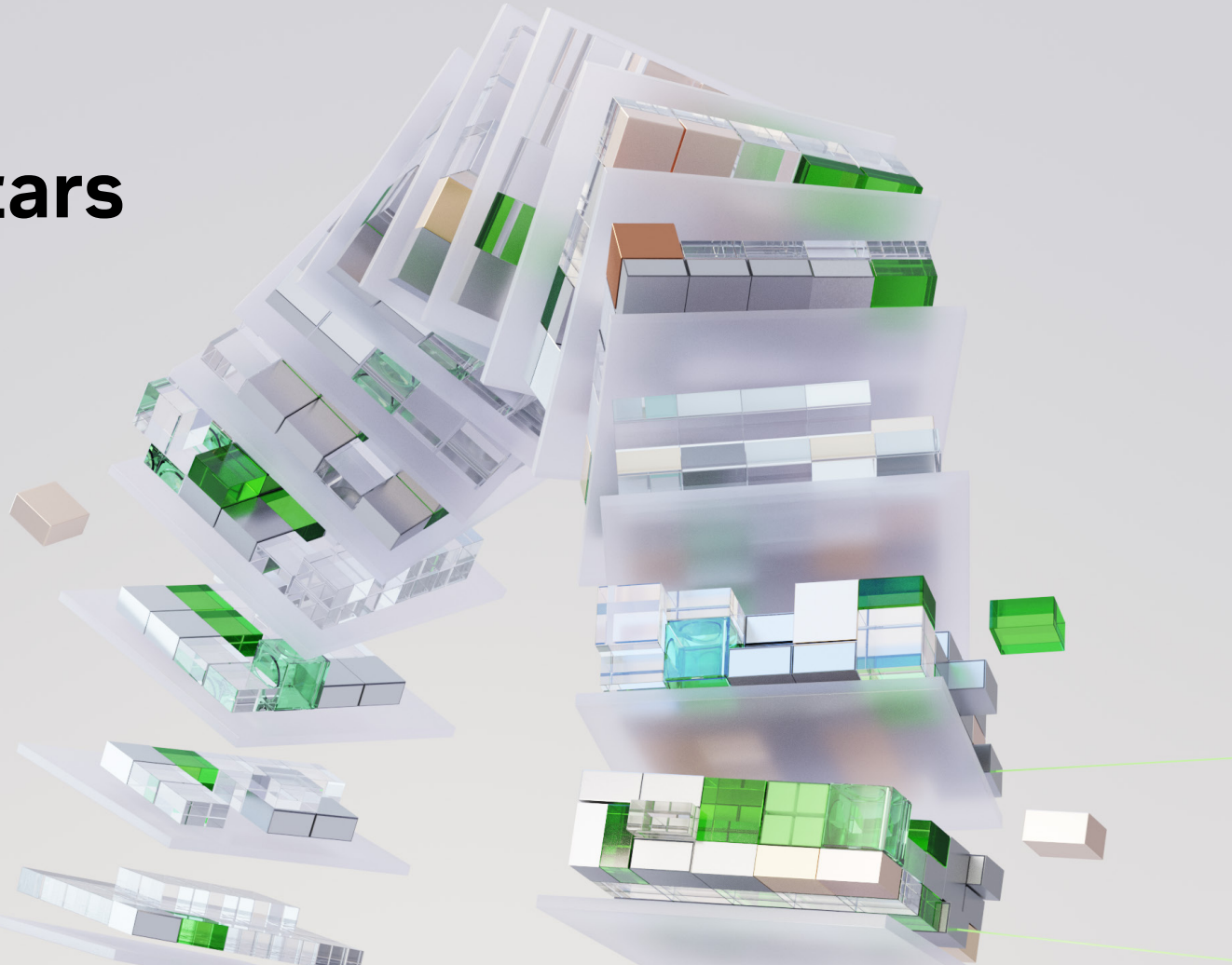
NVIDIA | OpenUSD

OpenUSD All-Stars

Second Edition



Unlocking Interoperability With OpenUSD

Universal Scene Description, also known as OpenUSD, is an open and extensible ecosystem for describing, composing, simulating, and collaborating within 3D worlds.

OpenUSD delivers essential features and capabilities that enable teams to enhance workflows and accelerate projects. Whether you're creating assets for expansive, AI-driven virtual worlds or developing the tools to bring these environments to life, OpenUSD provides a robust framework that boosts collaboration, increases efficiency, and streamlines the integration of complex data into cohesive, interactive 3D models.

NVIDIA is working closely with partners and the open-source community to accelerate and expand OpenUSD adoption across industries. Together with Pixar, Adobe, Apple, and Autodesk, NVIDIA formed the **Alliance for OpenUSD (AOUSD)**, which is dedicated to fostering the standardization, development, evolution, and growth of OpenUSD.

Synthetic Data Generation

Product Digital Twins

Virtual Facility Integration

Robotics Simulation

Sensor Simulation

Emily Boehmer

OpenUSD for Synthetic Data Generation

> “My experience using OpenUSD for asset creation and scene building, paired with my studies in psychology, set me up well to explore life-changing applications.”

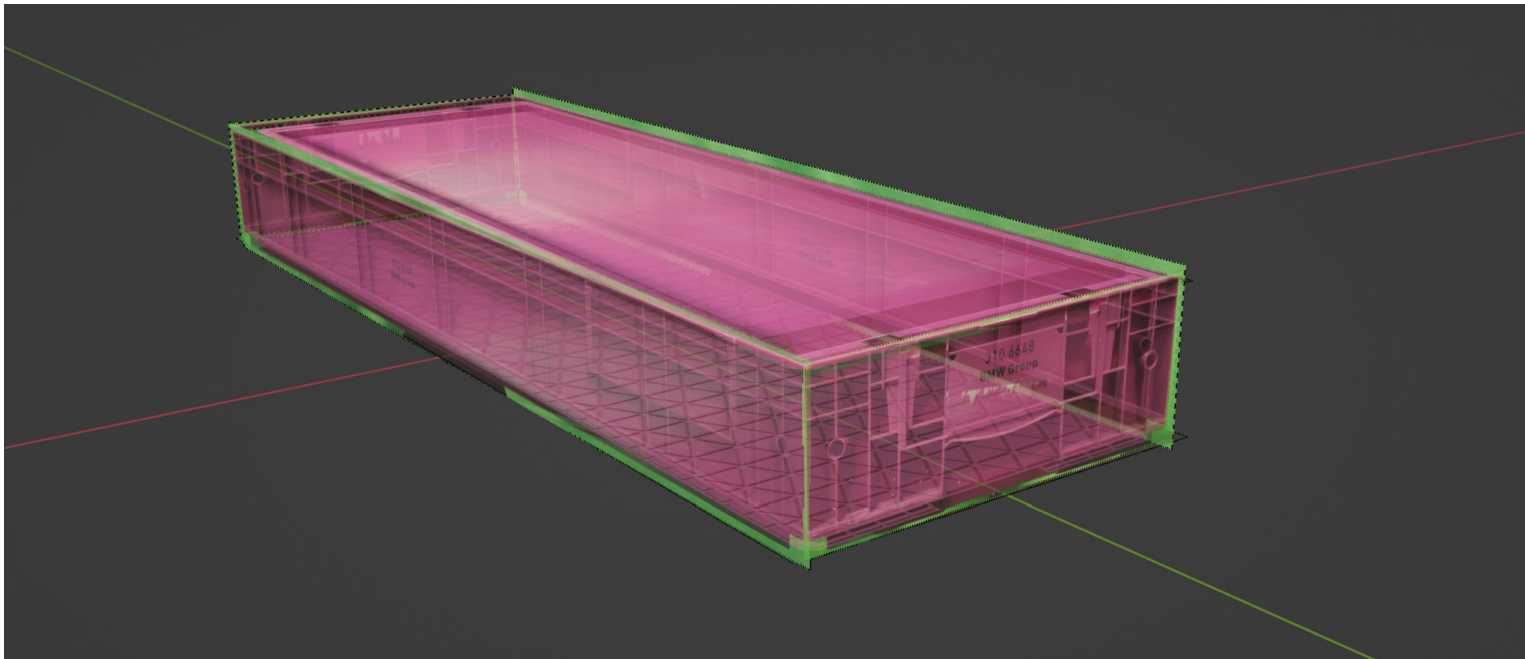
As a design intern at BMW Group’s Technology Office in Munich, Emily Boehmer created photorealistic 3D assets for AI training, which were crucial for **generating synthetic data** to efficiently train AI models. This was when she was first introduced to OpenUSD, and how it allowed her to create various scenes using the same components.

The flexibility of OpenUSD made it easy for her to change 3D models while keeping them consistent across all the different scenes. Additionally, the assets she created were used to test and simulate autonomous robots on the **NVIDIA Isaac Sim™** platform, which offers capabilities for generating synthetic, photorealistic, and physically accurate virtual environments.

Emily’s internship experience has uniquely prepared her for her pursuit in psychology. Her deep interest in becoming a psychologist is driven by a desire to help others improve their wellbeing and relationships.

Pulling from her experience using OpenUSD to create assets and build scenes, Emily now explores the intersection of virtual environments and therapy. She’s currently looking into the possibilities of creating safe, virtual spaces for therapy, where she hopes to expand and apply more of her design skills.

Learn more about **Emily’s work**.



Rachel Mendoza

OpenUSD for Product Digital Twins

> "OpenUSD is more than a file format—it is a way of working … but it's a change that creates huge efficiencies and huge scope for producing new content at scale."

WPP and Ford

Rachel Mendoza's work focuses on the operationalization and productization of digital assets. This involves a significant shift in traditional workflows to embrace the innovative capabilities of OpenUSD. By integrating OpenUSD into their workflows, Rachel and her team at **WPP**, one of the world's largest advertising agencies, can unlock new ways to enhance efficiency and scalability in producing content at a massive scale.

Rachel pioneers the use of OpenUSD to standardize and convert diverse data sets from various stages of design into a unified format within the **NVIDIA Omniverse™** environment. This integration facilitates the creation of digital twins and the continuous updating of product models, ensuring that they reflect real-time changes as they edge closer to production.

Her efforts are critical in enabling seamless transitions from legacy tooling to more advanced, efficient systems that support the dynamic needs of today's digital production landscapes. Rachel's work exemplifies the cutting-edge collaboration between WPP and NVIDIA, driving forward the possibilities of generative AI and further innovation in creating immersive, realistic 3D environments and backgrounds.

Learn more about **Rachel's work**.

Vasyl Mykhalchuk

OpenUSD for Virtual Facility Integration

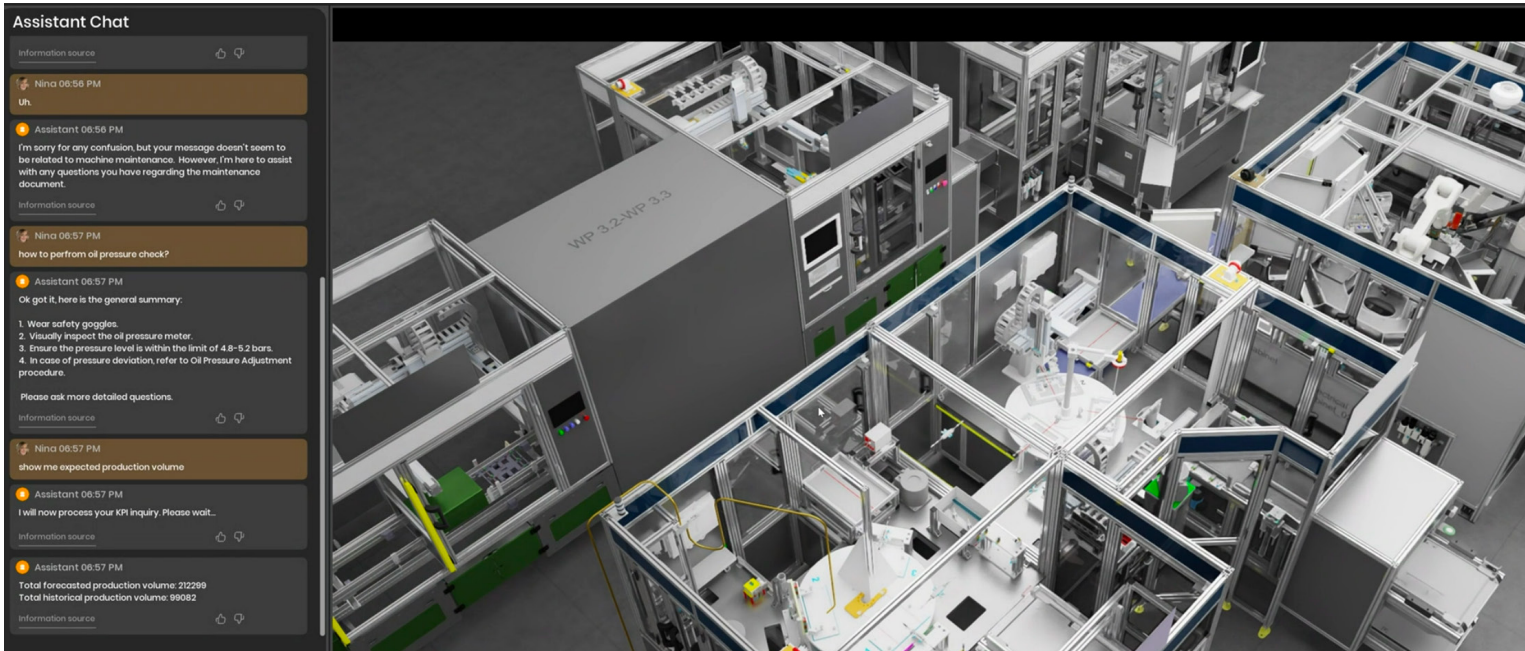
> “OpenUSD is at the heart of every project and an integral part of our workflow, especially for non-destructive editing and composition features.”

At SoftServe, Vasyl specializes in building tools for high-fidelity visualization, procedural generation, and simulation. He has been using OpenUSD for years, after recognizing its seamless integration with Omniverse’s capabilities, which enabled more efficient and streamlined workflows. Now, OpenUSD plays an essential role in his projects, and he particularly appreciates its non-destructive editing capabilities.

Additionally, as an open format and a framework with APIs to manipulate and build scenes, OpenUSD offers immense capabilities in generative AI, including generative scene compositions and industrial copilots. One of Vasyl’s favorite features is that, as an engineer, he can easily apply generative approaches to build scenes from code, enabling possibilities for generative AI in 3D, all within an open standard file format.

Vasyl is now focused on expanding the use of OpenUSD to develop industrial copilots and large-scale **digital twins**. His goal is to create cohesive and interconnected virtual environments that enhance productivity and collaboration across various industries. Ultimately, Vasyl and his team see OpenUSD as a pivotal technology in driving the future of digitalization and the industrial metaverse.

Learn more about **Vasyl’s work**.



Mathew Schwartz

OpenUSD for Virtual Facility Integration

> "With OpenUSD and Omniverse, we've been able to expand the scope of our research, as we can easily combine data analysis and visualization with the design process."

Mathew Schwartz is enhancing accessibility in design through innovative technology. Using the Omniverse platform and OpenUSD framework, Schwartz leads his research lab, SiBORG, in developing algorithms that improve design workflows, focusing particularly on accessibility.

Mathew's team has created an open-source code that generates a detailed accessibility graph for building designs, which helps in evaluating human movement and safety considerations. This tool allows designers to visualize and optimize paths within buildings, ensuring they meet accessibility standards and enhance occupant safety.

Previously, Mathew had to juggle multiple applications for simulations and 3D modeling. Now, with OpenUSD, Schwartz can unify his research, Python code, 3D environments, renders, and preferred tools in one place. This integration enables his team to use Omniverse for visualizing and interacting with their existing Python code without the need for external applications, facilitating interactions with any program compatible with OpenUSD.

Learn more about **Mathew's work**.

Dr. Zichao Zhou

OpenUSD for Virtual Facility Integration

> “OpenUSD is central in our workflow, especially for integrating digital assets and supporting old assets. With OpenUSD, we can enhance collaboration and data compatibility across software and designers.”

Dr. Zichao Zhou and her team specialize in providing a smart design SaaS platform for interior designers. Recently, they developed an AI-based design and simulation function on the platform for smart home designers, which recreates the entire user workflow and consumer experience.

Designers can create various simulation scenarios by using the smart home design function, such as changing lighting in home mode, movie mode, and sleep mode. Then, they can show it to consumers through **XR devices** or panoramic images. OpenUSD plays a pivotal role in simplifying Zichao’s design pipelines, especially in integrating various digital assets and ensuring compatibility across different software used by designers.

Since integrating OpenUSD into her workflows, Zichao and her team have experienced many benefits, including significant time efficiency with faster project completions, reduced manual effort through automation, and increased productivity, allowing for multiple projects to be handled simultaneously.

Her favorite feature of OpenUSD is its ability to unify various digital assets and formats, which eliminates data barriers. This not only facilitates time and cost savings for home furnishing enterprises, but also enhances consumer satisfaction by providing quicker feedback from home designers.

Learn more about **Zichao’s work**.

Resources to Get Started

1. Try

- **Download Omniverse SDK** to start your 3D development journey today.
- Access **developer resources** to start building on Omniverse, including free tutorials, documentation, and beginners' training for getting started with OpenUSD.

2. Learn

- For more on how OpenUSD can improve 3D workflows, check out this OpenUSD learning series on **YouTube**, featuring Aaron Luk, a founding developer of Pixar USD.
- Explore **NVIDIA's contributions to OpenUSD** and check out these **OpenUSD resources**.
- Don't miss **Omniverse Insiders livestream series** on YouTube sharing various OpenUSD workflows.
- Get inspired with our **Into the Omniverse** series, which explores how technical artists, developers, and enterprises can revolutionize their workflows with OpenUSD.

3. Connect

- Become a part of the **Omniverse community**.
- Connect with fellow "Omnivores" on **Discord** and **forums**.
- Follow NVIDIA Omniverse on **Instagram**, **LinkedIn**, **X**, and **YouTube**.

Featured Partners

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