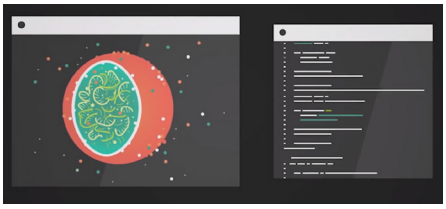
GPUs PROPEL DATA-DRIVEN DISCOVERIES IN HEALTH RESEARCH

Big data can better inform research, clinical studies, and observational and epidemiological exploration to advance scientific discoveries and empower governments to improve the quality of life.

To realize the full potential of big data, leading health and research institutions are already using NVIDIA GPUs to build out comprehensive data ecosystems and accelerate analytics.

GPUs can ingest and compute data at an unprecedented rate, speeding up and expanding the scope of research and results. With state-of-the-art technology, federal researchers can share relevant and actionable insights with the medical community.

ROBUST DATA ECOSYSTEM



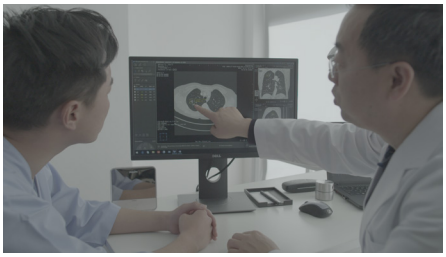
According to a 2013 study, the promise of improving health care through the ready access and integration of health data has drawn significant national attention and federal investment in the U.S. The study identifies two main benefits of a strong data infrastructure: improved care and lower costs.

At the same time, the research showed that this move is faced with key challenges, such as data interoperability and patient data privacy. The study recommends investing in an integrated software architecture that can run at multiple scales: on a single box, in the cloud, or on shared federated systems. Ultimately, it's the centralization of data that can support discovery and critical insights.

In 2018, the Scripps Research Translational Institute partnered with NVIDIA to develop AI and deep learning best practices and tools. Together, they also built a centralized infrastructure to tackle the deluge of genomics and sensor data. Deep learning can be used to predict phenotypic information from mutation detections, which, when combined with digital sensor data, opens up a new world of disease prevention and intervention.

This combination of integrated data infrastructure with computing resources near data sources can power unprecedented exploration.

CUTTING-EDGE DATA EXPLORATION TOOLS



Despite the immense promise of integrated data, there isn't a clear path for moving research outcomes into production or actionable information.

Current data analytics tools are difficult to fit into complex and emerging workflows, adding a burden to researchers.

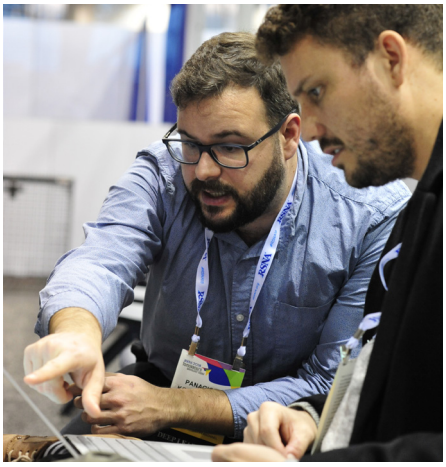
NVIDIA® DGX™ supercomputers supply GPU-optimized software and simplified management tools as a fully integrated solution for AI-powered analytics. With DGX, researchers can move from the desk to the data center to the cloud efficiently.

Facilities like Massachusetts General Hospital are already using NVIDIA DGX to analyze complex data, comparing individual patient's tests and history with billions of data points from population data of other patients they have collected.

In another example, researchers from the National Institute of Health and the Intellectual Ventures' Global Good Fund trained a convolutional neural network on approximately 30,000 digitized cervical-screening images from more than 9,000 participants, taken with a fixed-focus camera ("cervicography"). They used GPU-optimized TensorFlow and Keras frameworks on an NVIDIA DGX to develop a deep learning–based proof-of-concept that can evaluate cervical images for cancer.

The future of healthcare research in areas like life sciences depends on the capability to extract insights from ever-increasing, multi-modal data.

WORKFORCE DEVELOPMENT



It's critical for researchers to learn and leverage the latest AI tools and technologies that can speed up the path to breakthroughs.

NVIDIA has developed the Deep Learning Institute (DLI), which offers hands-on training in deep learning, accelerated computing, and data analytics, to help individuals and organizations develop skills in the latest AI techniques. Examples of deep learning in healthcare courses include "Data Science Workflows for Deep Learning in Medical Applications" and "Data Augmentation and Segmentation with Generative Networks for Medical Imaging." The broad experience of DLI instructors in many domains helps them develop a curriculum that's applicable in the field.

At the 2018 annual meeting of the Radiological Society of North America, a deep learning classroom hosted by NVIDIA trained more than 1,000 attendees in over 22 separate hands-on sessions on deep learning tools, algorithm writing, and AI technology.

GPUs ENABLE THE FUTURE OF RESEARCH

To fully unlock a detailed understanding of the makeup, functions, and processes of the human body—as well as its surrounding environment—federal researchers need to invest in and deploy tools that can support big data.

Visit NVIDIA in Healthcare to learn more about the range of tools available for research and healthcare institutions.

NVIDIA