

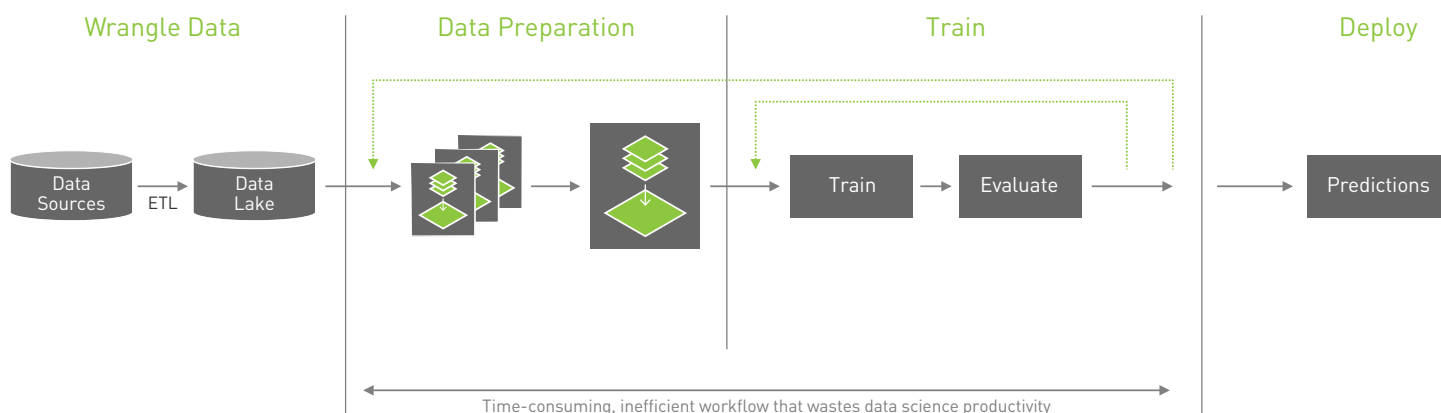


A NEW BREED OF WORKSTATIONS FOR DATA SCIENCE POWERED BY QUADRO AND CUDA-X AI

Data science is fundamentally changing the way companies do business. From consumer behavior to predictive analytics, companies of all sizes across telecom, finance, retail, and other industries are now capturing, storing, and analyzing more data than ever before. Companies today use machine learning, deep learning, and data analytics to better understand their daily operations, learn more about customer behavior, and ultimately design better products and services.

While tools and technologies have emerged to accelerate data science workflows, many data science projects still fail because existing tools don't offer the speed and flexibility companies need to efficiently process and build accurate predictive models. NVIDIA-powered data science workstations deliver a high-performance, enterprise-class solution that dramatically boosts productivity, speeds up time to insight, and lowers the cost of data science projects.

Bringing GPU-Acceleration to Data Science Workflows



The image above shows a typical machine learning workflow. Though day-to-day work can take a variety of paths through these steps, data scientists typically spend a large portion of their time doing prototyping and research. With NVIDIA-powered data science workstations, data scientists can harness the

power of GPUs to accelerate the things they do most often. Data preparation feature engineering, training, and more, can all be sped up, which will allow data scientists to make better forecasts and predictions.

UP TO 30X*¹ FASTER DATA PREPARATION

Companies today have massive amounts of data originating from multiple sources. The data can have inconsistencies that need to be normalized before model training can begin in the data preparation stage. Data scientists often use tools like pandas to perform the data processing within data preparation, but CPU-based processing is slow and cumbersome, limiting their ability to fine tune their approach and get the desired results.

NVIDIA-powered data science workstations feature a GPU-accelerated software stack that includes RAPIDS, an open source set of data processing and machine learning libraries incubated by NVIDIA and built on CUDA-X AI, the NVIDIA collection of GPU accelerated libraries, to bring instant GPU acceleration to data preparation. Data scientists can gain all of the benefits of GPU acceleration and experience faster data preparation with the addition of just a few lines of code - no need to learn new tools, learn CUDA, or to change their workflow.

UP TO 8X* FASTER MODEL TRAINING

Once data has been prepped, it is then processed by machine learning algorithms during the model training stage of the workflow. Historically, model training is difficult to parallelize because it requires a large amount of memory capacity to work at peak performance. NVIDIA-powered data science workstations are built on NVIDIA® Quadro RTX™ GPUs for up to 96GB of ultra-fast, local GPU memory. They also feature GPU-accelerated versions of popular machine learning algorithms, like XGBoost and many more, so that you can train models at top speed.

INTERACTIVE DATA VISUALIZATION

Data visualization is where everything comes together - data scientists can now glean insights from the millions of data points to forecast their business planning. NVIDIA-powered data science workstations bring a new level of real-time interactivity to data visualization. Quadro RTX 8000 GPUs are powered by the NVIDIA Turing architecture and NVIDIA RTX™ platform to deliver high-performance local visualization. Data scientists can also leverage the integration of RAPIDS with ISV partners in the data visualization ecosystem, including Graphistry and OmniSci, to interact with their datasets like never before.

UP TO 10X* SPEED UPS END-TO-END²

NVIDIA-powered data science workstations bring GPU acceleration to the entire data science workflow, from data preparation and feature engineering, to model training and validation. These groundbreaking end-to-end performance gains fundamentally change the way data scientists work. With massive local memory capacity, and GPU-accelerated data science software, NVIDIA-powered data science workstations offer an enterprise-grade solution that data scientists can rely on.

¹ Test shows performance improvements versus traditional CPU. Run on CPU Intel Xeon 6140 @ 3.2GHz, 3.7GHz Turbo, 384GB RAM, Ubuntu 16.04.4, NVIDIA driver 410.93
² End-to-end time = ETL + Conversion + Training + Validation.

Get Started with NVIDIA-Powered Data Science Workstations

NVIDIA-powered data science workstations are a powerful and efficient solution for data science development. They feature dual RTX 8000 GPUs for up to 96 GB of GDDR6 memory to handle the largest datasets. They also include a collection of GPU-accelerated data science software that is built on CUDA-X

AI to take full advantage of NVIDIA GPUs. The result is an integrated hardware and software solution that delivers all of the benefits of workstation grade hardware demanded by enterprise organizations.

Built for Enterprise

NVIDIA-powered data science workstations are tested and certified by NVIDIA in conjunction with system builders to ensure compatibility, reliability and optimal performance.

- > NVIDIA Quadro GPUs are built specifically for professionals and enterprise deployments.
- > GPU-accelerated data science libraries that are tested for cross-compatibility.
- > System configurations that are tested for NVIDIA GPU Cloud (NGC)-readiness to ensure quick and easy deployment of containers.
- > Optional software support services for NVIDIA developed software and containers.

GPU-Accelerated Software

DELIVERY

PYTHON PIP
NGC CONTAINERS
ANACONDA CONDA

DEVELOPMENT

PYTHON
NOTEBOOKS
VISUALIZATION

WORKFLOWS

KUBEFLOW PIPELINES
KUBERNETES

CORE FRAMEWORKS AND LIBRARIES



CUDA-X AI

DATA PROCESSING

cuDF

DALI

MACHINE LEARNING

cuML

cuGRAPH

DEEP LEARNING

cuDNN

cuBLAS

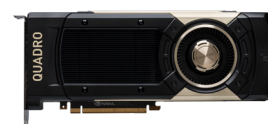
NCCL

TensorRT

NVIDIA-powered data science workstations are tested and optimized with data science software built on NVIDIA CUDA-X AI, a collection of over 15 libraries that enable modern computing applications to benefit from the NVIDIA GPU-

accelerated computing platform. Ready-to-run software for NVIDIA-powered data science workstation includes RAPIDS data processing and machine learning libraries, TensorFlow, PyTorch, and more.

NVIDIA Quadro RTX Hardware



GPUs	2X RTX 8000s	2X RTX 6000s	2X GV100s
GPU Memory	48 GB GDDR6	24 GB GDDR6	32 GB HBM2
Memory Bandwidth	672 GB/s	672 GB/s	870 GB/S
NVIDIA CUDA Cores	4608	4608	5120
NVIDIA Tensor Cores	576	576	640
NVIDIA RT Cores	72	72	–
Single-Precision Performance	16.3 TFLOPS	16.3 TFLOPS	14.8 TFLOPS
Double-Precision Performance	–	–	7.4 TFLOPS
Tensor Performance	130.5 TFLOPS	130.5 TFLOPS	118.5 TFLOPS
NVLink	2-way (2 and 3 slot) 100 GB/s Bidirectional	2-way (2 and 3 slot) 100 GB/s Bidirectional	2-way 200 GB/s
Display Support	4x DP 1.4 + 1x VirtualLink	4x DP 1.4 + 1x VirtualLink	4x DP 1.4
Power Consumption	295W	295W	250W

Industry Use Cases

TELECOM	<ul style="list-style-type: none"> > Detect network/security anomalies to reduce risk and theft. > Forecast network performance to predict maintenance issues. 	<ul style="list-style-type: none"> > Employ network resources optimization to increase network utilization.
FINANCIAL SERVICES	<ul style="list-style-type: none"> > Predict claim fraud to reduce loss. > Deploy customer service chatbots/routing to increase support coverage. 	<ul style="list-style-type: none"> > Leverage risk evaluation to minimize/prevent loss and make better decisions.
RETAIL	<ul style="list-style-type: none"> > Tune supply chain and inventory management to reduce costs. > Optimize price management/markdown to increase sales. 	<ul style="list-style-type: none"> > Utilize promotion prioritization and ad targeting to increase traffic.
HEALTHCARE	<ul style="list-style-type: none"> > Predict epidemic diseases to better improve clinical care. 	<ul style="list-style-type: none"> > Drive operational efficiency. > Speed drug discovery.
CONSUMER INTERNET	<ul style="list-style-type: none"> > Give better media recommendations to increase customer retention and satisfaction. 	<ul style="list-style-type: none"> > Send more personalized advertisements to increase click-through rates and reduce churn.
MANUFACTURING	<ul style="list-style-type: none"> > Calculate remaining useful life estimations. > Predict equipment failure for prescriptive maintenance. 	<ul style="list-style-type: none"> > Optimize demand planning and supply chain forecasting.

Data Science Software Partners

 ANACONDA	 BLAZINGDB	 DATALOGUE	 graphistry
 H ₂ O.ai	 kinetica	 MAPR	 omni sci

Available from Global and Regional Workstation Providers

 AMAX	 COLFAX Customized Solutions	 BOXX
 Microway	 EXXACT	 THINKMATE HIGH PERFORMANCE COMPUTING
 IMAGES & TECHNOLOGIE	 RAVE COMPUTER 3D DESIGN	 OSS ONE STOP SYSTEMS

For more information visit: www.nvidia.com/data-science-workstation

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