DR ADI PANDŽIĆ UNLOCKS SOLIDWORKS® COMPLEXITY AT SCALE

CASE STUDY

Mechanical engineer Dr Adi Pandžić uses HP Z workstations with AMD Ryzen™ and AMD Radeon™ PRO processors to design colossal SOLIDWORKS CAD assemblies

The Bosniak is a beast of a design study for a 6x6 off-road pick-up truck. Designed in SOLIDWORKS® by Dr Adi Pandžić, it's an impressive example of CAD without compromise in action. When showcased carrying a sports motorcycle – one of the main purposes for which it was designed – the combined model weighs in at over 6,500 individual parts, making it an excellent real-world stress-test subject for workstation hardware.

This type of complexity is a hallmark of Pandžić's work. In December 2025, he was selected as one of three winners of the SOLIDWORKS 30th Anniversary Competition, with his design for the futuristic Black AI Tractor, which features over 7,000 individual parts with an engineering level of detail.

His work covers many bases. A Ph.D mechanical engineer and educator, Dr Pandžić is a material testing coordinator and assistant professor at the Faculty of Mechanical Engineering University of Sarajevo in Bosnia. In parallel with his research and teaching activities, he also runs his own commercial consultancy business, specialising in CAD and 3D printing strategies for complex mechanical systems in industrial design.

On GrabCAD, meanwhile, he's known as 'DrPax' and ranks among the Top 30 most-followed members of this online community of 16 million product designers, engineers and 3D printing specialists. Passionate about open-source engineering and knowledge sharing, he regularly uses the site to share highly detailed CAD models, renders and other educational and training content.

> **"I never have to worry that a model is too big or too complex, because I know the hardware can handle it. I'm multi-tasking and everything is open, and I still don't have any problems."**
>
> Dr Adi Pandžić

HIGH-PERFORMANCE FOR EXTREME CAD

This combination of complexity and ambition means that robust, high-performance hardware is a must-have for Pandžić. Both the Bosniak and the Black AI Tractor were developed using the latest HP Z workstations powered by AMD Ryzen™ AI PRO processors and AMD Radeon™ PRO graphics. But it was the Bosniak, he reckons, that best represents his most challenging project ever, with the model taking between four and five months to design and build.

INDUSTRY

Design and manufacturing

CHALLENGES

Working with extremely complex SOLIDWORKS CAD assemblies across modeling, rendering, and multi-tasking workflows – without limiting creativity

SOLUTION

Deploy HP ZBook Ultra G1a and HP Z6 G5 A workstations, powered by AMD Ryzen™ processors and AMD Radeon™ PRO GPUs, eliminating GPU memory bottlenecks in SOLIDWORKS design workflows

RESULTS

Design freely in SOLIDWORKS and render in SOLIDWORKS Visualize without worrying about hardware limits, or performance slowdowns

AMD TECHNOLOGY AT A GLANCE

AMD Ryzen™ AI Max+ PRO processor, AMD Ryzen Threadripper PRO processor, AMD Radeon PRO GPU

TECHNOLOGY PARTNERS

*A Dassault Systèmes brand

Ph.D mechanical engineer and educator, Dr Pandžić in his lab at the Faculty of Mechanical Engineering University of Sarajevo in Bosnia

"Without good hardware, that would have been very difficult," he says. "My working style involves a lot of designing directly in assembly, so I often need to open a full model to work on some part inside that model. With the hardware set-up that I have, I don't need to worry about performance lags or crashes. I don't even think about them."

LAPTOP PERFORMANCE WITHOUT COMPROMISE

What is particularly impressive is that, in much of his work, this peace of mind is amply delivered by an ultra-portable 14-inch laptop, the HP ZBook Ultra G1a. Equipped with an AMD Ryzen™ AI Max+ PRO Processor with integrated AMD Radeon™ PRO GPU, this machine challenges the somewhat outdated perception of 14-inch laptops as 'entry-level' – especially those with integrated graphics. The laptop has 128 GB of system memory, but up to 96 GB of that total can be allocated to the powerful integrated AMD Radeon GPU.

> **"The HP ZBook Ultra G1a is really easy to carry around, so I can work from wherever I want. I really don't feel any difference in performance terms between this and the [desktop] workstation. "**
>
> Dr Adi Pandžić

Pandžić's desktop workstation, meanwhile, is an HP Z6 G5 A with an AMD Ryzen™ Threadripper™ PRO processor and AMD Radeon PRO W7900 GPU with 48 GB of GPU memory.

"But this little beast is what I use the most," he says, indicating the HP ZBook Ultra G1a. "It's really easy to carry around, so I can work from wherever I want. It's been my main machine for most of 2025 and all of 2026. I really don't feel any difference in performance terms between this and the [desktop] workstation."

With access to this hardware, Pandžić can work freely and without problems on very complex datasets and multi-application workflows. "I've never hit a limit yet. I never have to worry that a model is too big or too complex, because I know the hardware can handle it," he says. "I'm multi-tasking and everything is open, and I still don't have any problems."

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That freedom extends to the production of final high-resolution images and videos, for which he uses SOLIDWORKS Visualize. When modelling and rendering the prize-winning Black AI Tractor, for example, GPU memory utilisation hit around 30 GB, he says – comfortably within the 96 GB available on the HP ZBook Ultra G1a.

That headroom is significant. Most mobile workstations with discrete GPUs top out at 16 GB or 24 GB, and hitting those limits can severely impact performance.

He's also able to run two monitors off the laptop, one displaying at 4K and another at 5K, as well as using its own built-in screen. Even with multiple 3D applications there's no performance lag.

So confident is Pandžić in his hardware set-up that he's considered experimenting with a model that showcases not just the pick-up truck and the sports motorcycle, but also the tractor – probably around 15,000 individual parts in total. "I think the hardware can handle it," he says.

The Bosniak, a 6x6 off-road pick-up truck designed in SOLIDWORKS® and rendered in SOLIDWORKS Visualize

> **"I've probably got the best hardware in Bosnia, so I know I'm a lucky guy!"**
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> Dr Adi Pandžić

FROM DIGITAL MODELS TO REAL-WORLD IMPACT

Pandžić is also focused on bringing his designs into the physical world, combining modelling and visualisation in SOLIDWORKS on HP / AMD hardware with 3D printing to manufacture medical devices aimed at addressing real-world health challenges. "The opportunity to address and solve real problems for real people is very interesting to me," he says. Regardless of his next challenge, Pandžić feels fortunate that his imagination isn't constrained by hardware issues. "It makes me feel bad for those engineers who must limit themselves because of hardware. I know from past experience that those issues can limit your creativity," he says. "I've probably got the best hardware in Bosnia, so I know I'm a lucky guy!"

When carrying a motorcycle the model weighs in at over 6,500 parts, making it an excellent stress-test subject for workstation hardware

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ABOUT Dr Adi Pandžić

Dr Adi Pandžić is a mechanical engineer, educator, CAD and 3D printing specialist known for pushing the limits of complex digital design. A PhD holder and assistant professor at the Faculty of Mechanical Engineering, University of Sarajevo, Bosnia, he also works as a material testing coordinator and runs a consultancy focused on CAD and 3D printing for industrial applications. Under his online alias "DrPax" on GrabCAD, he is among the platform's most-followed creators, sharing highly detailed models and educational content.
For more information visit www.drpax.ba/en

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