

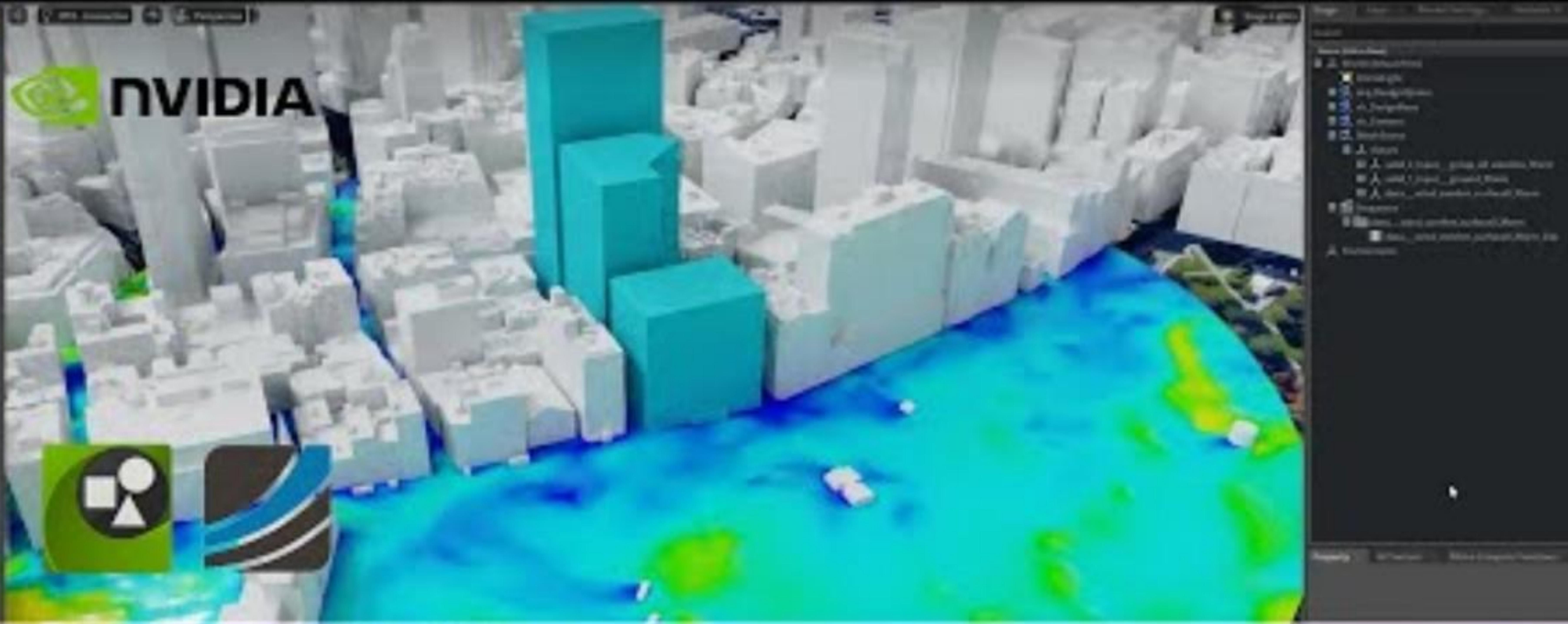


NVIDIA Omniverse 활용한 건설 산업 Digital Twin 우수 사례

정구형 팀장, Solutions Architect, NVIDIA | 2025년 9월

Virtual Workshop





Omniverse Workflow

SimScale Extension for AECO

Visualize Wind Simulation



HEXAGON



Reality Cloud Studio

powered by HxDR

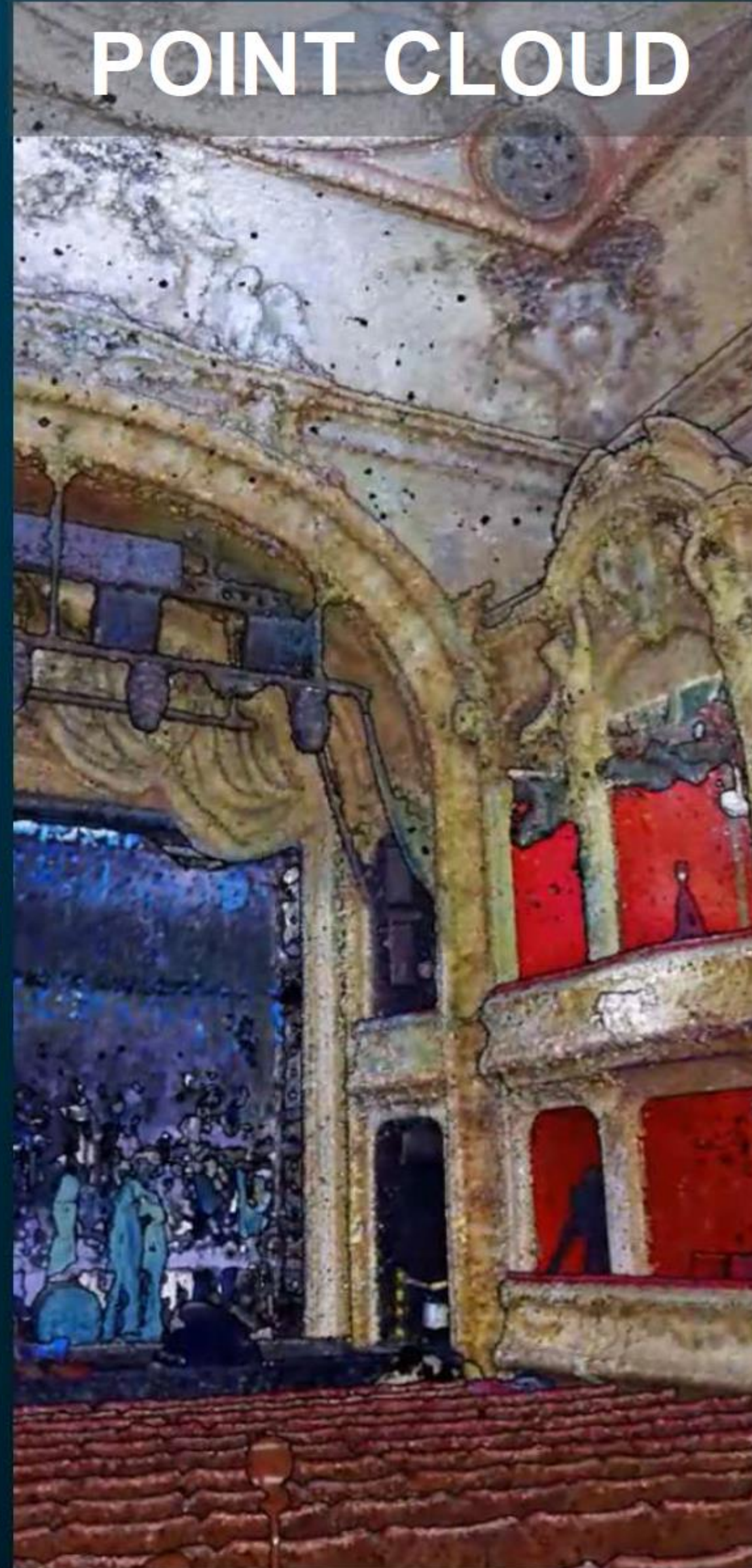


**NVIDIA
Omniverse™**

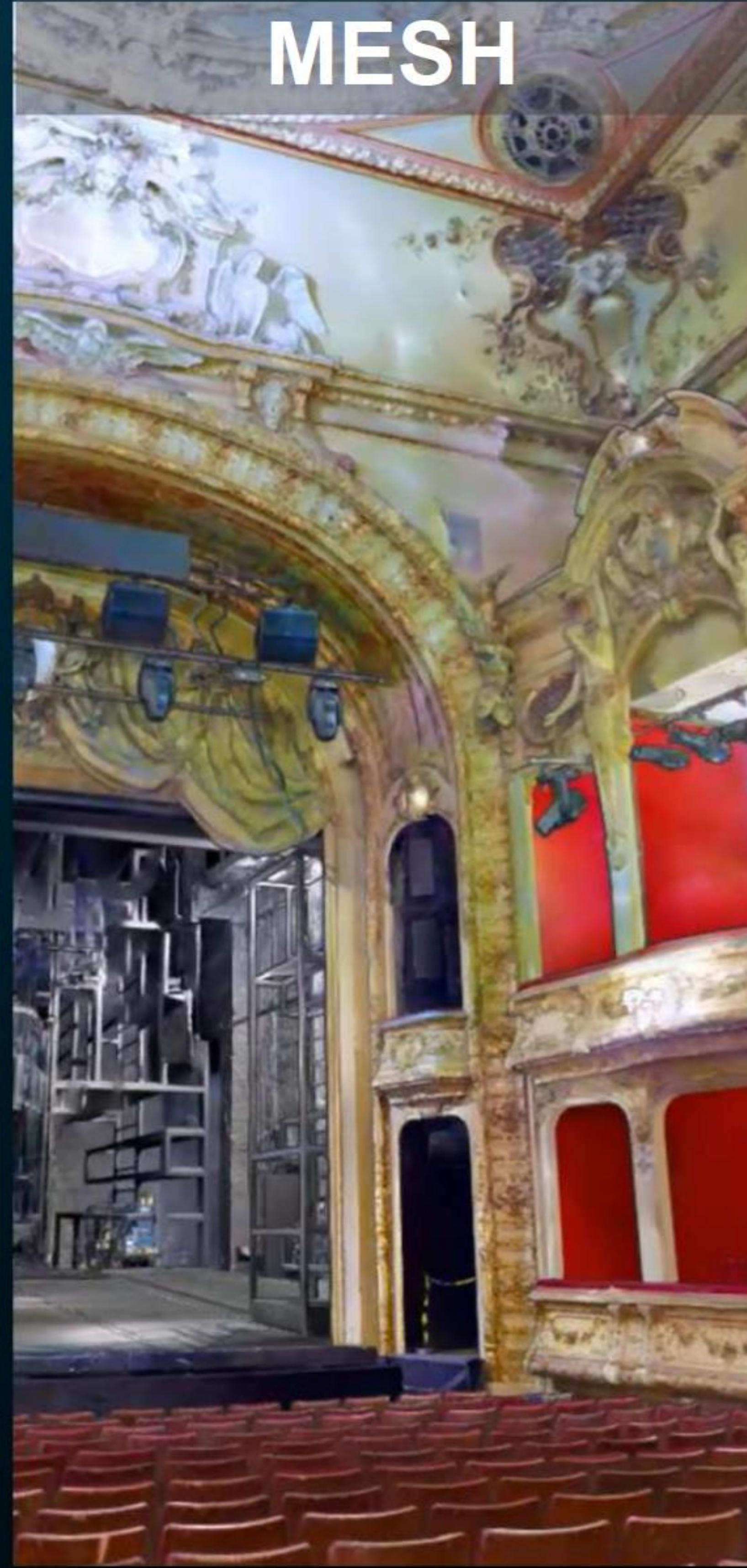
SCAN



POINT CLOUD



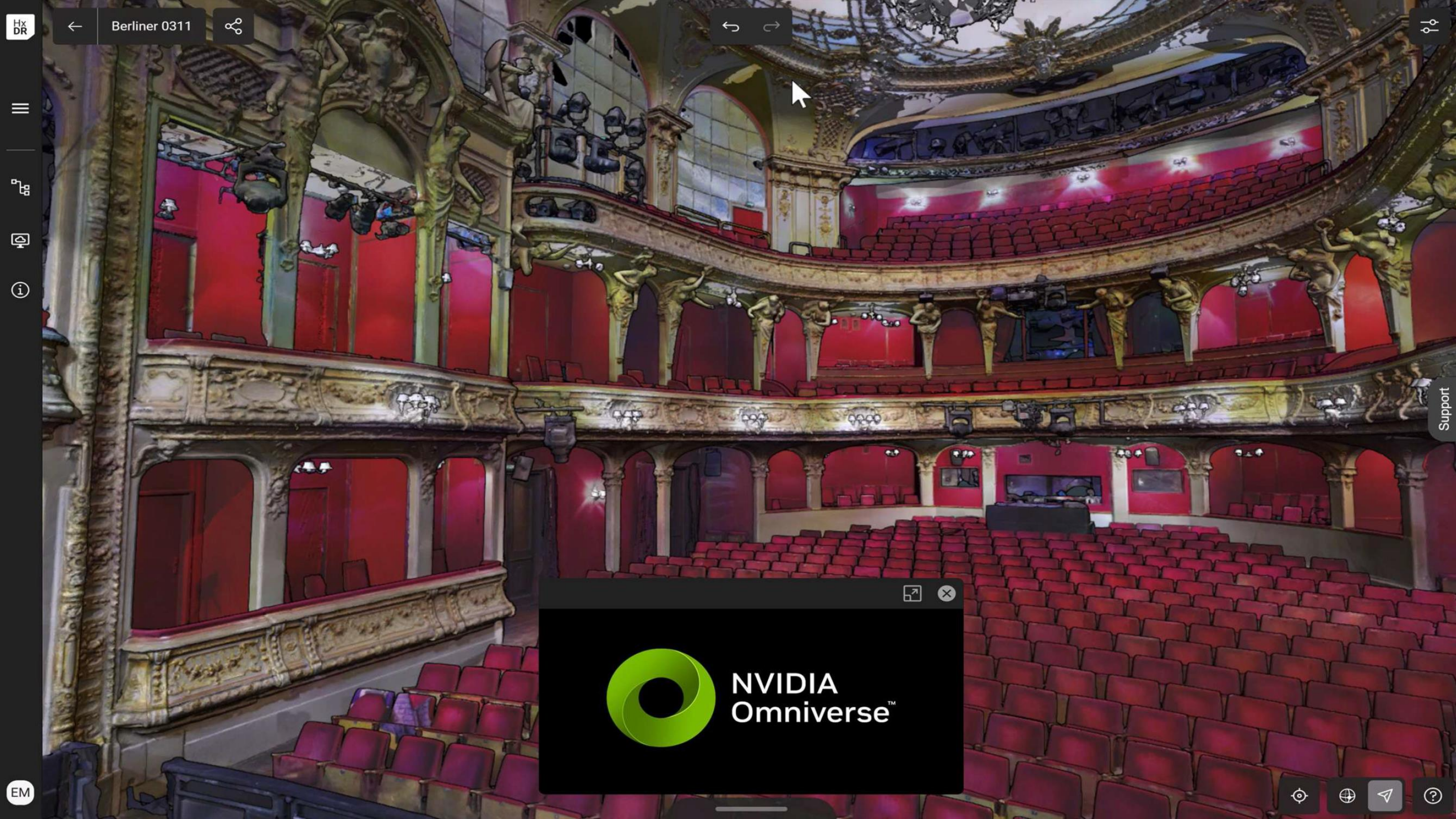
MESH



RENDER



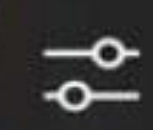




Hx
DR



Berliner 0311



Support

EM



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Omniverse Connections

- 3ds Max

▼
- Alias

▼
- Archicad

▼
- Blender

▼
- CAD Converter

▼
- Creo

▼
- FBX convert to USD

▼
- glTF convert to USD

▼
- Houdini

▼
- Maya Connectors

▼
- ParaView

▼
- Revit

▼
- Rhino

▼
- SketchUp

▼
- Substance 3D Painter

▼
- Unreal Engine

▼

USD Connections Overview

OpenUSD Connections and Data Exchange, formerly Omniverse Connect, is a collection of [importers](#), [exporters](#), [converters](#), and [USD file format plug-ins](#) that enable various 3D applications, products, and file formats to exchange data using the Universal Scene Description (OpenUSD or USD) format. When data is in OpenUSD, you are connected to Omniverse technologies alongside the most popular 3D apps and tools on the market, enabling advanced workflows and superior collaboration that only OpenUSD can provide.

OpenUSD Exchange SDK

The [OpenUSD Exchange SDK](#) accelerates OpenUSD development by helping engineers design and develop their own USD I/O solutions that produce consistent and correct USD assets across diverse 3D ecosystems.

It provides higher-level convenience functions on top of lower-level USD concepts, so developers can quickly adopt OpenUSD best practices when mapping their native data sources to OpenUSD-legible data models.

USD Ecosystem Solutions

We encourage our customers to utilize the native OpenUSD support integrated into the ISV-developed Applications.

Applications with native OpenUSD file format support
Autodesk USD for Maya
Autodesk 3ds Max USD
Autodesk Alias AutoStudio USD
Adobe Substance 3D Painter USD

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OpenUSD Exchange SDK

[USD Ecosystem Solutions](#)

[Omniverse Converters and Extensions](#)

Set up your own cloud-native simulation in minutes.

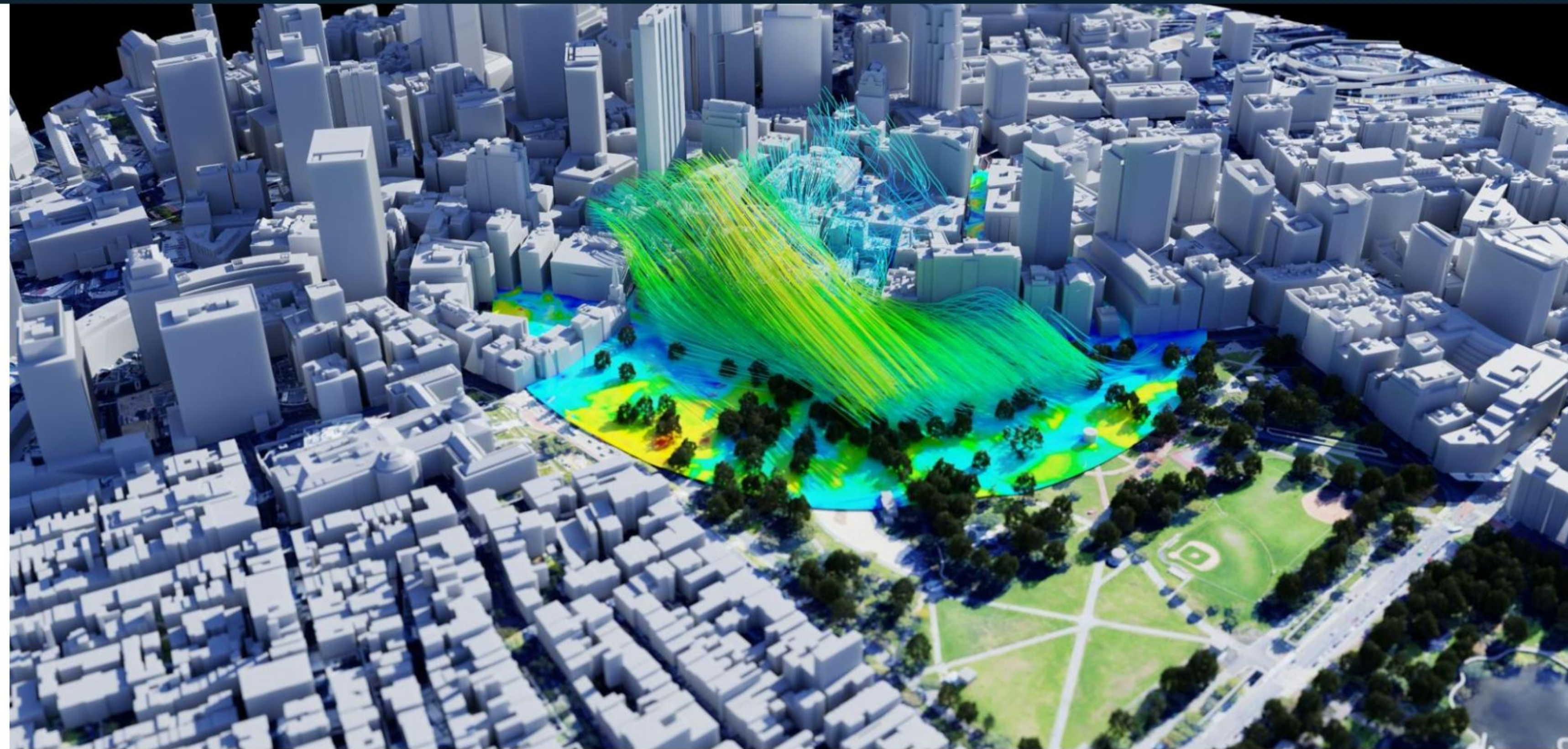
[Start Simulating Now](#)[Architecture](#)[Computational Fluid Dynamics \(CFD\)](#)[Pedestrian Wind Comfort \(PWC\)](#)[Wind Simulation](#)

Figure 1: CFD-generated wind simulation results visualized in NVIDIA Omniverse™

NVIDIA Omniverse™ SimScale Converter Extension: Seamlessly Export Scenes and Results Between Tools

The NVIDIA Omniverse™ SimScale Converter Extension is a powerful tool that allows architects and computational designers and users of the NVIDIA Omniverse™ tool to seamlessly export scenes from Omniverse™ to SimScale and bring back the results into Omniverse™. This can be a valuable asset for a variety of projects, as it allows users to quickly and easily iterate on designs and test different scenarios.

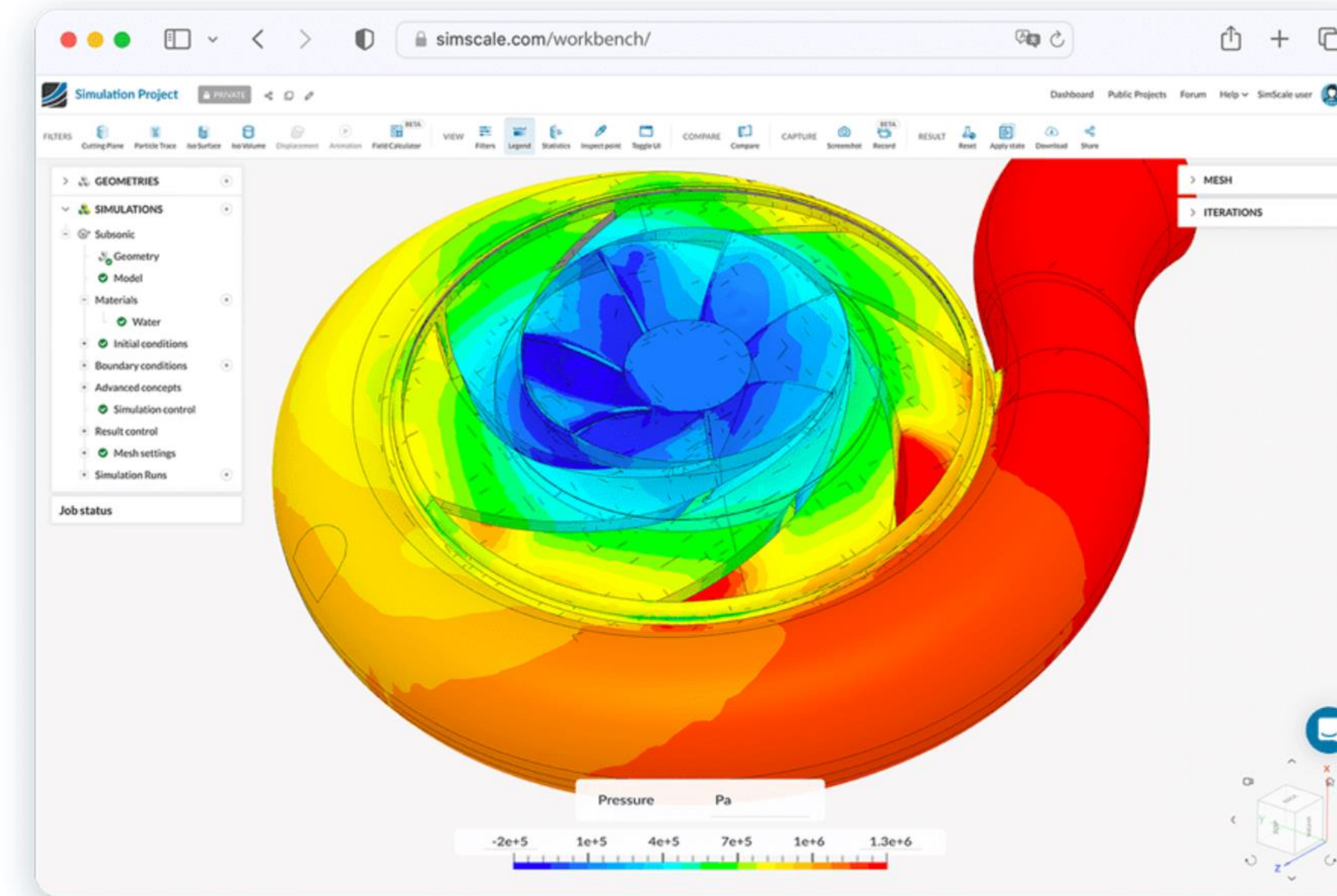
To use the extension, simply upload your USD prims as models to SimScale. SimScale will then run a [computational fluid dynamics \(CFD\) simulation](#) on your model and return the results back to Omniverse™. The results can then be visualized and analyzed in Omniverse™, allowing users to



FLUID DYNAMICS

Cloud-based engineering platform for fluid dynamic simulation

Start Simulating Now



Zaha Hadid Architects

easee

MITSUBISHI

RIMAC

MAGNA

Thornton
Tomasetti

SWECO

Aqseptence
Group

Johnson & Johnson

What is SimScale CFD?

SimScale's CFD software can analyze a range of problems related to laminar and turbulent flows, incompressible and compressible fluids, multiphase flows, and much more. With everything 100% in the web browser, the barriers of limited computing power, accessibility, and high costs are eliminated.

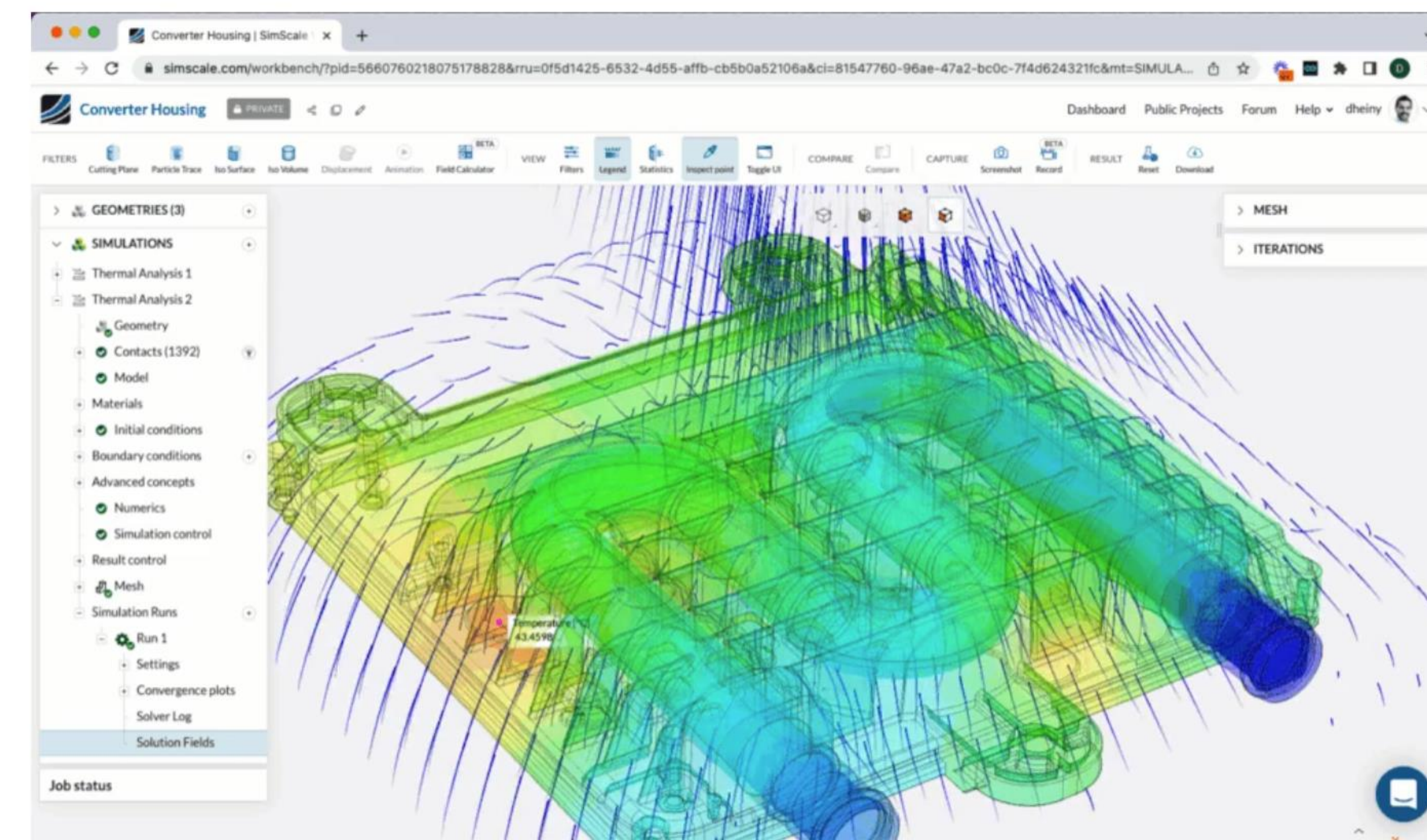


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Bridges

Converters

Asset Importer

CAD Converter

3MF Converter

GeoJSON Converter

Open Geospatial Consortium
(OGC) Map Tile Loader

SimScale Converter

Onshape importer

Design

Digital Twins

Materials

OmniGraph

Product Configurator

Programming

Replicator

Simulation

Streaming

Utility

Asset Converter

[Home](#)
[> Converters](#)
[> SimScale Converter](#)

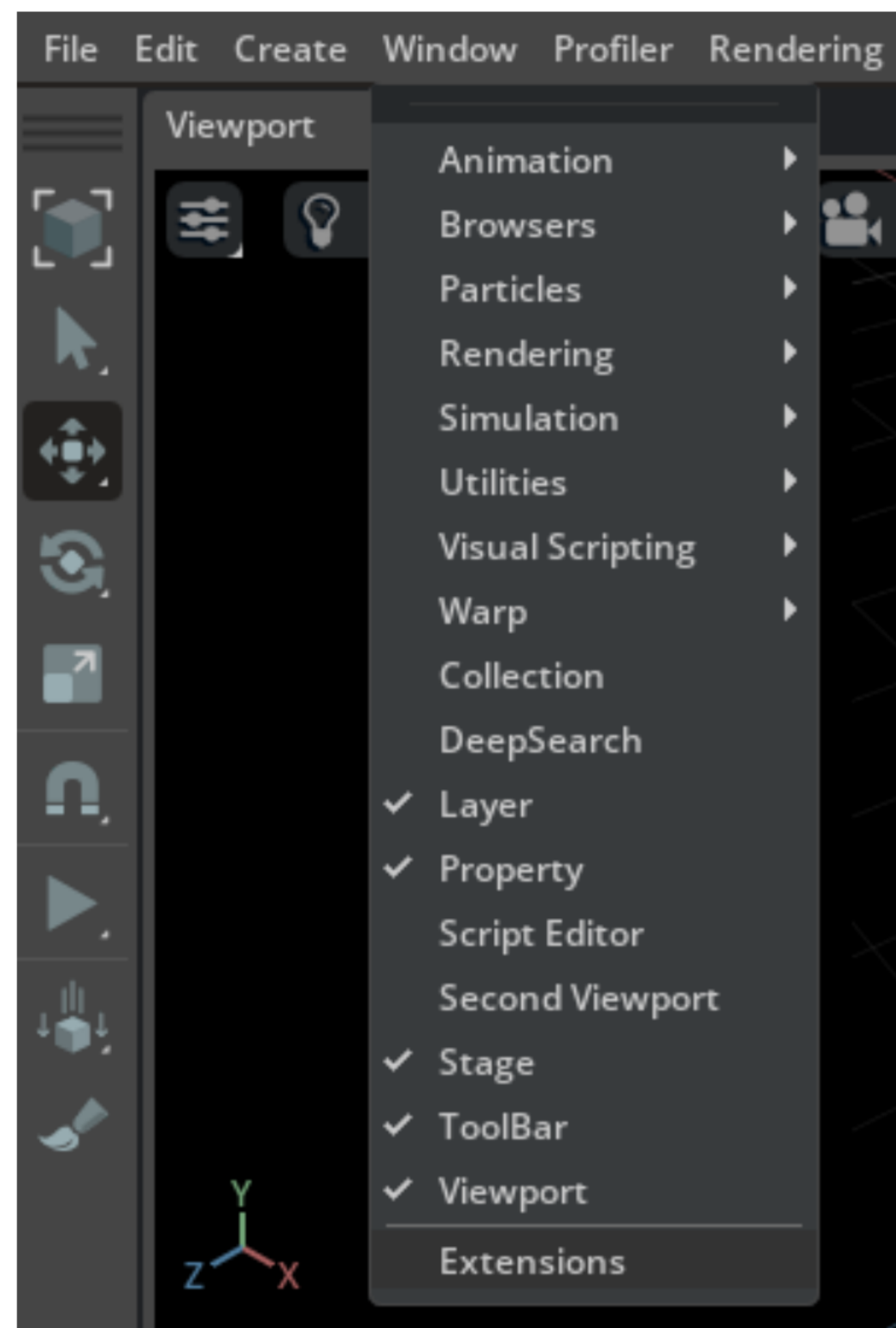
SimScale Converter

With the NVIDIA Omniverse™ SimScale Converter Extension, you can upload [USD prims](#) as models to SimScale and bring Computational Fluid Dynamics and Finite Element Analysis simulations into Omniverse.

Installation Instructions

The SimScale Converter Extension is not enabled by default in Omniverse USD Composer and will need to be enabled for use.

1. Open Omniverse USD Composer and click on **Window -> Extensions** to open the [Extensions Manager](#).



2. Install and enable the SimScale Converter Extension

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Asset Converter

User Interface

A floating SimScale window is shown after toggling on the **SimScale (Beta)** option.



Below is a description of each feature and more details are covered in the following sections.

Element	Description
Import From Disk	Imports a downloaded case from user specified folder
Dashboard	Directs user to SimScale Dashboard Web UI.
Login	Allows Extension to query SimScale data with an API Key.
Project	A combo box that shows available projects for the user account upon login.
Workbench	Opens the selected project in SimScale Workbench Web UI.
Refresh	Queries latest data from SimScale and refreshes the GUI.

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Extensions

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- Bridges
- Converters
- Design
- Digital Twins
- Materials
- OmniGraph
- Product Configurator
- Programming
- Replicator
- Simulation
 - Physics Core
 - Clash Detection
 - Fluid Dynamics
 - PointClouds
- Streaming
- Utility
- 3rd Party

Omniverse Common

- Formats
- Technical Requirements

Extensions Overview

Omniverse Extensions are the core building blocks of [Omniverse Kit](#)-based Apps. These make up the individual tools you use within [USD Explorer](#), [USD Composer](#), and other Apps. Because Kit-based Apps are composed of Extensions, you can extend the functionality of the Apps you use to meet your needs by creating new Extensions or editing or activating existing ones.

List of Extensions

For convinience, below is a table of all Omniverse user extensions (Extensions that have a user interface).

It should be noted that this list of Extensions is not complete and more developer extensions can be found in the [Kit developer documentation](#).

Click to see all user extensions

Search to filter table...

[3MF Converter](#)

[Animation Constraints \(beta\)](#)

[TimeSample to animation Curve](#)

[Animation Deformers](#)

[Animation Graph](#)

[Motion Path \(beta\)](#)

[Animation Retargeting](#)

[Skeletal Animation](#)

[Animation Timeline and key frames](#)

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[List of Extensions](#)

[Build your own Extensions](#)

NVIDIA Omniverse 플랫폼 이해 및 활용

NVIDIA Omniverse

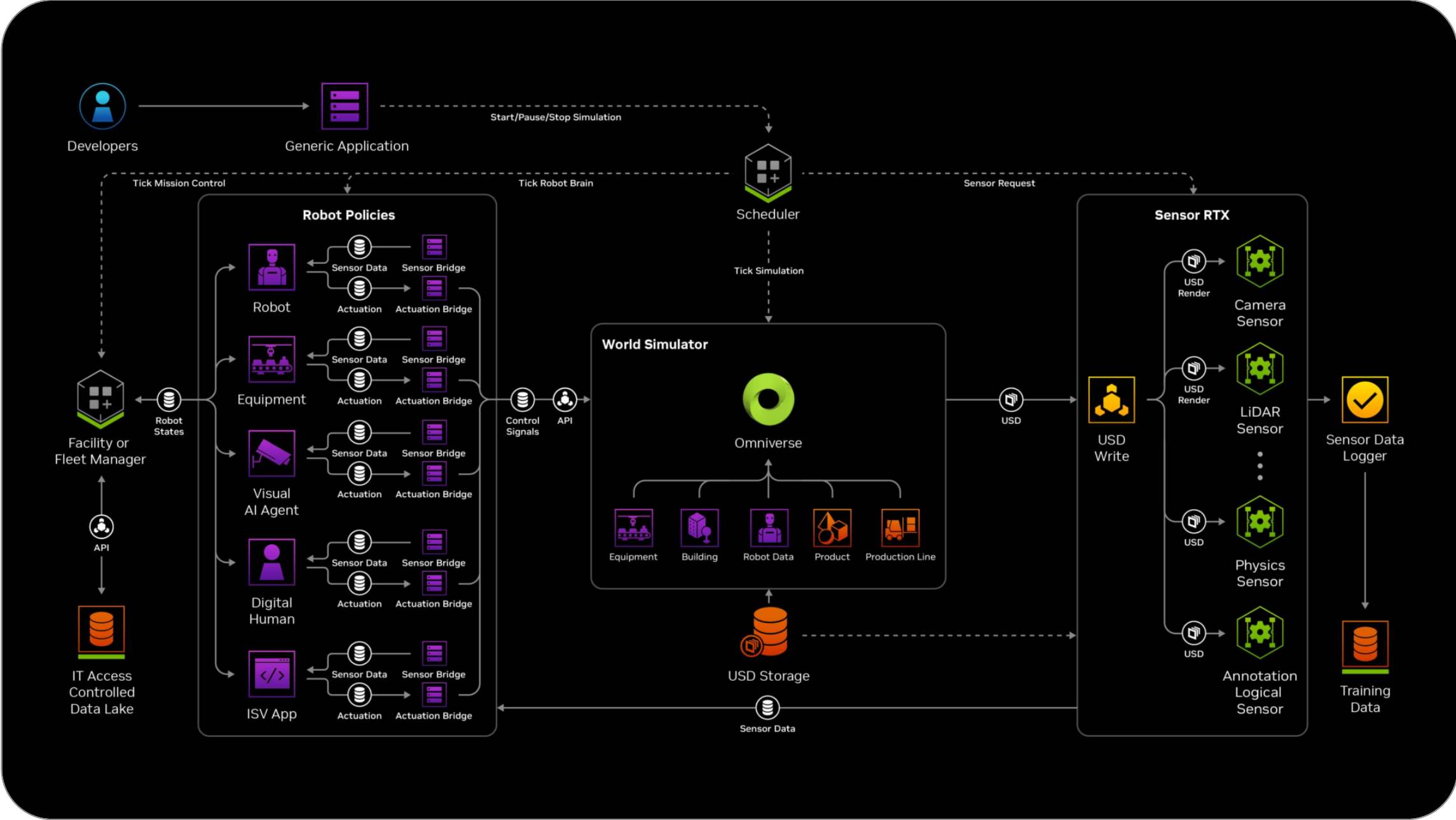
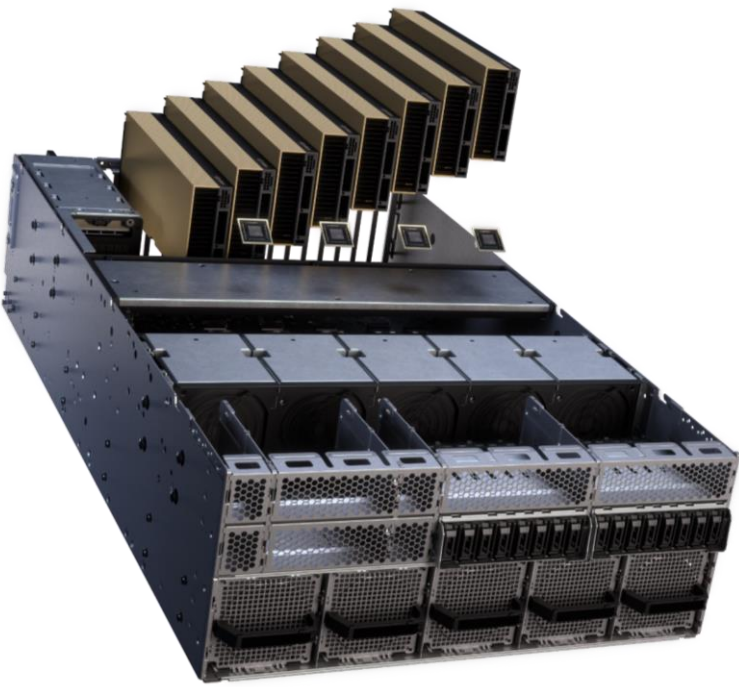
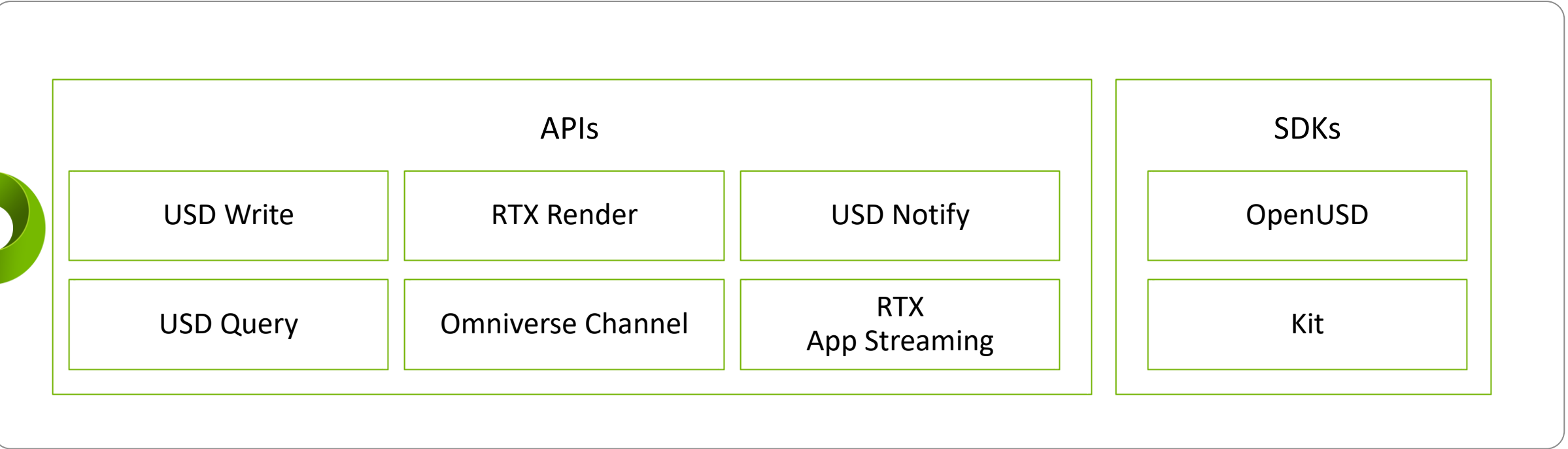
Open libraries, SDKs, APIs for industrial and physical AI simulation

Available as open developer blueprints & libraries on GitHub

3rd Party Applications



NVIDIA Omniverse Libraries and APIs



[kit-app-template](#) Public

Omniverse Kit App Template

Python 605 184

[web-viewer-sample](#) Public

This sample demonstrates how a front-end client can present a streamed Omniverse Kit application and how to send messages between the two apps.

TypeScript 78 22

[usdsearch-client](#) Public

Client library for USD Search and Asset Graph Search API's

Python 8 3

[usd-exchange](#) Public

OpenUSD Exchange SDK

Python 35 5

[configurator-viewer-sample](#) Public

React App sample configurator project informing developers on the Omniverse Platform how to make use of the Omniverse WebRTC Streaming Library. It shows how to initiate a stream and communicate wit...

TypeScript 11 5

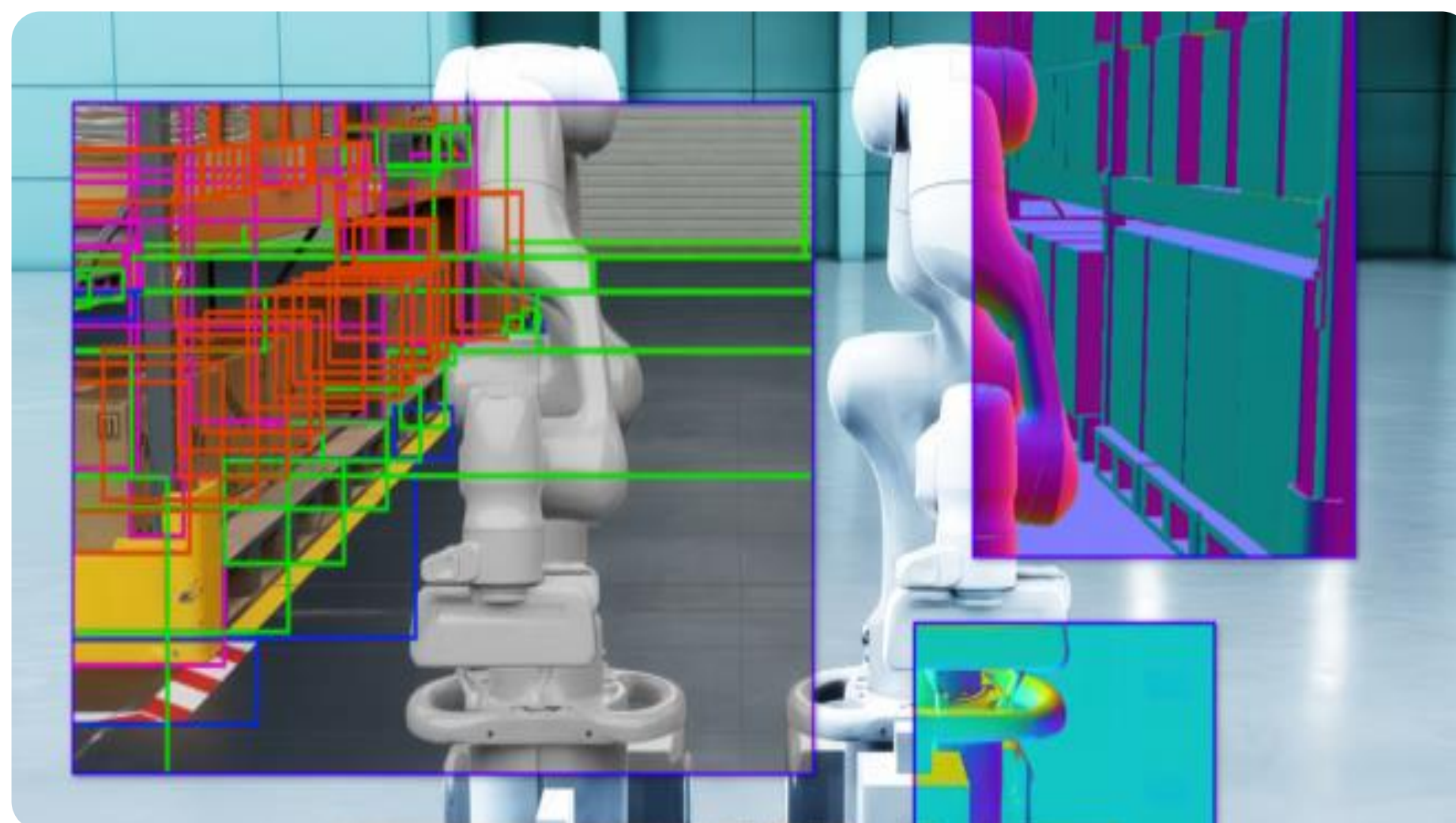
[usdsearch-samples](#) Public

A collection of kit samples for interfacing with USD Search API.

Python 10 1

Omniverse Libraries for World Composition

Build and deploy industrial AI and robotics simulation applications



OpenUSD Exchange SDK
Seamless Data Interchange



Omniverse Kit
RTX Rendering & Simulation



Simulation-Ready Libraries
Synthetic Data & Sensor Simulation






Available on GitHub

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- MDL Material Search Path
- Material Graph 

Suggested Minimum Requirements by Product

Nucleus

For Enterprise Nucleus Server requirements, please refer to this [page](#)

Applications and Application Templates

Product	Supported Operating Systems	Min CPU: (intel/amd)	Min Ram	Min GPU	Min Disk
Kit	<ul style="list-style-type: none">Windows 10/11Ubuntu 20.04/22.04	<ul style="list-style-type: none">Intel i7 Gen 5AMD Ryzen	16GB	GeForce RTX 3070	250GB
Streaming Client	<ul style="list-style-type: none">Windows 10/11Ubuntu 20.04/22.04CentOS 7	<ul style="list-style-type: none">Intel i3 Gen 7AMD Ryzen	2GB	N/A	1GB
Isaac Sim	<ul style="list-style-type: none">Windows 10/11Ubuntu 20.04/22.04	<ul style="list-style-type: none">Intel i7 Gen 7AMD Ryzen 5	32GB	GeForce RTX 3070	Data Footprint + 20%
XR	<ul style="list-style-type: none">Meta Quest 2HTC Vive ProWindows 10/11Ubuntu	<ul style="list-style-type: none">Intel i9 Gen 12AMD Ryzen TR Gen 3	64GB	<ul style="list-style-type: none">GeForce RTX 3090Quadro A6000	1TB


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- Driver Versions
- NVIDIA RTX GPU Recommendations for Professional Workstation Users
- NVIDIA RTX GPU Recommendations for Studio Users
- Omniverse RTX Renderer Feature Support

Suggested Minimum Requirements by Product

Nucleus

Applications and Application Templates

 **Note**

NVIDIA RTX PRO 6000 Blackwell Workstation Edition

Ultimate performance in a single GPU solution for professionals



Workstation performance reimagined for the AI era

- 4000 AI TOPS
- 96GB GDDR7 of GPU Memory
- 600W TGP
- 4x NVENC, 4x NVDEC, 4:2:2 support
- Up to 4x MIG instances

Availability Starting April 2025

RTX PRO 6000 Blackwell Server Edition

The most powerful universal GPU for
AI and visual computing in the data center

Breakthrough Multimodal AI Inference

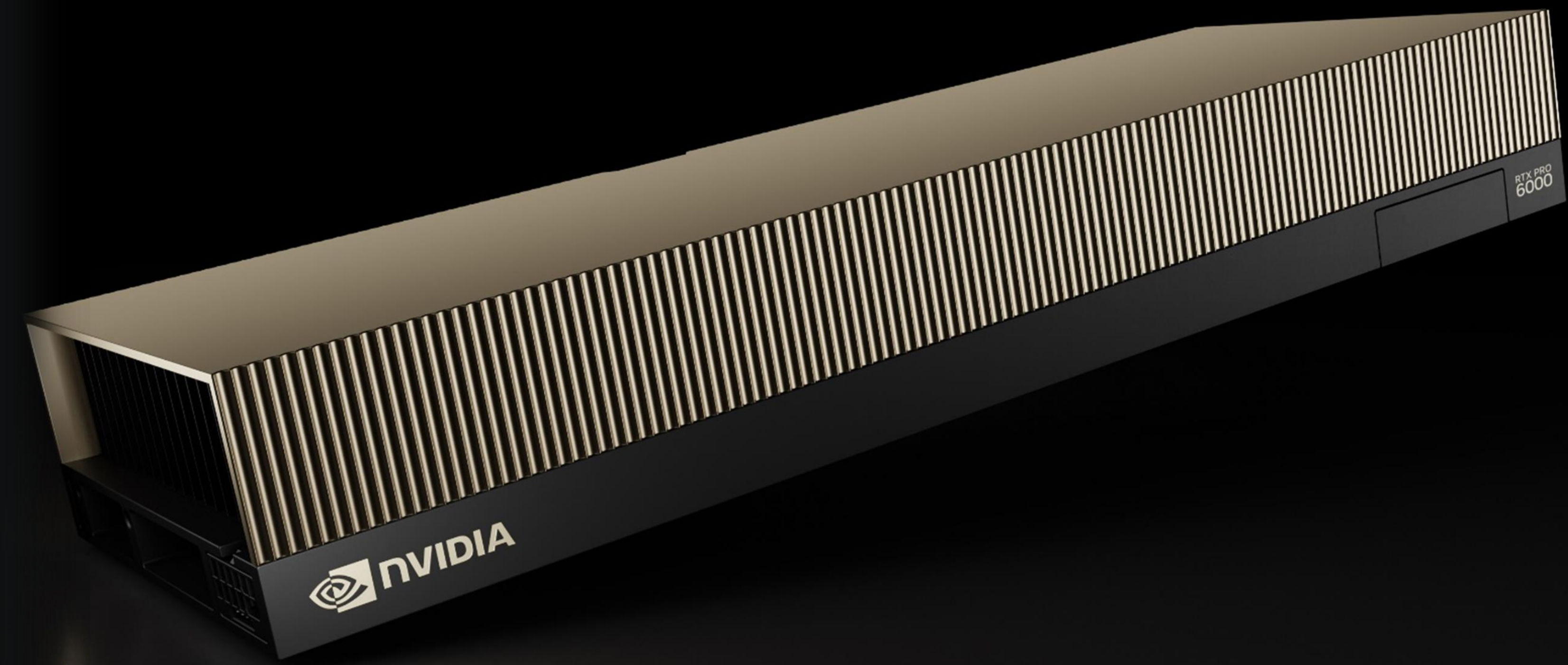
- 5th-Gen Tensor, 2nd-Gen Transformer Engine, FP4
- Full Media Pipeline: 4 NVENC/ NVDEC/ NVJPEG

Powerful Graphics and Visual Computing

- 4th-Gen RTX, Neural Shaders, DLSS 4
- vGPU Support, AI Virtual Workstations (vWS)

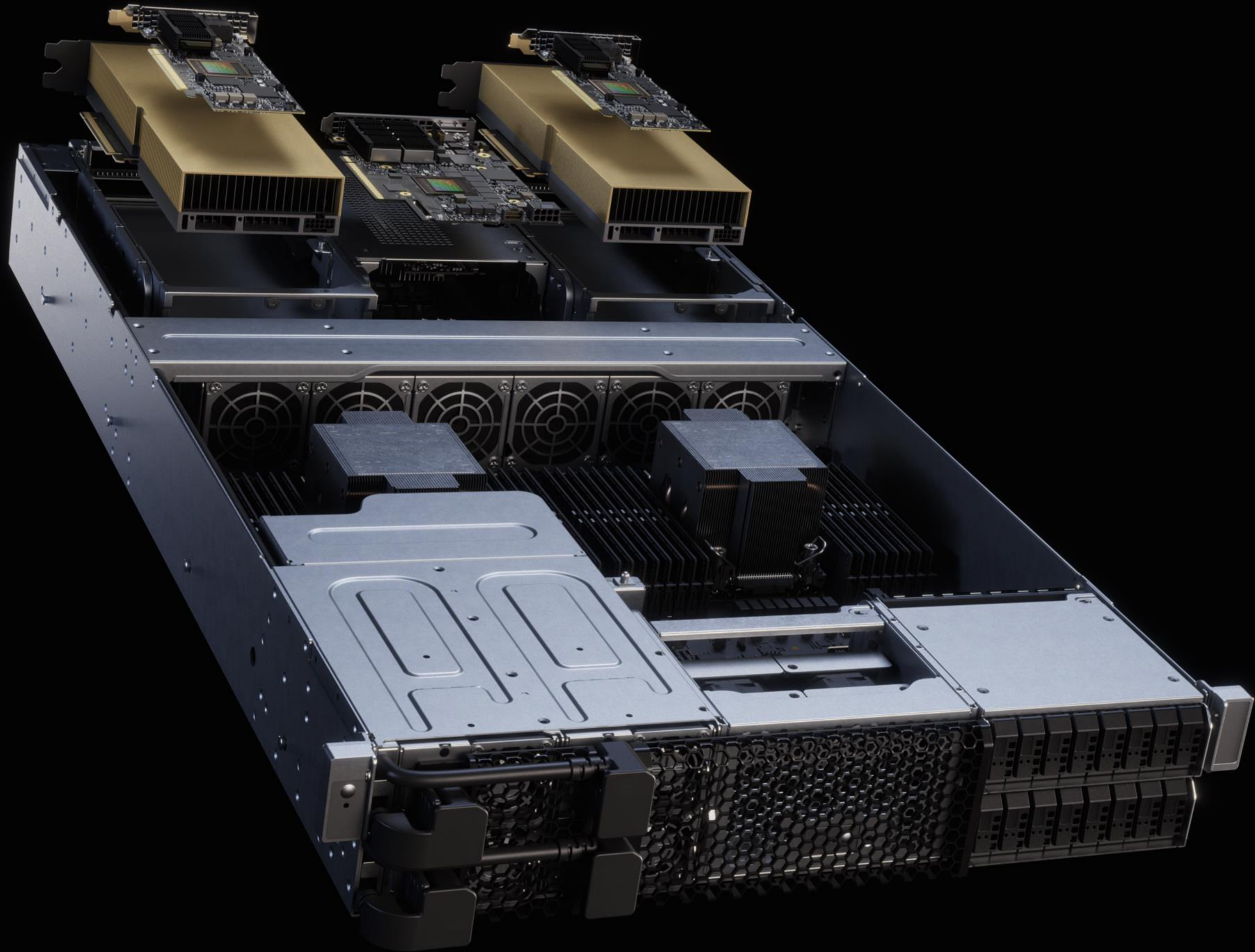
Data Center Ready

- 96GB GDDR7, 1.6 TB/s Memory BW, 128MB L2 Cache
- Multi-Instance GPU (MIG), TEE Confidential Compute



RTX PRO 6000 Blackwell Server Edition GPU

Dual Slot, FHFL I Up to 600W



RTX PRO Server

Example 2U System Configuration

RTX PRO Server	
GPUs	<ul style="list-style-type: none">• 2x NVIDIA RTX PRO 6000 Blackwell Server Edition
Networking (E/W) ¹	<ul style="list-style-type: none">• 2x ConnectX-7 (1x400Gb) or• 2x BlueField 3140H
Networking (N/S)	<ul style="list-style-type: none">• 1x BlueField-3 (B3220)
CPUs	<ul style="list-style-type: none">• 2x Intel® Xeon• 2x AMD EPYC
Memory	<ul style="list-style-type: none">• 512GB DDR5 ECC² (1 DIMM per channel)
Node Storage	<ul style="list-style-type: none">• 2x 4TB NVMe²• 1x 1TB NVMe boot drive

1. Consult with your OEM partner for specific networking (E/W) configurations
2. Recommended minimum.



RTX PRO Server

Example System Configuration

RTX PRO Server	
GPUs	<ul style="list-style-type: none">Up to 8x NVIDIA RTX PRO 6000 Blackwell Server Edition
Networking (E/W) ¹	<ul style="list-style-type: none">4x ConnectX-7 (1x400Gb) or4x BlueField 3140H or4x ConnectX-8 SuperNIC w PCIe Gen 6 Switch
Networking (N/S)	<ul style="list-style-type: none">1x BlueField-3 (B3220)
CPUs	<ul style="list-style-type: none">2x Intel® Xeon2x AMD EPYC
Memory	<ul style="list-style-type: none">1TB DDR5 ECC² (1 DIMM per channel)
Node Storage	<ul style="list-style-type: none">2x 4TB NVMe²1x 1TB NVMe boot drive

1. Consult with your OEM partner for specific networking (E/W) configurations
2. Recommended minimum.

건설 산업에서 Digital Twin이 가져다 줄 혜택

Fast, Accurate, Fewer Errors



- Faster than conventional surveying using transit theodolites, EDM lasers, GPS receivers, or total station theodolites
- Building geometry, construction topology, material quantities are all included in the 3D models
- Supervise and visualize projects remotely in a safe, hazard-free environment in real time
- Reduce rework and waste
- Minimize travel to save time and cost
- Improve safety by avoiding sending a crew to hazardous areas
- Map inaccessible features like cell phone towers and treetops
- No need to shut down public spaces during data capture

Benefits of Reality Capture in AECO

Delivers significant ROI

Project Planning
Site layout



Constructability Reviews
Problem identification



Scan-to-BIM
Import data into design software



Construction Monitoring
Progress tracking



Construction Verification
As-built v As-designed



Inspection Services
Reduced safety hazards



Virtual Tours
Remote visualization

Speed Up a Wide Range of Reality Capture Workflows

