



Customer Case Study

Zaha Hadid Architects builds innovation with HP Z Workstations & Solutions.

Reimagining creativity in architecture and design for a new era of AI.

Zaha Hadid Architects

Industry

Architecture, Engineering and Construction

Country

United Kingdom

Objectives

- Develop world-class virtual environments for sharing project prototypes
- Enable flexible, creative exploration workflows for architects and designers
- Increase velocity of research breakthroughs and iterations for project planning
- Integrate locally trained AI models into architect workflows

Approach/Solutions

- Create state-of-the-art technology platforms utilizing HP Z workstations and solutions supported by NVIDIA
- Key solutions include HP AI Studio¹ and HP Z Boost,² powered by HP Z4 Rack and HP Z8 desktop workstations
- Propel the Zaha Hadid Architects (ZHA) signature design heritage into an AI-driven stage of innovation
- Boost collaboration and innovation capabilities with increased compute and custom AI-driven solutions

Business Outcomes

- Boosted pace of early-stage iterations in client projects by 10x, using HP AI Studio capabilities
- Accelerated computation time shortens consultant and client feedback loops considerably—reviews which previously took a week can be done in a day or almost real time now³
- Equipped ZHA design teams with advanced compute resources, enabling breakthrough process innovations
- Simplified the technology partnership model for efficiency and tightly focused innovation





Carrying a visionary legacy into the future with HP Z Workstations & Solutions.

Occasionally, a trailblazer arises who possesses a unique creative vision, enabling them to transcend accepted practices and expectations in their industry. The visionary architect and designer Zaha Hadid (1950–2016) is just such an icon.

The first woman to be awarded the prestigious Pritzker Architecture Prize in 2004, the late Zaha Hadid was a pioneer in innovative materials and the realm of parametric design, harnessing the power of algorithms to craft her astonishingly complex forms. Her work is defined by uniquely fluid, flowing designs that defy traditional architectural boundaries to create dynamic, sculptural contours that often evoke the natural world.

Today, Zaha Hadid Architects (ZHA), headquartered in London, continues to expand on her pioneering vision, redefining architecture and creating a dizzying variety of awe-inspiring structures across the globe.

To generate and iterate at the highest levels of creativity demands constantly evolving, bespoke tools. Since kicking off a collaborative partnership with HP (along with NVIDIA) in 2021, ZHA teams have opened ever more expansive possibilities for creativity. One of the ongoing goals for ZHA is continuous innovation in the creative process. The firm's technology and research teams have chased this aspiration by finding ways to supercharge the pace of design inspiration stages, while decreasing the amount of time needed to generate and assess radical new design ideas.

HP Z technology powers the ZHA team throughout their workflow/design process. "With the power of HP technology and solutions we can really explore our design space to create multiple design iterations. More importantly, the technology enables us to evaluate each of these design options and quickly choose the best one to take forward," explains Vishu Bhooshan, Senior Associate, Computation and Design Group (ZHA CODE). "That is really the most powerful thing technology could deliver."



950

ZHA projects
in 44 countries

480

ZHA architects
on staff globally

50 person

internal team conceptualizing
and developing technologies

"We've been able to accelerate computation time considerably with HP technologies, which in turn has enabled more frequent consultant and client feedback loops. Things which took one week to be coordinated previously can be done in a day or almost real time now."³

**Vishu Bhooshan, Senior Associate, Computation & Design Group
Zaha Hadid Architects**

This combination of HP AI solutions and NVIDIA technology enables inspiration at ZHA to flow freely. "We're never satisfied with repeating ourselves, and we like to challenge the status quo," says Nils-Peter Fischer, director at ZHA. "We run a lot of experiments, we like a lot of data, and we run well-informed models. HP is helping us overcome some of the limitations and challenges we face, making adaptive tasks much quicker and easier."



400

HP Z4 Rack workstations

Diverse working methods flow together in a unified workspace.

ZHA is currently running close to 400 HP Z4 Rack workstations, so architects have their own machines in the data center and AI inferencing can be done locally. This was the first step to enable designers to move away from working on an individual unit at their desks and instead become integrated into a collective environment at scale.

“HP was one of the only technology partners who understood both remote compute and collaboration, and who had a lineup of graphics workstations available in a rack-mounted format,” says Fischer. “The relationship between HP and NVIDIA was really helpful. The hardware estate accessible to us was a big enabler.”

“HP is helping us overcome some of the limitations and challenges we face, making adaptive tasks much quicker and easier.”

Nils-Peter Fischer, Director
Zaha Hadid Architects

The ZHA team uses HP AI Studio to build their own custom AI models and accelerate AI development.³ With HP AI Studio the team can tap into pre-built container images and production-ready blueprints, and have the ability to share and collaborate on projects with less reliance on cloud resources.³ The technology is powered by HP Z8 desktop workstations with NVIDIA RTX™ 6000 cards, and ZHA’s teams are taking full advantage of the GPU-based power. “With HP Z8 workstations, we can more quickly train and fine-tune the models,” he says. “And this will be even more accelerated when we upgrade to NVIDIA Blackwell cards.”





A key goal for the ZHA technology teams is to embed the tools they use for research and exploration into the design workflows—and HP and NVIDIA make a seamless solution possible. For designers, this means blending tools without having to leave the comfort and speed of familiar processes. Utilizing NVIDIA Omniverse, the ZHA team has developed ZHA Create, enabling access in one interface to AI and computational tools for geometry processing, robotic and digital manufacturing feedback, floor plate analysis, environmental analysis, AI rendering, etc.

“We can use it kind of as a hub that connects 3D software like Rhino and Maya,” notes Christoph Geiger, researcher at ZHA. “Image data is sent to a back end, where it’s processed with generative AI, then ported directly back into the software. Designers don’t have to ever see the more complex user interfaces.”

One of the biggest challenges in AI is the large quantity of computing resources needed to run big models. HP Z Boost offers ZHA an easily accessible path to overcoming the challenge of ever-increasing computation needs, delivering additional power by accessing idle GPUs in shared workstations.⁴ Fischer notes, “With HP Z Boost, we see the potential to efficiently convert part of our workstation estate into large compute clusters and run big models with the hardware that we already possess.”

ZHA is also using HP Z Captis, the world’s first digital material capture system integrated with Adobe Substance 3D.³ “We dedicate enormous effort to considering materials and textures in designing interiors,” says Helmut Kinzler, associate director at ZHA. “With Captis, we can scan samples from manufacturers and transplant them into digital simulations to show clients and stakeholders what their furniture, materials, and interiors will look like. This is a huge benefit. Shipping physical material samples across continents is time-consuming.”

Experiencing the designs in this immersive way can help ZHA transcend geographical, cultural, and language barriers among their diverse, international clientele.

“We’re now able to bridge the gap between the abstract models architects use, and what clients require, which is clearly rendered images showcasing spatial use cases,” Bhooshan says. “We’ve been able to accelerate computation time considerably with HP technologies, which in turn has enabled more frequent consultant and client feedback loops. Things which took one week to be coordinated previously can be done in a day or almost real time now.”³

“All this clearly adds complexity,” notes Kinzler. “The technological partnerships with HP and NVIDIA are absolutely fundamental.”



Accelerating imagination and execution for its clients.

“More testing rounds and quicker responses from the models mean ZHA can make its limited iterations more focused and meaningful,” says Fischer. “As architects, we have a small amount of time to make a very strong promise to a client. I do believe there’s a correlation between the quality and the speed of the tools you have and the quality of the output.”

ZHA relies on models, created in HP AI Studio, for quick prototyping and testing in the visual space, including 3D generation.³ “In early design stages we have already seen a stunning increase in how fast we can iterate,” says Geiger.³

Solution at a glance

- HP Z4 Rack Desktop Workstations
- HP Z8 Desktop Workstations
- HP AI Studio
- HP Z Boost
- HP Z Captis
- HP Monitors

“HP and NVIDIA allow Zaha Hadid Architects to innovate in the integration of these frontier technologies.”

**Christoph Geiger, Researcher, Computation & Design
Zaha Hadid Architects**

HP demonstrated a keen, expansive understanding of ZHA working processes. “Requirements we have are similar to the entertainment industry,” explains Fischer. “The software we use to create designs isn’t classical architectural engineering software, it’s essentially like virtual reality software.”

The VR-like environments brought to life by high-performance HP Z workstations have transformed the design process and the relationship between ZHA and its clients. “We’re using video-gaming engines where we have 360-degree visualization inside a prototype,” says Kinzler. “We offer our clients their own experiential engagement with the spaces. We want to have multi-presence, to see it together with our stakeholders that visit the space, and we want to communicate inside the simulation.”

“HP has been the one-stop solution that we needed to achieve this level of functionality,” continues Kinzler. “There’s an ongoing process that’s magic when you have the right partners and the right tool kit. We’re influencing the tools, where we’re in dialog with the right toolmakers. It’s been a blessing to work with HP and NVIDIA on that.”

“The future of AI in our domain relies heavily on having access to tools which can then be combined in different ways,” says Geiger. “HP and NVIDIA allow Zaha Hadid Architects to innovate in the integration of these frontier technologies.”

Learn more at: [HP.com/Z](https://hp.com/Z)

1. HP AI Studio requires Windows 10 (build 19041 and higher) or Windows 11 OS, Intel Core™ i5 12th gen or higher, AMD Ryzen™ 9 or higher processors, minimum 50 GB of available storage, 16GB of RAM, and Internet access. To enable GPU compute, HP AI Studio requires any NVIDIA® GPU compatible with driver version 528.89 or newer. A minimum of 8GB of VRAM is recommended.

2. HP Z Boost requires client device with Windows 10 or Windows 11 OS and Vulkan Runtime for devices without a GPU, or WSL2 with Ubuntu 22.04 or Ubuntu 22.04 LTS or greater. Host device for sharing GPU(s) must be a HP Z workstation with NVIDIA professional grade workstation GPU(s) of Pascal architecture or later with an installed driver version 535 or greater, and a CUDA driver version 11.2 through to 12.3, Windows 10 or Windows 11 OS (WSL is not supported), or Ubuntu 22.04 LTS or greater or Debian 11 or greater with libatomic1, libnuma1, libvulkan1, libgl1, libglu1, libglib2.0-0 packages installed. Network connection required.

3. Based on Zaha Hadid Architects internal analysis of HP AI Studio and HP Z Boost.

4. Based on HP’s internal analysis of digital material capture systems with a minimum 1 digital camera, programmable photometric lighting, and integrates with Adobe Substance 3D Sampler. Adobe Substance 3D license sold separately.

