LSU Health Shreveport

Improving Healthcare with
NVIDIA DGX POD™
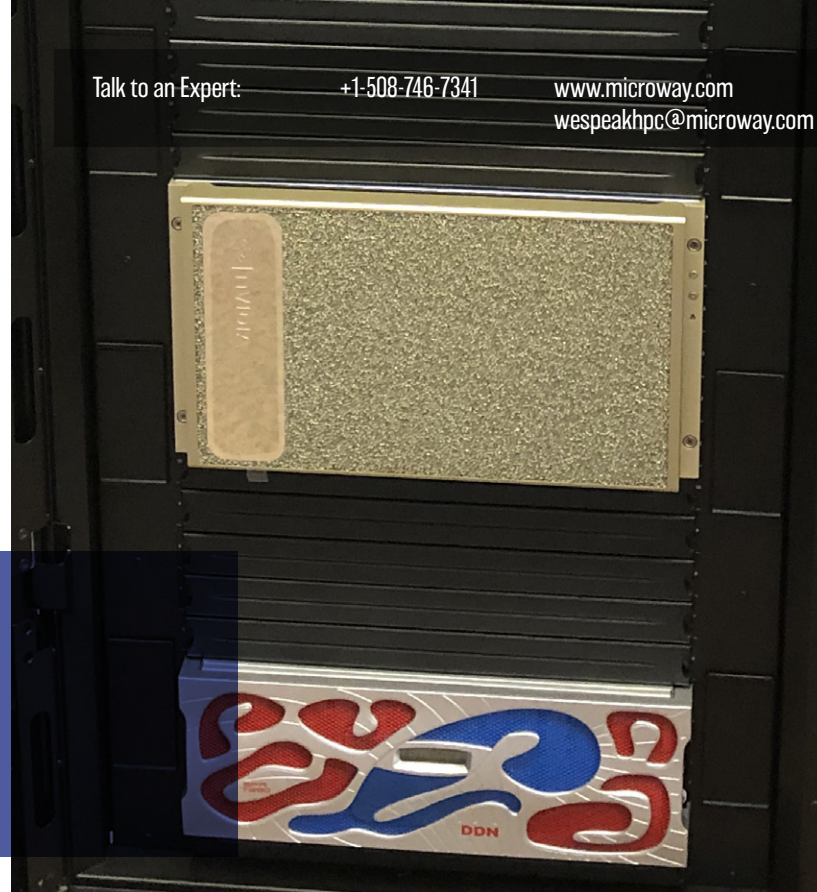
LSU Health Shreveport has deployed a new **NVIDIA DGX POD**, a reference architecture that incorporates best practices for AI scale built on NVIDIA DGX, to help advance understanding of our brains. Brain structure and function are very complex, and brain imaging is a foundational capability that benefits from advanced image processing. One of the key aspects of brain imaging is spatial normalization that can provide better image fidelity and improve research. With innovative techniques LSU Health Shreveport is enabling deeper understanding of brain imaging through faster turnaround, higher fidelity images, and new types of AI-based patient analysis.

THE DEPLOYMENT

▶ NVIDIA DGX POD

DGX POD combines compute, networking, storage, & more in an integrated AI infrastructure. It enabled LSU Health Shreveport to select & deploy a bleeding-edge deployment, fast. DGX POD offers predictable performance, capacity, & capability via tight integration of NVIDIA DGX systems & DDN A³I® storage.

▶ DGX A100 AI SYSTEM

NVIDIA DGX™ A100 is the universal system for all AI workloads, offering unprecedented compute density, performance & flexibility in the world's first 5 petaFLOPS AI system. It provides the supercomputing & AI horsepower for LSU Health Shreveport's DGX POD deployment.

▶ DDN 7990X STORAGE

DDN A³I solutions accelerate end-to-end data pipelines for AI workflow running on DGX systems. LSU Health Shreveport's DDN 7990X brings the same advanced storage technologies powering the world's largest supercomputers to their DGX POD—for a data pipeline easy to deploy & manage.

▶ AMD EPYC PROCESSORS

The NVIDIA DGX A100 system features eight NVIDIA GPUs and two 2nd Gen AMD EPYC™ processors. The AMD EPYC processors provide the CPU building block of each DGX A100 system: providing up to 64 cores each of x86 compute power & PCI-E Gen 4 host interconnect for the GPUs.
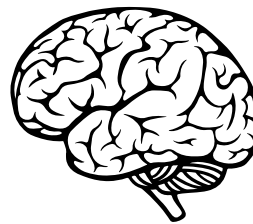
New neurobiology research is probing deeper into the brain with advanced brain imaging enhanced by a big dose of compute power.

Brain imaging is an iterative process, with algorithms that may take several days to complete. Since brains are unique, spatial normalization is a key way to better fit the brain image with the algorithm.

The structure of the brain is then combined with the patient's genetic information, brain function & psychology. This provides a more complete view of the patient. With advanced imaging compute capabilities variants of protein folding in the brain can be studied, so folding errors can be studied in terms of brain structure & disease.

The team is building new tools that will merge the power of accelerated imaging with AI-based data analysis to better understand our brains & correlations with addiction.

LSU Health Shreveport

LSU Health Shreveport is one of two Health Sciences Centers of the Louisiana State University System & one of only 154 in the nation. LSU Health Shreveport is home to the Schools of Medicine, Graduate Studies, & Allied Health Professions, and a robust research enterprise. Over 900 students are enrolled in the degree programs.

Case Study

"Advanced brain imaging benefits from increased image fidelity to advance the science and treatment of the brain. Microway has been an important technology partner that brings the power of a supercomputer at an affordable price so we can create high fidelity brain images faster. Brain scans have increased to 3-4 a week from 4-6 a month so we have more data for better science"
- Dr. James Patterson, Chairman of the Department of Psychiatry and Behavioral Medicine at LSU Health Shreveport

THE PROCESS

The LSU Health Shreveport system was designed, developed, and optimized by Microway in close collaboration with NVIDIA and DDN. The deep integration of DDN AI storage appliances with DGX systems ensures a reliable experience.
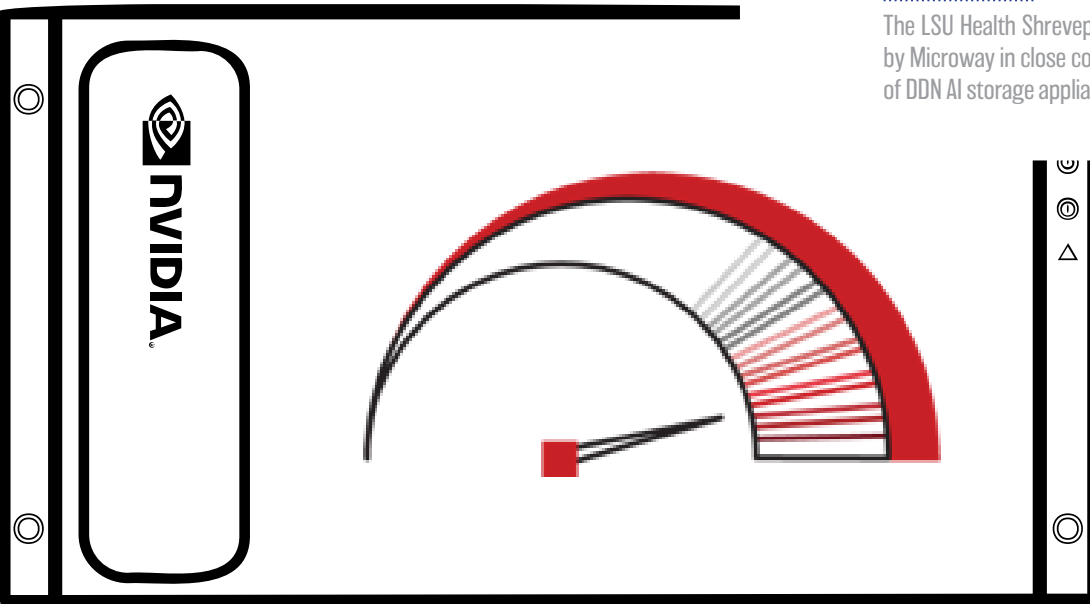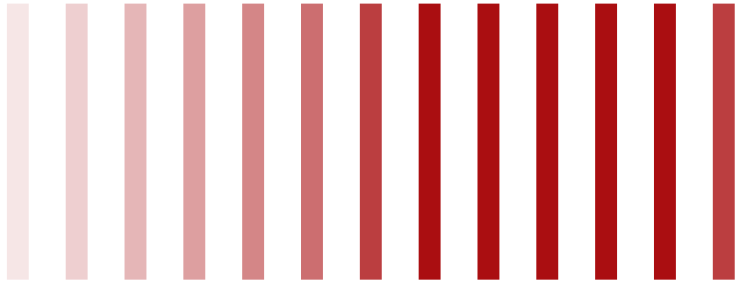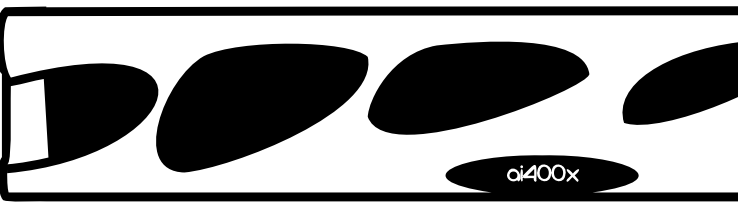
ABOUT MICROWAY

Microway designs and builds hardware solutions for the intersection of AI and HPC. These include clusters, servers, quiet workstations designed for bleeding-edge computational performance. Microway also delivers the data-planes that keep up with these advanced workloads—with a complete array of storage and network offerings.

Since 1982, customers have trusted Microway to design and deliver them unique and superior hardware—enabling them to remain at the forefront of supercomputing and solve the world's toughest challenges.

Microway's strategic partners include NVIDIA, AMD, and DDN. Classified as a small business, woman owned and operated, Microway's GSA Schedule is GS-35F-0431N.

▶ Louisiana State University's endowed chair program contributed $3 million to a project to advance brain research.

▶ Dr. James Patterson, the Chairman of the Department of Psychiatry and Behavioral Medicine at LSU Health Shreveport, engaged NVIDIA and Microway to help deploy a leading GPU and AI system for his work.

▶ Through extensive design research and consultation with outside experts, LSU Health Shreveport settled on an NVIDIA DGX POD architecture for their deployment.

▶ Microway, DDN, and NVIDIA collaborated to tailor a DGX POD architecture to LSU Health Shreveport's unique workload, data, budget, and facilities requirements.

▶ Microway's experts assembled, burn-in tested, installed, & integrated the complete compute, storage, software and networking deployment. After preparation at Microway, the deployment shipped to the customer for immediate bringup—all orchestrated amidst a global pandemic.

▶ The LSU Health Shreveport team has worked to transform their code. By implementing OpenACC-based acceleration and new AI & Deep Learning algorithms via TensorFlow, they aim to revolutionize their application.