



NVIDIA Teams with National Cancer Institute, U.S. Department of Energy to Create AI Platform for Accelerating Cancer Research

'CANDLE' AI Software to Deliver a Decade of Cancer Advances in Just Five Years

NVIDIA today announced that it is teaming up with the National Cancer Institute, the U.S. Department of Energy (DOE) and several national laboratories on an initiative to accelerate cancer research.

The initiative -- known as the Cancer Moonshot, announced by President Barack Obama during his 2016 State of the Union Address, and led by Vice President Joseph Biden -- aims to deliver a decade of advances in cancer prevention, diagnosis and treatment in just five years. The research efforts include a focus on building an AI framework called CANDLE (Cancer Distributed Learning Environment), which will provide a common discovery platform that brings the power of AI to the fight against cancer.

CANDLE will be the first AI framework designed to change the way we understand cancer, providing data scientists around the world with a powerful tool against this disease.

Teams collaborating on CANDLE include researchers at the National Cancer Institute (NCI), Frederick National Laboratory for Cancer Research and DOE, as well as at Argonne, Oak Ridge, Livermore and Los Alamos National Laboratories. NVIDIA engineers and computational scientists will contribute to all elements of this framework by jointly developing an AI software platform optimized for the latest supercomputing infrastructure, with the goal of achieving 10X annual increases in productivity for cancer researchers.

"AI will be essential to achieve the objectives of the Cancer Moonshot," said Rick Stevens, associate laboratory director for Computing, Environment and Life Sciences at Argonne National Laboratory. "New computing architectures have accelerated the training of neural networks by 50 times in just three years, and we expect more dramatic gains ahead."

"GPU deep learning has given us a new tool to tackle grand challenges that have, up to now, been too complex for even the most powerful supercomputers," said Jen-Hsun Huang, founder and chief executive officer, NVIDIA. "Together with the Department of Energy and the National Cancer Institute, we are creating an AI supercomputing platform for cancer research. This ambitious collaboration is a giant leap in accelerating one of our nation's greatest undertakings, the fight against cancer."

The Cancer Moonshot strategic computing partnership between the DOE and NCI to accelerate precision oncology includes three precision medicine pilot projects that aim to provide a better understanding of how cancer grows; discover more effective, less toxic therapies than existing ones; and understand key drivers of their effectiveness outside the clinical trial setting, at the population level. Deep learning techniques are essential for each of these projects.

First, CANDLE will be used to help discover the underlying genetic signatures present in DNA and RNA of common cancers that are predictive of treatment response from the mass of molecular data collected by the NCI genomic data commons. Second, CANDLE will accelerate the molecular dynamic simulations of key protein interactions to understand the underlying biological mechanisms creating conditions for cancer. Third, through semi-supervised learning, CANDLE will automate information extraction and analysis of millions of clinical patient records to build a comprehensive cancer surveillance database of disease metastasis and recurrence.

"Large-scale data analytics -- and particularly deep learning -- are central to LLNL's growing missions in areas ranging from precision medicine to assuring nuclear nonproliferation," said James M. Brase, Deputy Associate Director for Computation, Lawrence Livermore National Laboratory. "NVIDIA is at the forefront of accelerated machine learning, and the new CORAL/Sierra architectures are critical to developing the next generation of scalable deep learning algorithms. Combining NVLink-enabled Pascal™ GPU architectures will allow accelerated training of the largest neural networks."

Georgia Tourassi, Director of the Health Data Sciences Institute at Oak Ridge National Laboratory, said, "Today cancer surveillance relies on manual analysis of clinical reports to extract important biomarkers of cancer progression and outcomes. By applying high performance computing and AI on scalable solutions like NVIDIA's DGX-1™, we can automate and more readily extract important clinical information, greatly improving our population cancer health understanding."

More Resources

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- [NVIDIA Deep Learning](#)

- [NVIDIA DGX-1](#)
- [The Intelligent Industrial Revolution](#) by NVIDIA CEO Jen-Hsun Huang

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[NVIDIA](#) (NASDAQ: NVDA) is the AI computing company. Its invention of the GPU in 1999 sparked the growth of the PC gaming market, redefined modern computer graphics and revolutionized parallel computing. More recently, GPU deep learning ignited modern AI -- the next era of computing -- with the GPU acting as the brain of computers, robots and self-driving cars that can perceive and understand the world. More information at <http://nvidianews.nvidia.com/>.

Certain statements in this press release including, but not limited to, statements regarding the impact, benefits and goals of the Cancer Moonshot, the CANDLE AI framework, the combination of NVLink-enabled Pascal GPU architectures, and NVIDIA DGX-1; NVIDIA's participation in CANDLE; AI and deep learning techniques being essential to achieve the Cancer Moonshot objectives; expected gains in training neural networks for cancer research; large-scale data analytics and deep learning being central to Lawrence Livermore National Laboratory's missions; NVIDIA being at the forefront of accelerated machine learning; and CORAL/Sierra architectures being critical to developing scalable deep learning algorithms are forward-looking statements that are subject to risks and uncertainties that could cause results to be materially different than expectations. Important factors that could cause actual results to differ materially include: global economic conditions; our reliance on third parties to manufacture, assemble, package and test our products; the impact of technological development and competition; development of new products and technologies or enhancements to our existing product and technologies; market acceptance of our products or our partners' products; design, manufacturing or software defects; changes in consumer preferences or demands; changes in industry standards and interfaces; unexpected loss of performance of our products or technologies when integrated into systems; as well as other factors detailed from time to time in the reports NVIDIA files with the Securities and Exchange Commission, or SEC, including its Form 10-Q for the fiscal period ended July 31, 2016. Copies of reports filed with the SEC are posted on the company's website and are available from NVIDIA without charge. These forward-looking statements are not guarantees of future performance and speak only as of the date hereof, and, except as required by law, NVIDIA disclaims any obligation to update these forward-looking statements to reflect future events or circumstances.

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