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How Multi-User Collaborative Virtual Reality Is Changing the Way Architects Design Spaces

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Learning Objectives

- Introduction of CannonDesign
- Technology in Practice
- Workflow: Revit to NVIDIA Holodeck
- Case Studies

Description

In this session, attendees will learn how to leverage the power of GPU to take advantage of NVIDIA Holodeck collaborative VR features. We will expand on hardware and software expectations for this type of VR experience. Attendees will leave the session with an in-depth understanding of best practices, and of our current workflow in developing NVIDIA Holodeck. We will build on our initial interaction with NVIDIA to help enhance the Early Access 1 tool set for Architectural Visualization, and will discover how our input helped shape the Early Access 2 enhancements to which we have access today. In addition, attendees will learn about case studies from internal design sessions including client presentations, which will display the power of the collaborative tools included in NVIDIA Holodeck.

Speaker(s)

Ernesto Pacheco started his career studying Architecture at the Universidad de las Americas-Puebla Mexico, before moving to the United States. He continued his studies in Interactive Design at Maryville University in St. Louis, MO. Ernesto has 18 years of experience in the Architectural field, he is CannonDesign's Director of Visualization where he leads Design Visualization efforts ranging from 3D rendering, animation, and VR/AR. He is also responsible for research and implementation of new technologies into the design process. Currently, Ernesto is in charge of VR/AR development and deployment, and has been a key participant to the Holodeck partnership between CannonDesign and NVIDIA helping inform and shape tools geared towards Architectural Design.

Introduction to CannonDesign

CannonDesign is an integrated global design firm that unites a dynamic team of architects, engineers, industry experts and builders driven by a singular goal — to help solve our clients' and society's greatest challenges.

Strengths
Our defining strength is our ability to harness creative intelligence — both ours and our clients — to develop solutions informed by a prism of perspectives, experiences, technologies and cultures. Our firm is purposely built to foster this high-level of multidisciplinary thinking, allowing our teams to assess situations from all angles and identify opportunities to improve rather than conform. This synergistic method allows us to identify and connect the best ideas across industries and geographies.


Technology in Practice

Technology in Practice (TiP) is at the forefront of advancing CannonDesign's multi-disciplinary practice through technological innovation and the development of digital workflows. This fusion of subject matter expertise pursues enabling and supporting our integrated project teams to exceed client's expectations through the strategic leveraging of digital technologies. A uniquely configured group of computation embracing design professionals focus their expertise through the lenses of Digital Practice, BIM Management and the different and evolving subgroups within these networks.

TiP aims to enhance our digital design capabilities and processes, transform design-decision-making, augment business operations, generate competitive advantage and provide leadership in the AEC Industry.

Workflow: Revit to NVIDIA Holodeck

Our current workflow starts with the translation of geometry from Revit into 3dmax.There we are faced with the task of cleaning up and optimizing the meshes to meet the Holodeck's maximum number of supported polygons. Holodeck does not currently support cameras. The 3D space origin serves as the starting point from which your models will be loaded into the software. Therefore, move the 3D model accordingly to stablish the starting point of the experience. All 3D elements that will require being interactive during the virtual session should be its own mesh. This can sometimes be a challenge depending on the size of the project. Holodeck requires the use of NVIDIA's Iray+ render engine and shaders. Luckily, the Iray installation provides the user with does not support light items. The work around is to utilize self-illuminated materials to mimic lights as needed. a conversion tool that expedites this step. The installation also provides a large library of vMaterials. Uvmaps are conserved from the Revit export so there is no need spend time modifying these unless the project requires more accurate mapping.
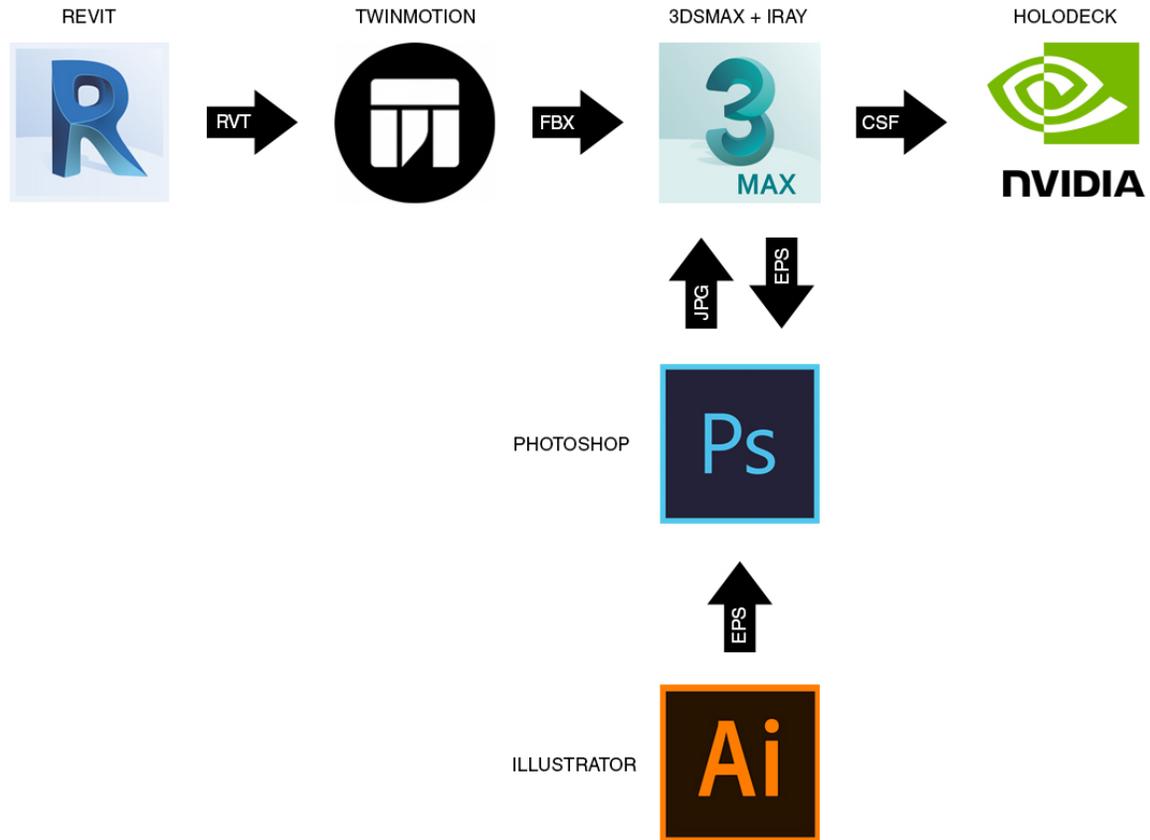
Case Studies

Until now, VR experiences were more one-sided, presentation-like and for the consumption of an audience with limited access to navigate spaces. With holodeck, everyone can join in in a the virtual world without having to physically displace and do all that one usually does with a design charrette and more. While F2F interaction is invaluable, Holodeck comes as close as I have seen to being social and even reading body language. It is truly immersive and unlike most solutions out there, non-isolating. Holodeck helps us reduce physical barriers, excessive design iterations, the need for expensive mock-ups and speeds up time to market translates into time/cost savings. Being able to make changes on-the-fly-changes, in an unparalleled photo-realistic fashion, enhances our communication, creative process and decision making. From a more altruistic perspective, I view holodeck as and education enabler. Today, our studios have early design pin-ups to display design process and invite feedback from young architects. I envision virtualizing the experience, extending participation to all offices and helping us in our vision of being at the forefront of a design culture, enabled by state-of-the-art-technologies.