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The Omniverse of Collaboration: Visualization using USD

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Learning Objectives

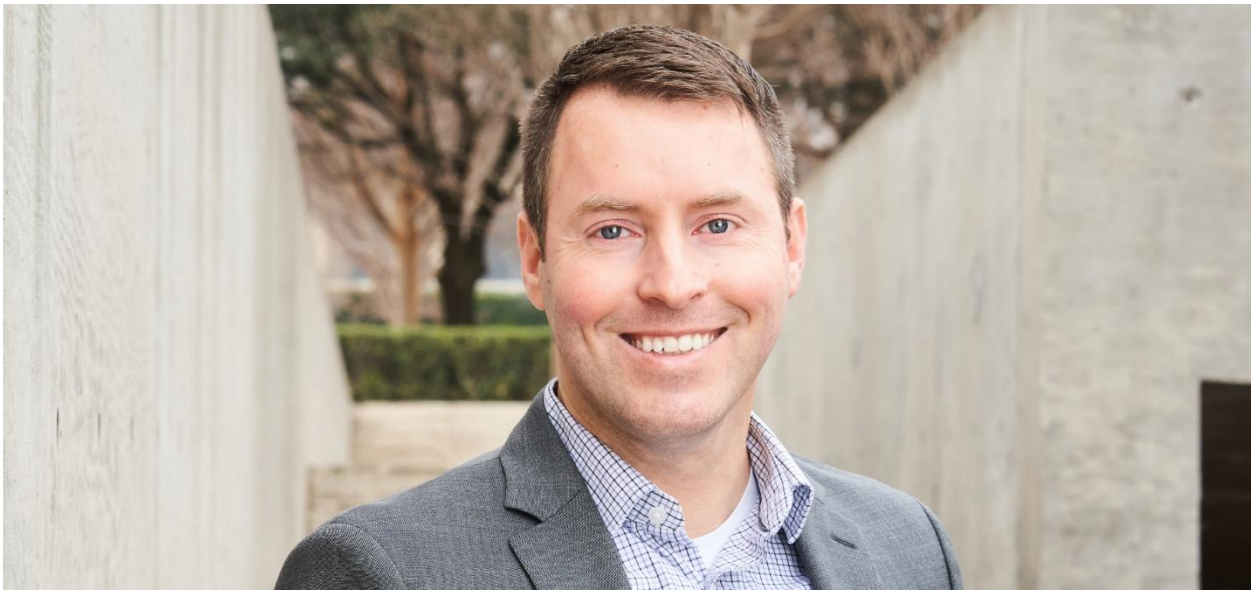
- Learn how to setup and configure Nvidia Omniverse Workstation
- Learn about selecting the right Omniverse App for the job
- Learn about USD and collaborative workflows
- Learn about the power of extensions and extendibility

Description

In industries like architecture, engineering, and construction (AEC) that use numerous design applications and visualization tools, the thought of trying to collaborate across applications, especially when it comes to visualization, can be daunting. NVIDIA Omniverse can help simplify collaboration and workflows. This technical instruction session will bring you up to date on the latest in (1) USD (Universal Scene Description) workflows using Connectors from Revit to NVIDIA Omniverse, (2) how to choose the right Omniverse app for your visualization needs, and (3) how to improve your experience and capabilities using Omniverse Extensions.

AUTODESK UNIVERSITY

Speaker



Eric Craft is a UX/Visualization professional, that is passionate about creating visualizations and immersive realities that enhance understanding of projects that move our communities forward. Over two decades of industry experience gives him an in-depth understanding of the needs of the AEC industry, and he takes pride in the strong relationships with immersive and visualization technology companies he has been able to cultivate.

Eric looks forward to seeing how we can transform the future for the better, using innovations within visualization technology as we move into the future.

About Mead & Hunt

Mead & Hunt provides clients with expert planning, architecture design, engineering, environmental and construction administration services across a wide variety of market sectors, including transportation (aviation, highways, roads and bridges), food and beverage processing, renewable energy, municipal infrastructure, military, telecommunications, cultural resources, and hydropower and water resources. In each of these disciplines, we've developed unique methodologies and processes to deliver cost-saving solutions that meet our clients' needs.

At Mead & Hunt, we approach each project as an opportunity for innovation – and we believe that innovation in any field begins with the same step: listening. That's why we build strong relationships with our clients, insist on cross-disciplinary collaboration and support continuing education. The result? Over a century of engineering and architectural solutions that have resulted in everything from cost-saving efficiencies to proprietary processes.

We take great pride in not only what we do, but how we do it. Serving markets nationwide for well over a century, we've demonstrated our technical, design and planning expertise. But what makes us different is that we don't measure our success in years or projects or revenue. Instead, it's measured in your satisfaction.

The employee-owned consulting firm remains strong on ENR's Top 500 Design Firm list with a national ranking of #91 in 2022.

The firm employs over 1,200 civil, structural, mechanical and electrical engineers, planners, historic preservationists, environmental scientists, architects, technicians and support specialists from 40+ offices located across the nation.

Existing Visualization Workflows

Mead & Hunt's interest in Omniverse comes out of the statement "create a collaborative environment with coworkers, industry partners, and clients". When I joined Mead & Hunt I did a review of the visualization workflows from early design to final client and marketing deliverables.

What I found was that the workflows appeared to be very siloed in nature. On the aviation side of things we have Civil3D from Autodesk, but there is no direct visualization workflow with data either going to Infraworks or 3ds max for visualization. Revit, Sketchup, Rhino, and Navisworks users could use Enscape3d, but none of the other tools can directly use it. Most of those packages also have exporters and workflows to work with Lumion and Twinmotion, but you have limits on workflows and outputs with those tools.

We also have many our clients requiring Bentley line of OpenRoads, OpenBridge, or other tools for their transportation projects. These transportation projects typically use the LumenRT engine, and while it supports other applications through plugins you run into similar limitations on workflow and output.

What really caught my attention with Omniverse was the true collaborative environment that it has, which I will talk more about later.

Learn how to setup and configure Nvidia Omniverse Workstation

Setup and Configuration

Application Setup

- Currently Omniverse is installed per user, so I recommend installing to the default user locations.
- Beware that the Content folder targets the User Download folder, I recommend moving that to a similar location of the other folders.

Nucleus Server

- For Administrator account admin/admin and omniverse/omniverse are reserved user/password so use something else to create the account.
- You can edit the default accounts by changing them in the user accounts, if needed.
- Be sure to setup the Nucleus Server for Collaboration by Enabling Sharing from the Settings page.

Additional Tools

- PathCopyCopy is recommended to copy paths in UNIX format as that is what is expected by Omniverse.

Setup and Managing Apps and Connectors

- UsdView 0.22.8 (the latest version at the time of writing) will not work if installed from Omniverse to a directory path containing spaces.
- If it will not launch and the path contains spaces move the folder and then run: [path_to_install]\usdview-0.22.8\scripts\usdview_gui.bat

Learn about USD and collaborative workflows

USD and Omniverse

- Pixar provides great documentation on the USD format and the API.
- NVIDIA also provides some good documentation for Working with USD Python Libraries and USD Python API Notes.

UsdView and Animal Logic ALab Sample

- UsdView is available for install from the Omniverse Launcher.
- The Animal Logic ALab Sample scene can be downloaded from the website.
- Animal Logic has also provided a great README for the File.

Connector Workflows

- When using Send to View or Publish Project the file that is linked is: /ProjectFiles/[ProjectName]/[ProjectName].[Application].usd
- ***DO NOT*** link to the file: /[ProjectName]_[Date]_[Time]/[ProjectName]_[Date]_[Time].project.usd

Learn about the power of extensions and extendibility

Extensions and Extendibility

- The Extension samples and Action files are included in the Additional Files downloads.
- To find the latest releases of my tools, submit feature requests, contribute, or posts issues please do so on my GitHub pages for the tools.
    - https://github.com/ericcraft-mh/meadhunt-enscape-loader
    - https://github.com/ericcraft-mh/meadhunt-mesh-backplate
    - https://github.com/ericcraft-mh/meadhunt-utility-materials-deleteunused

Resources

- Additional Omniverse and USD resources can be found on my GitHub page.