



CANNONDESIGN





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



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**#3 US Education Firm** *Building Design + Construction*

**#6 Global Health Firm** *World Architecture 100*

**#8 Science + Technology Design Firm** *World Architecture 100*

**#16 Top Design Firm** *Architect 50*

**Top 10 Innovative Arch. Firm in the World** *Fast Company*

**Top 25 Office Design Firm** *Building Design + Construction*

**Top 10 US Interiors Firm** *Interior Design Magazine*

**Top 10 Engineering Firm** *World Architecture 100*

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**500+**

total design awards won  
in the last 15 years

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**900+**

designers

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FASTCOMPANY

**TOP 10**

**MOST INNOVATIVE  
ARCHITECTURE FIRM  
IN THE WORLD**



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## Hilda Espinal, AIA, LEED AP+C, CDT, MCSE

Hilda Espinal is CannonDesign's Chief Technology Officer, responsible for the evolution and implementation of the firm's emerging technologies through leveraging computational tools and workflows, digital intelligence, immersive realities, building information modeling, and advanced building analysis and visualization. A licensed architect and technology leader for more than 16 years, she helps clients and project teams around the world leverage technology and intelligent data to make informed decisions early in the design process — reducing risk and maximizing the impact of investments.

Hilda sits on the national board of directors for Women for Economic Leadership and Development (WELD), is the chair for CannonDesign's Diversity + Inclusion Council and is very involved in multiple partnership in the technology space. She is a Microsoft-certified systems engineer, a regularly speaker at both national and international industry events, and has been active in the Autodesk Executive Council, Builtworlds Hackathon Judges panel, Mars Home Urbanization Challenge and the AIA's CIO/CTO Large Firm Roundtable. In 2016, Hilda was named one of the "Top Women in Technology" by the Dallas Business Journal.





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# HOLODECK @ CANNONDESIGN:

ENHANCING THE DESIGN PROCESSES...



# IMMERSIVE EXPERIENCE : PROPORTION + FEEL





## IMMERSIVE EXPERIENCE : NAVIGATION





# IMMERSIVE EXPERIENCE : **PHOTOREALISM**





# INTERACTIVE : SPATIAL AWARENESS





# INTERACTIVE : ANNOTATION





## SOCIAL : SEEING + HEARING THE SAME...





## SOCIAL : INCREASED COMFORT





# SOCIAL : READING BODY LANGUAGE + CUES



## PREDICTIVE : SEEING THE UN-SEABLE





# COLLABORATIVE : FOR THE DESIGN TEAM



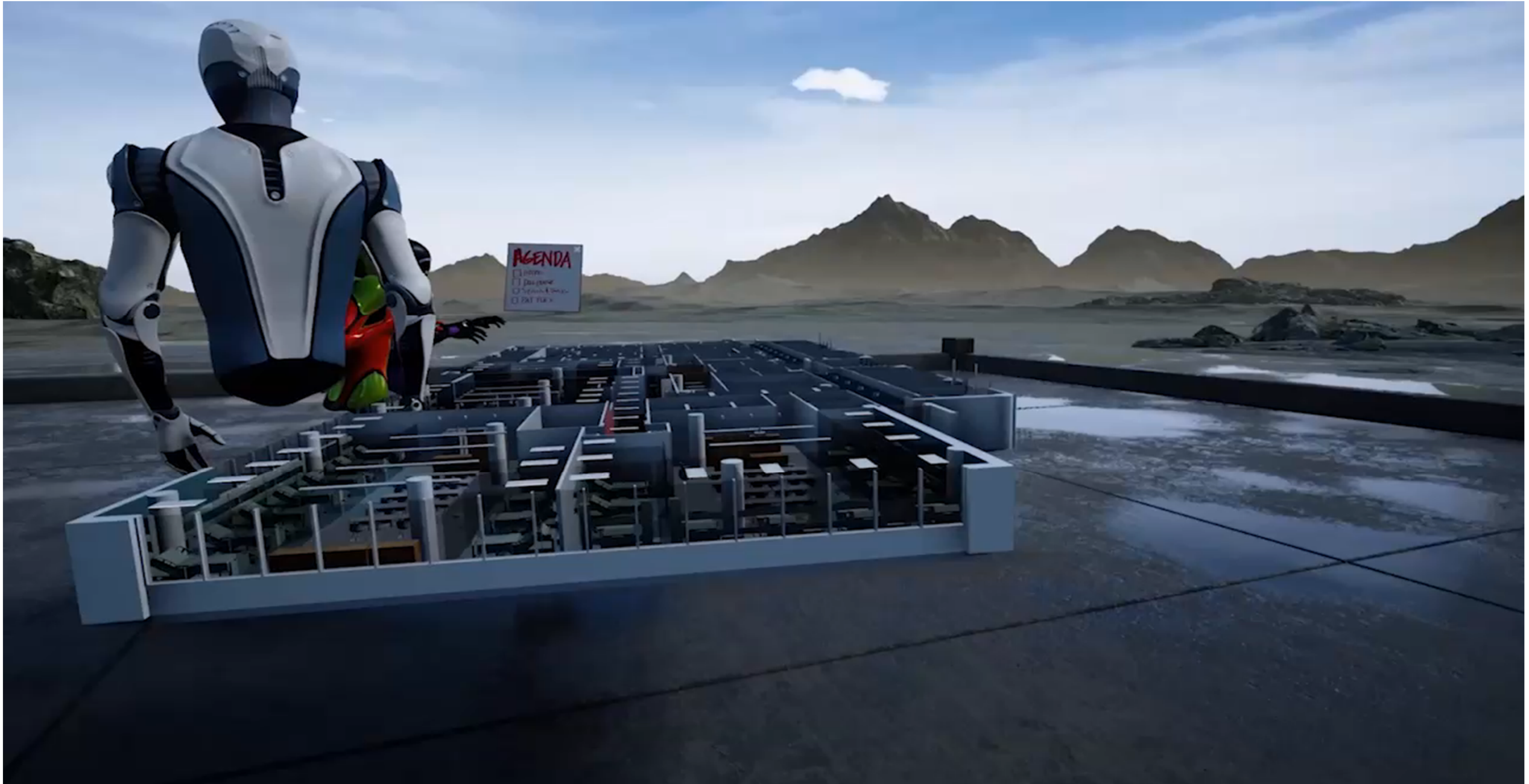


# COLLABORATIVE : FOR THE DESIGN TEAM





# COLLABORATIVE : **FOR THE CLIENT !!!**



# HOLODECK @ CANNONDESIGN:

THE OPERATIONAL CASE...



# A GLOBAL + INTEGRATED PRACTICE...



**19 OFFICES  
WORLDWIDE (AND GROWING!)**

**1000+  
CANNONDESIGNERS**



# SINGLE FIRM MULTIPLE OFFICES (SFMO)



## **Reduce Geographical Barriers**

Design teams are primarily in the USA and Amsterdam. Consultants are geographically dispersed.

# RETURN ON INVESTMENT



## Cut Expenses

We foresee reducing travel costs and avoiding expensive change orders, due to miscommunication.



# TIME SAVINGS

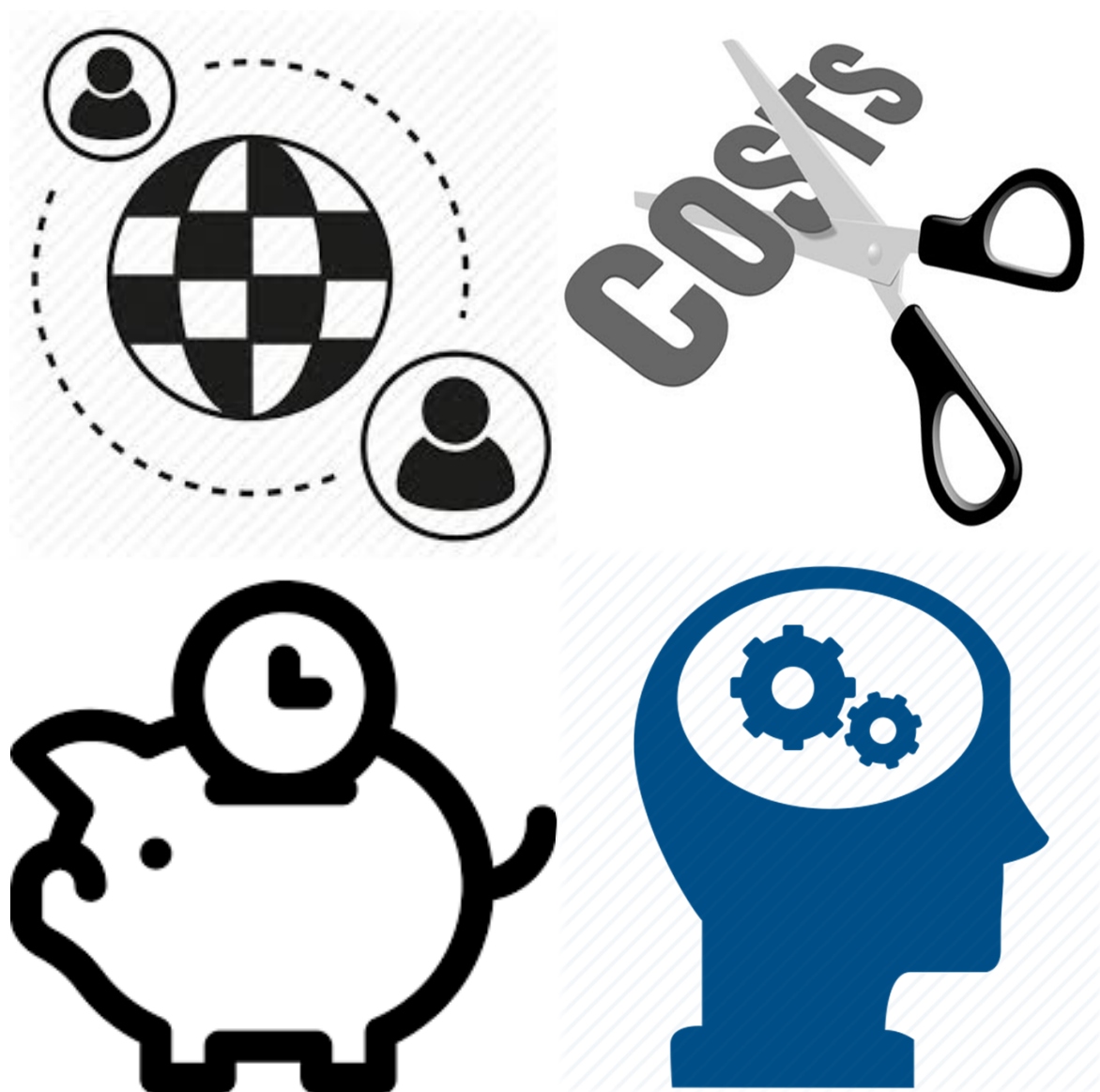


## Reduce Time

By being in the same virtual space, to make decisions and test them, in real-time, and with all stakeholders present.



# MEETING (OR SURPASSING) CLIENT EXPECTATIONS



## Stay True to Client's Vision

Client is very interested in using the technology in their exhibit space and lab. It is a state of the Art Technology space, after all!



# HOLODECK @ CANNONDESIGN:

THE STRATEGIC CASE...

# COMPETITIVENESS



**Virtual reality** is increasing demand; expected in most cases.



# DIFFERENTIATOR



**Technology** innovation is growing as competitive advantage.

# SHAPING HOLODECK

CANNONDESIGN'S COLLABORATION WITH NVIDIA



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## Ernesto Pacheco, Firm Visualization Leader

VizNet is led by Ernesto Pacheco, who was recently promoted to the role of Firm Visualization Leader. In this role, Ernesto directs the development and management of digital graphic resources throughout CannonDesign for design visualization, from still renderings to animations and immersive technologies (VR,AR,XR) and promotes our capabilities to enhance visual communication and presentation deliverables.

Ernesto Pacheco leverages expert knowledge of visualization applications in supporting project teams and pursuits. As the Firm Visualization Leader at CannonDesign, Ernesto is a “Go-to” person for all project related aspects of visualization. He is primarily responsible for research and implementation of new technologies into the visual communications process. Ernesto 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 and has worked on several high-profile projects since joining CannonDesign. Most recently, Ernesto has been a key participant to the Holodeck partnership between CannonDesign and NVIDIA to develop tools geared towards Architectural Design.

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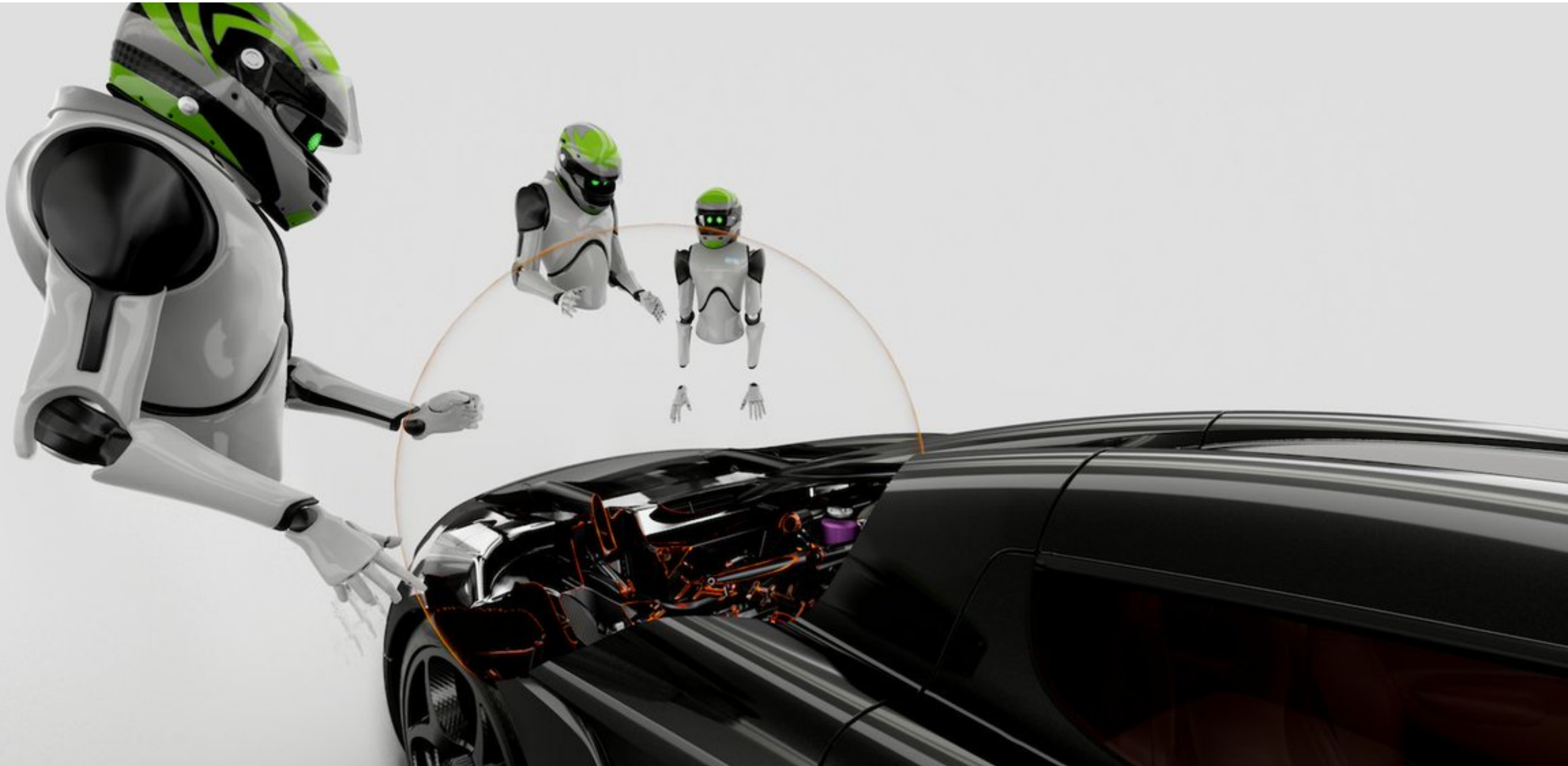
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# HOLODECK: THE BEGINNING



# HOLODECK: Early access...



DESIGN & VISUALIZATION INDUSTRIES ▼ PRODUCTS ▼ SOLUTIONS ▼ TECHNOLOGIES ▼ FOR DEVELOPERS

Thank you for applying to NVIDIA Holodeck Early Access.

If selected, you will be notified about the next steps via email.

NVIDIA HOLODECK

## Products

- Quadro in Desktop Workstations
- Quadro in Mobile Workstations
- Quadro in Specialty Solutions

## Resources

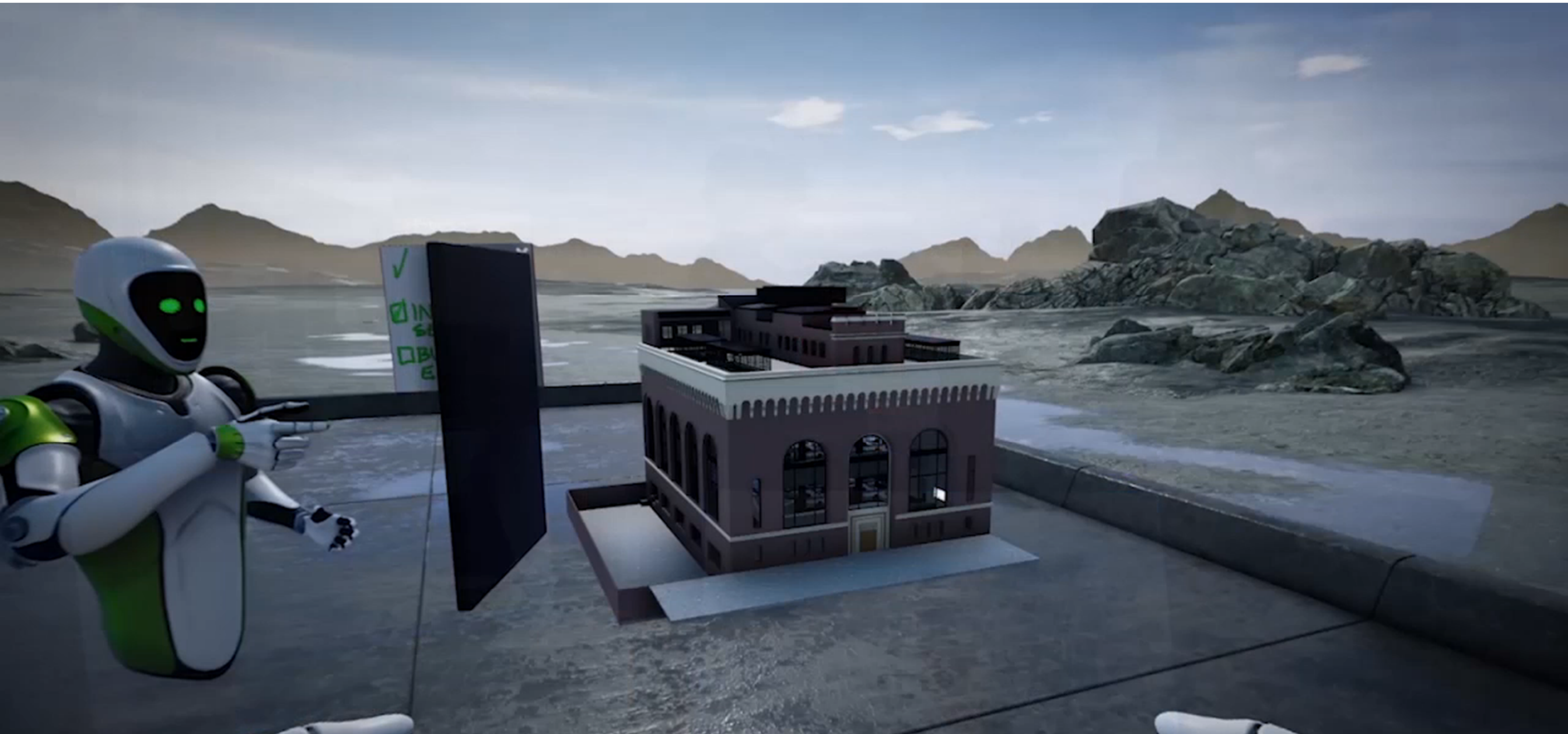
- Quadro Product Literature
- Virtual GPU Product Literature
- Customer Success Stories

## Community

- NVIDIA GRID Community Advisors
- Virtual GPU Forum
- Advanced Rendering Forum



# HOLODECK: THE BEGINNING



## PROJECT WIN: SCITECH SCITY

"Scity" (pronounced "city") is a **city infused with science and scientific creativity**. SciTech Scity is a collaboration between the City of Jersey City and Liberty Science Center, New Jersey's most visited cultural institution, to bolster local education and economic growth in key STEM sectors.



WHERE THE FUTURE  
COMES ALIVE



# Recommendations for AEC Use

- Video and 360 image output
- Scale factors (Holotable)
- More live section options
- Sun Studies (Holotable)
- Saved views (Holotable via Beacons)
- Sketch on geometry
- Call in from desktops (Google Hangouts support)

**IT'S MY OFFICE, IT'S OUR MODEL!**

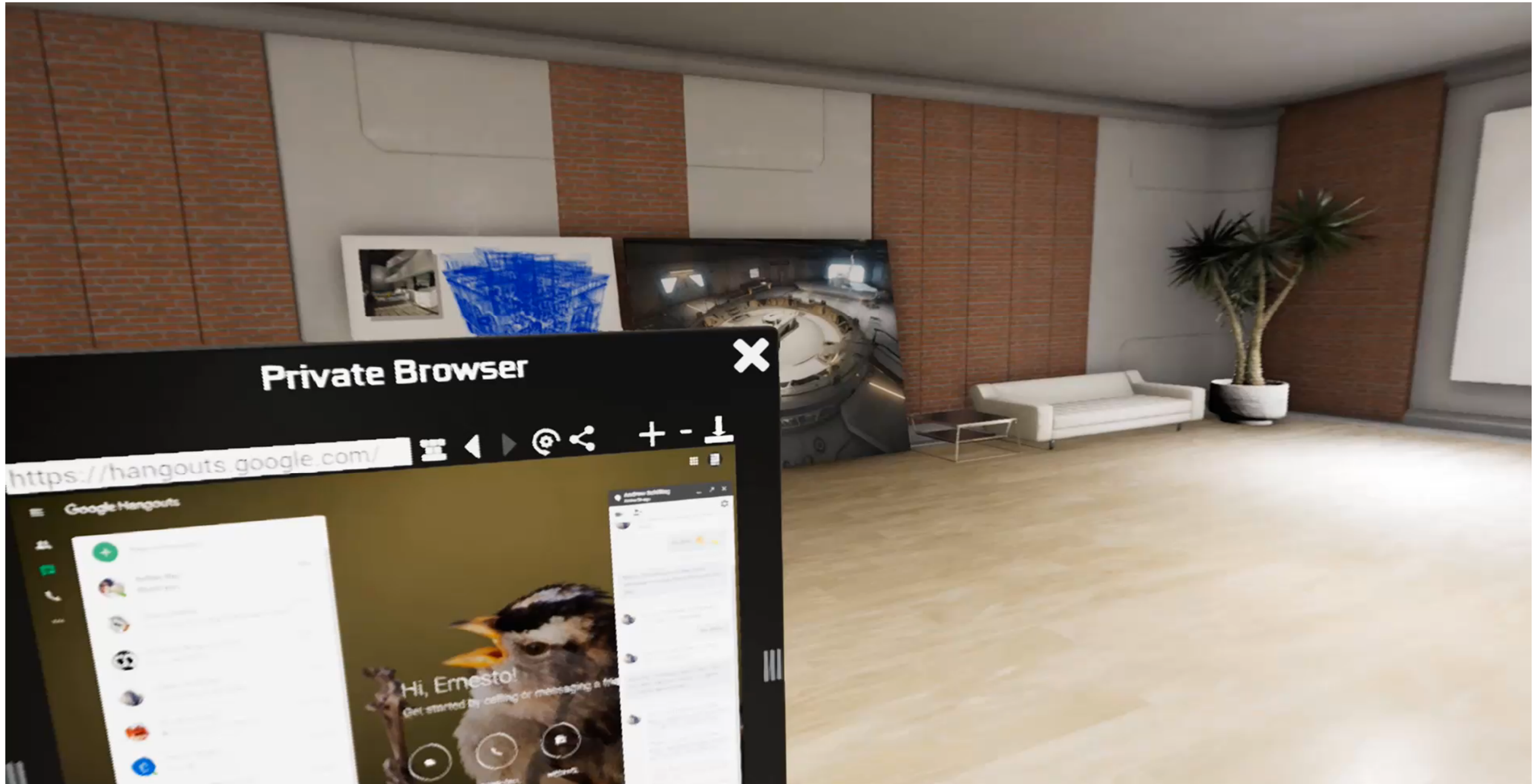




# HOLODECK @ CANNONDESIGN

WORKFLOWS + BEST PRACTICES

# INCLUSIVE PARTICIPATION: GOOGLE HANGOUTS





# GUIDE YOUR AUDIENCE...



# CAPTURE CHANGES





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## BEST PRACTICES

- Holodeck's UI and tools are intuitive
- It is a stable Multi-User VR platform
- 3dsmax + IRay required
- One mesh per interactive object
- Pivot placement is important
- For custom texture maps use Asphalt (AEC/Ground)
- Center to origin

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## Andrew Schilling, Chief Infrastructure Officer

As our information technology leader, Andrew is responsible for developing and maintaining a complete technology infrastructure that aligns with our firm's broader goals to remain a leader in the industry. In this role, he has been integral in setting up our state-of-the-art data center and transitioning our firm into a virtual environment where employees can access their files and workstations from anywhere. He also oversees our robust team of in-house IT personnel — ensuring our information systems and staff are supporting our firm's operational needs and goals.





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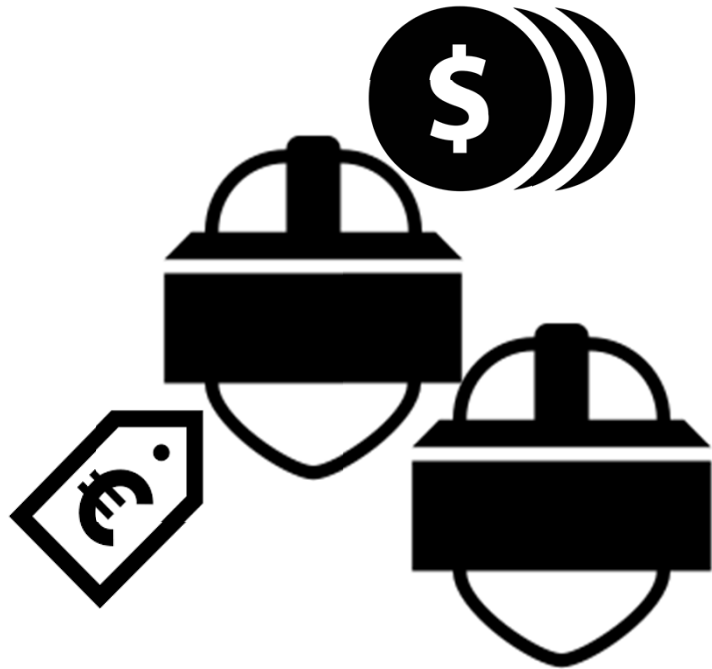
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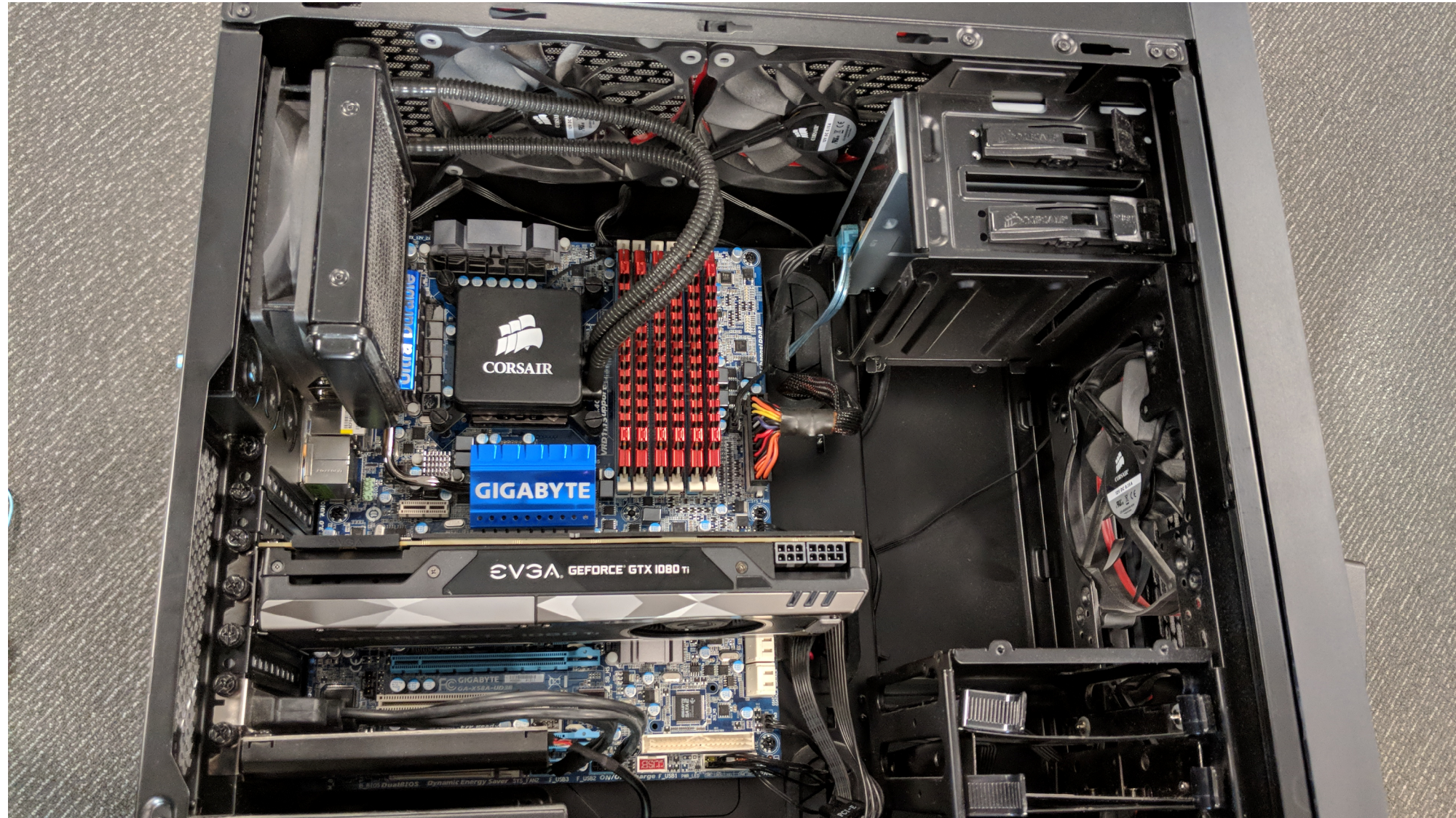
## LESS THAN IDEAL EXPERIMENTATION

- Software and Hardware were prohibitively expensive.
- Visuals were not photo-realistic.
- Collaboration with Avatars was not natural.



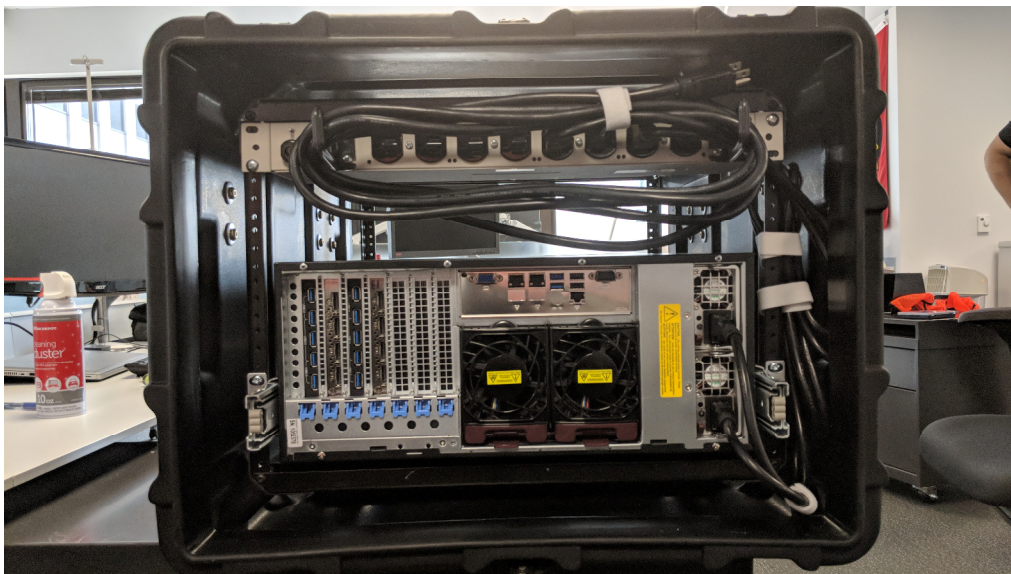


# HOME GROWN APPROACH...





# TODAY'S IMPLEMENTATION





# Next Generation Multi-user



**NEXT?**

**DEVELOPMENT POTENTIAL..**



## WISH LIST...

- Augmented Multi-Sensory Experiences
- Enhanced Simulation
- Virtual Coordination
- Deep Learning by Immersion
- Revit and Rhino Integration
- Roundtrip Changes with Authoring Software

## WISH LIST...

- Multi ID material support
- Customizable environments
- Physics
- Customizable MDL library
- IES lights support
- Rhino plugins
- Snaps and grid system



**WISH LIST...**

**OTHERS?**

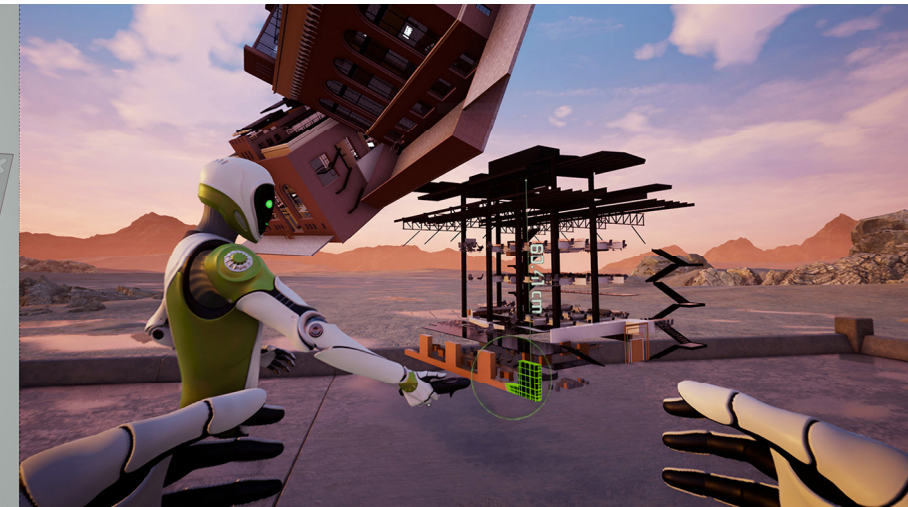
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**THANK YOU !**