

SUCCESS STORY | NEW REALITY COMPANY

CROSSING THE LINE FROM SPECTATOR TO ACTIVE PARTICIPANT



A photorealistic Amazon jungle at sunset; made in Unreal Engine.
Credit: New Reality Co. and Jakob Kudsk Steensen



NEW REALITY COMPANY LEVERAGES NVIDIA® QUADRO® P6000 GPUs TO DELIVER POWERFULLY IMMERSIVE 360-DEGREE VIRTUAL REALITY EXPERIENCES.



NVIDIA Quadro P6000 GPU offers viewers the first-person experience of a tree growing in the heart of the Amazon rainforest.

Based in New York City and Los Angeles, New Reality Company uses virtual, augmented, mixed, and even actual reality to tap into positive social change and explore the human experience. As a highly collaborative company, New Reality partners with corporations, foundations, and artists from all disciplines to help elevate their message. At the 2016 Sundance New Frontier Festival, they premiered *Giant*, a VR film that portrays an American family in an active war zone. *Giant* was one of the first VR projects to combine semi-volumetric live action video with game engine software. *Tree*, the second piece of the New Reality trilogy, focuses on man-made catastrophes and cultivates a call to action by placing the viewer into the body of a growing tree from seedling to maturity.

CUSTOMER PROFILE



Customer: New Reality Company	Industry: Interactive motion pictures and immersive installations	Locations: New York City and Los Angeles	Employees: 7 core employees	Website: https://www.treeofficial.com/
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New Reality co-founders Milica Zec and Winslow Porter together were recently named to Adweek’s Top 100 Creatives in the Digital Innovators category.

Milica Zec and Winslow Porter of New Reality are Robert Rauschenberg Fellows, alumni of the Sundance New Frontier Lab, and artists-in-residence at creative agency Droga5 (14-time agency of the year winner by Adweek), the Technicolor Experience Center (A/D/O), a creative space in Brooklyn exploring boundaries in design. Zec and Porter together were named to Adweek’s Top 100 Creatives in the Digital Innovators category.



Pictured from left to right: Clem McIntosh, Zoe Winters, and Jordana Rose in *Giant*.

SUMMARY

- > A creative studio that taps into positive social change and explores the human experience via virtual, augmented, mixed, and actual reality.
- > Developing groundbreaking VR films and immersive 360-degree experiences.
- > NVIDIA Quadro GPUs deliver the performance needed to render complex environments at consistently high frame rates.
- > Projects like *Giant* and *Tree* are inspiring further development and growth of VR.

REASONS FOR QUADRO

- > Fueled by NVIDIA® Pascal™, NVIDIA's state-of-the-art GPU architecture.
- > 3,840 CUDA parallel processing cores, 24GB GDDR5X RAM, with PCI Express 3.0 x16 interface.
- > 12 TFLOPS 32-bit floating point performance.
- > Consistently delivers 90fps while rendering a complex 360-degree immersive environment.
- > Extensive global partner and support ecosystem.

CHALLENGE

For *Giant*, New Reality filmed actors in front of a green screen using a Red Dragon 5K camera paired with a Microsoft Kinect 2 depth camera that senses positions in 3D space. The results were then transposed into a virtual 3D environment created in the Unreal 4.13 development environment, which is typically used for high-end games. Wearing a HTC Vive headset, the viewer joins a family in a basement shelter as a war rages outside. Additional software used included Maya, Houdini, 123D Catch, Premiere®, After Effects®, and Photoshop®.

“We needed this extensive pipeline because volumetric cameras are still an emerging technology,” explained Milica Zec, cofounder of New Reality. “This limited us in several ways: First, the actors in *Giant* couldn’t move around the viewer. Second, the large volumes of data placed severe demands on our existing graphics card. Third, our headset frame rates were dropping below 45fps, and immediately viewers were getting nauseated.”

Tree bypasses the movement limitations of *Giant* by turning the viewer into a tree in the Amazon rainforest, where their torsos become the trunk and their arms the branches. This perspective offers an even more immersive and realistic experience where users become the linchpin of the piece, which required the ability to process complex materials, lighting, and shadows in real time, and in a complete 360-degree environment.



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Winslow Porter
Cofounder
New Reality Company

SOLUTION

To solve the frame rate issues for *Giant*, New Reality turned to HP Z840 workstations equipped with dual 8-core Intel Xeon CPUs, 64GB of RAM, 1TB of SSD storage, and a single NVIDIA Quadro M6000 GPU. The results were immediate.

“We recorded all our frame rates with several different workstation cards and were only getting 45 frames per second. Then we tried the Quadro M6000,” said Porter. “It was the fastest GPU we had seen so far. Our frame rates held steady at 90 frames per second with peaks over 100fps, and the resolution could not have been better.”

The Quadro M6000 is a high-end GPU that can handle nearly any environment shown on a single screen; however, the 360-degree environment in *Tree* required an even more powerful solution. For this film, New Reality upgraded to the NVIDIA Quadro P6000 GPU built on the state-of-the-art NVIDIA Pascal™ architecture. The P6000 easily processed the complex environment, lighting, and shadows in *Tree* while consistently delivering frame rates of at least 90fps.

“With *Tree*, we hoped to help people understand nature more through firsthand experience. This is one of the true gifts of VR, because you can immediately communicate with your audience,” Zec continued. “When you go to a film festival, a traditional piece screens twice. Our VR piece is screening every 10 minutes for eight hours a day throughout the entire 10-day festival. This means that we connect with almost 500 people on a very visceral, experiential level.”



“As immersive storytellers using real-time game engine as our tool of choice, the Pascal-based Quadro GPUs are an obvious choice because they push many more pixels than any other card on the planet. This allows the viewer to seamlessly inhabit the body of a tree as it grows from a seed to a full-size tree, changing the scale along, surrounded by an interactive environment with a stunning, photorealistic jungle setting, full of lush sights and sounds that really pull the viewer in... and when you see their jaw drop, that’s when you’ve accomplished your task as a storyteller.”

Winslow Porter
Cofounder
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RESULTS

Combining off-the-shelf hardware and software with the performance of NVIDIA Quadro GPUs is helping New Reality create more immersive and realistic experiences. *Giant* and *Tree* generate emotional responses by making viewers an integral part of the story.

“Experiences impact attitudes in a powerful way. The more real the experience, the more likely we are to influence the audience to act,” continued Porter. “We used professional NVIDIA Quadro GPUs to achieve the highest level of visual fidelity with near-zero latency for the most immersive and believable experience. With the P6000, we were able to just shred through all those polygons.”

“There is nothing easy or glamorous about creating VR, and the last thing you want to do in a VR experience is make the audience sick because that’s all they’ll talk about,” added Zec. “But when you get the environment and the experience of being in that environment right, the effect can be profound. It was amazing to see people reacting so emotionally. Many people cried.”

“We make sure that we’re hitting well above 90 frames per second in the Unreal video game engine, ensuring a comfortable, captivating experience for everyone who embarks on the journey of this rainforest tree,” concluded Porter. “As immersive storytellers using a real-time game engine as our tool of choice, the Pascal-based Quadro GPUs are an obvious and integral element because they push many more pixels than any other card on the planet. This allows the viewer to seamlessly inhabit the body of a tree as it grows from a seed to full-size. An interactive environment surrounds the viewer with a stunning, photorealistic jungle



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The use of readily available software like Unreal, Maya, IKinema, and Shotgun, as well as headsets like the HTC Vive and hardware like NVIDIA Quadro P6000, shows how the VR industry is incorporating existing technology to break out of its hobbyist and military origins. The fast advancement of these technologies means that New Reality’s projects can continue improving and advancing long after their release dates. For example, the 3D export for *Giant* was generated in 8K, even though 4K video is the current technological limit. The VR work in film and games is breaking ground for more commercial uses of VR, and projects like *Giant* and *Tree* are evidence of that growth.

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