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Developing tomorrow's AI on today's AI-ready workstations

Dell Technologies developers use powerful Dell Precision workstations and software to expand AI's capabilities, such as with AI-based Dell Optimizer software.

Story summary

Dell Technologies has long used AI to enhance hardware performance. Now, Dell Precision workstations — such as the purpose-built Data Science Workstation model — are top AI-development platforms with ready-to-use technology stacks. They also come with Dell Optimizer software that enhances and customizes each user's experience.

Innovations

Accelerates time to value with preconfigured, AI-ready workstations for development and edge applications.

Simplifies the development and deployment of a wide variety of AI applications, including Generative AI.

Outcomes

Enables AI development locally for flexibility and cost savings.

Simplifies AI development with ready-to-use technology stacks.

Personalizes the user experience to boost productivity.

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> Technology Strategist, Dell Technologies

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Years before Generative AI (GenAI) captured worldwide headlines, Dell Technologies employed other types of AI algorithms and machine learning in its firmware to optimize the performance of the Dell hardware portfolio — workstations, servers, networking and storage.

Technology Strategist Farzad Khosrowpour points to the emergence and growth of data-intensive workloads as driving the use of AI across Dell product lines. "For a long time, we have envisioned broader end-to-end applications of AI, from client and edge devices to servers and storage to public and hybrid clouds," he says. "AI-enabled solutions combined with software-defined infrastructures can work magic on a wide range of customer pain points and problems."

Pioneering data science workstations

Dell Technologies also broke new ground in 1997 with its Dell Precision workstations for compute-intensive applications, such as 3D computer-aided design and engineering, scientific simulations and complex video graphics. "Today's Precision models put into mobile, tower or rack form factors the equivalent supercomputing parallel processing power that back then cost tens of millions of dollars," Khosrowpour says. "Now, Dell Precision Data Science Workstations are preferred choices for cost-effectively developing diverse AI models and running the machine learning cycles to train them."

In fact, Precision Data Science Workstations feature special thermal engineering to enable tower and rack models to run the most advanced multicore CPUs available, plus up to four top-end, professional GPUs, with multiple terabytes of RAM and massive storage. "With Precision workstations, the configurations available for AI algorithm development and machine learning can suit just about any requirement," Khosrowpour says. "Edge use cases are growing, where AI-based inference engines can monitor key parameters on vast data flows and make decisions and issue alerts when exceptions occur."

Dell Optimizer, powered by AI to enhance performance

As an example of innovating with AI, Khosrowpour points to Dell Optimizer, the AI-based software developed using Dell Precision workstations that comes with Dell Precision workstations and many Dell PCs. "Like a hidden hand in the background, Dell Optimizer learns and responds to how users work," he says. "In short order, it can improve the user experience, app performance and mobility, among the many other enhancements its AI enables."

Of course, Khosrowpour uses Dell Precision workstations in his daily work as does his colleague Marc Hammons, a senior distinguished engineer. They're part of a team responsible for incorporating AI into Dell products.

According to Hammons, the AI in Dell Optimizer holistically manages the diverse hardware and software operations that span the full technology stack in a Dell Technologies device. It then extends that to an individual user's behaviors. "The AI orchestrates the complex interactions of the Dell hardware components, such as the CPUs, GPUs, systems, apps and even users themselves," he says. "Dell Optimizer can also ease the IT device management burden, especially with its ability to apply policies, tweak settings and enable various features."

Machine learning on telemetric datasets

Hammons explains that the Dell Optimizer team uses anonymized telemetric data, drawn from the Dell device installed base with advanced user privacy and data collection safeguards in place, for rigorous machine learning cycles on Dell Precision AI-ready workstations. "To enhance Dell Optimizer features, we pull specific datasets into a workstation and run training exercises on it to identify features in the data that have significance," he says. "It takes a lot of iterations interleaved

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with adjustment periods, pulling data from solid state storage into RAM. Depending on the training, Dell Optimizer can accelerate the data manipulation and transformation, making the process go faster and saving us time."

Poised to lead the future of AI

No technology before AI has had the potential to "think" for itself, make independent decisions or even self-replicate. With those capabilities, AI promises to revolutionize how the modern world works, with impacts across just about every industry and facet of daily life.

Dell Technologies has been driving AI for many years and continues to expand the portfolio to offer AI developers a broad collection of advanced, AI-ready validated designs for a wide range of specific AI use cases. "These are tested and proven infrastructure configurations for the likes of automating machine learning, inferencing with GenAI, and delivering conversational AI for chatbots and virtual assistants," says Khosrowpour. "We want to simplify AI development to help unlock its potential to transform and benefit the world." Customers looking to start or extend their AI journey have a partner with Dell Technologies. Dell Technologies can help them take the first steps, hitting the ground running as customers push for new boundaries and discover their potential for greater success.

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Dive Deeper Into AI Powered by Dell Precision Workstations.

Learn More About Dell Optimizer.

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