
17 MXL	\$3,522	Intel® Core™ i7	4	64GB	1	3.1 (1) Thunderbolt	230W

GoBOXX MXLVR

MODEL	STARTING PRICE	PROCESSOR	CORES	MAXIMUM MEMORY	MAXIMUM GPUs	TOTAL USB PORTS	POWER SUPPLY
MXL VR	\$3,389	Intel® Core™ i7	4	64GB	1	3.1 (1) Thunderbolt, 3.1A (3)	330W

renderPRO 1

MODEL	STARTING PRICE	PROCESSOR	CORES	MAXIMUM MEMORY	MAXIMUM GPUs	TOTAL USB PORTS	POWER SUPPLY
renderPRO 1	\$3,266	Intel® Xeon® 2600v4	Up to 22	32GB	1	3.0 (4)	300W

renderPRO 2

MODEL	STARTING PRICE	PROCESSOR	CORES	MAXIMUM MEMORY	MAXIMUM GPUs	TOTAL USB PORTS	POWER SUPPLY
renderPRO 2	\$3,745	Intel® Xeon® 2600v4	Up to 36	128GB	1	2.0 (3)	350W

renderBOXX

MODEL	STARTING PRICE	PROCESSOR	CORES	MAXIMUM MEMORY	MAXIMUM GPUs	TOTAL USB PORTS	POWER SUPPLY
renderBOXX	\$4,098	Intel® Xeon® 2600v4	Up to 44	128GB	1	2.0 (2)	500W

renderFARM

Specs listed below are PER NODE

MODEL	STARTING PRICE	PROCESSOR	CORES	MAXIMUM MEMORY	MAXIMUM GPUs	TOTAL USB PORTS	POWER SUPPLY
renderFARM on Wheels	PLEASE CALL	Intel® Xeon® 2600v4	Up to 44	256GB	1	2.0 (2)	500W

serverBOXX

MODEL	STARTING PRICE	PROCESSOR	CORES	MAXIMUM MEMORY	MAXIMUM GPUs	TOTAL USB PORTS	POWER SUPPLY
S9100	PLEASE CALL	Intel® Xeon® 2600v4	Up to 22	512GB	0	2.0 (2)	920W 1000W

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