Las Fuerzas Extrañas (Strange Forces): Exploring Gen-AI Tools in a Virtual Production Pipeline

Hybrid real-time virtual production practice used gen-AI tools throughout. Images courtesy of Topher Maraffi, Alecardo and NC State University (2025).

Practice-as-Research Statement

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Abstract

The award-winning short film Las Fuerzas Extrañas (Strange Forces, 2025) was a collaboration between NC State University Media Arts, Design and Technology (MADTech) department and Colombian American creative studio Alecardo, applying hyper-reality and theatre design concepts in our Virtual Production Lab to adapt the first Latin sci-fi novel to a short film. Experimenting with generative AI tools throughout the virtual production process, including worldbuilding, real-time creature performance and VFX, allowed us to reduce costs and speed up development while achieving Alecardo's vision rooted in a Latin magical-realism aesthetic. While this hybrid-AI approach allowed us to streamline our technical pipeline, human artists and performers were central to achieving high-quality results in each phase. The use of AI did not eliminate artistic roles in working towards the director's vision, but it did reduce production time and increased visual quality of the live-action shots. In his keynote address at our MADTechFest 2025, Ricardo Tobon of Alecardo stated that he had never completed a professional project as quickly at large studios like Sony, Weta and Dreamworks. We believe this experimental hybrid-AI approach to virtual production balanced the advantages of employing generative technologies with the artistic imperative of maintaining human craft and creative control throughout.

Experimenting with Gen-AI to Enhance Virtual Production on a Sponsored Project

NC State University Media Arts, Design and Technology (MADTech) faculty experimented with generative AI tools for enhancing virtual production shots in the award-winning short film Las Fuerzas Extrañas (2025) as part of a real-world sponsored collaboration with Colombian American creative studio Alecardo (Alex Restrepo and Ricardo Tobon). In the spring 2025 semester, Alecardo co-founder Tobon was awarded a $15K virtual production fellowship by our College of Design Virtual Production Lab to adapt the first Latin American sci-fi novel by Leopoldo Lugones, Las Fuerzas Extrañas (1908) or Strange Forces, into a magical realism short film to be shot over four days in our facility. Alecardo's

preproduction concept treatment featured a giant talking octopus held captive in an overgrown tropical lab forgotten in time, with a retro-futuristic aesthetic, and included fantastical VFX shots where the creature magically communicates with the scientist played by Restrepo. With such a limited production schedule and budget, MADTech faculty and students explored the use of gen-AI tools to speed up and reduce costs throughout virtual production, while ensuring that artistic craft was central to the process and the quality of each shot was suitable for the director's vision. How we used gen-AI tools in each phase of virtual production is demonstrated in our video breakdown (Maraffi 2026).

Hyper-Reality and Super-Puppet Concepts in Practice

MADTech graduate students in my studio course learned about Curtis Hickman's hyper-reality design concept, based on stage-magic principles and used to create the illusion of impossible experiences for the VOID VR Theaters (Hickman 2023). Hickman authored the textbook we use in my course and has guest-lectured to our students several times about hyper-reality design for VR experiences, but we experimented with applying the concept to hyper-real worldbuilding illusions in a virtual production volume. Students also learned about British theatre practitioner Edward Gordon Craig's concept of an über-marionette (Craig 1908), and how the virtual production system can function like a super-puppet through spatial and hyper-reality design in Unreal Engine, allowing live actors to perform visual effects and real-time characters in the LED wall (Maraffi 2025). Faculty and students used these two theatrical concepts based on illusionism and liveness to experiment with gen-AI tools that could increase the hyper-realism and immersive quality of sets and real-time creature interaction with actors in the volume.

AI-enhanced Worldbuilding in Preproduction

In the preproduction phase, graduate students in my Hyper-Reality Studio course used Blockade Labs AI Skybox to generate a variety of equirectangular images based on Alecardo's concept art for the abandoned tropical lab. The gen-AI tool provided the correct 360-degrees structure for the spatial design of the backgrounds in Unreal Engine 5.4, but they lacked realistic details and the retro-futuristic aesthetic of the concept art. After faculty selected and colour-corrected in Adobe Photoshop several potential candidates for a background, we used Magnific AI's Mystic tool to creatively upscale and re-style images to iteratively make them more hyper-realistic and closer to Alecardo's vision. The final background approved by Tobon was converted to a high dynamic range (HDR) image that could light the scene in UE5.4 as a backdrop, and became the basis for further lighting and virtual worldbuilding with free 3D assets from the FAB Unreal Marketplace. The advantage of using multiple gen-AI tools to iteratively refine the background image was that artists were able to make adjustments and put their craft into each step of the worldbuilding process.

AI-enhanced Creature Performance in Production

In production we used RADiCAL AI motion capture tool to real-time puppeteer the octopus creature in the climactic shot when it is interacting with the scientist. This is where we applied Craig's super-puppet concept to the virtual production system by Livelink streaming an off-camera actor performing the creature movements and light effects in UE5.4 scene through a hidden MetaHuman. We used a single webcam with RADiCAL AI to manipulate the octopus' body motions and trigger virtual and real light changes that indicated the emotional state of the creature. The real-time control of the octopus in the LED wall gave Restrepo a virtual acting partner to react to while we shot in the volume, along with Tobon voicing the creature through an off-camera microphone, increasing the immersion of the live actor in the scene. Both graduate and undergraduate students in my studio courses helped on set during the 4-day shoot as seen in this behind-the-scenes video.

AI-enhanced Visual Effects in Postproduction

In postproduction, we used Higgsfield AI to create visual effects during the climax when the scientist is obliterated from a storm of cosmic particles unleashed by the angry octopus creature. Initially we just did a slow dissolve to remove Restrepo from a clean plate shot of the particle storm, but it wasn't spectacular enough for the climactic moment. Using source footage shot in the volume as start and end frames, I instead developed a slow-motion disintegration effect in Higgsfield that could be seamlessly inserted into the existing footage. This would have been a time consuming and expensive VFX shot to do with standard CGI methods, but Higgsfield rendered a director approved version with surprisingly few iterations. Although the 10-second disintegration shot fit this application, the VFX imagery generated between the start and end frames lacked artistic control. Since completing this shot, however, we have been experimenting with video-to-video AI tools that afford more creative control over generated VFX frames.

PAR Lessons from Hybrid-AI Experimentation in a Virtual Production Volume

Our practice-as-research (PAR) takeaways from experimenting with gen-AI tools in our volume is that they can increase the speed and quality of virtual production shots while retaining creative quality control when using an iterative hybrid approach where human artists guide and evaluate each step. In Tobon's keynote speech at our MADTechfest event at the end of the spring 2025 semester, he stated that in all his years of professionally working at industry studios like Sony, Dreamworks and Weta, he had never completed a project of this quality in such a short production time. We believe gen-AI tools contributed to the success of this project in achieving Alecardo's vision and receiving placements and awards at international film festivals. Since developing Alecardo's short sci-fi film, hybrid-AI approaches to virtual production are becoming more adopted by industry studios. Innovative Dreams, a new studio founded by filmmaker Jon Erwin in partnership with Luma AI and Amazon Web Services, demonstrated a similar "realtime hybrid filmmaking" approach that combines performance capture with virtual production using Luma's gen-AI tools (Erwin 2026). They believe that this approach is the "future of filmmaking", citing similar reasons to our experience, and that it will create more opportunities for artists and performers in Hollywood (Boorstin et al 2026). As gen-AI companies increasingly partner with studios, tools are gaining more affordances for creative inputs beyond prompting, which puts the artist's craft directly into the generative process. We therefore continue to explore this hybrid-AI approach to virtual production in our lab.

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Bio

Topher Maraffi is a Media Arts, Design and Technology faculty at North Carolina State University and the lead researcher in the NCSU College of Design Virtual Production Lab. His research applies theatre arts concepts to emerging technologies like digital doubles, performance capture, virtual production and generative AI to spatially design immersive experiences in film, games and live shows. Please see the latest work on his website.