

Challenges

- > Improving diagnoses and patient care in the U.K.'s National Health Service (NHS).
- > Disrupting twelve clinical pathways in oncology, cardiology, neurology, and radiology with AI.
- > Assisting radiologists in meeting the increasing demand for radiology imaging.
- > Optimizing the value (outcome/cost) of the full care pipeline.
- > Bringing AI to clinical environments using federated learning.

Key NVIDIA Solution Points

- > The ability to scale training across multiple GPUs and sites.
- > NVIDIA DGX-2's large memory and compute power.
- > Extensive support from the NVIDIA System Architect and Engineering teams.

Results

- > Improved patient care
- > Significant financial savings
- > Optimising triage and targeting resources
- > Better definition of cohorts for studies and clinical trials
- > Developing AI in clinical environments via federated learning

KING'S COLLEGE LONDON IS WORKING TO BRING AI BENEFITS TO THE POINT OF CARE

"The infrastructure is an essential part of building AI tools which will benefit the whole healthcare system. The NVIDIA DGX-2 AI system's large memory and 2 petaflops of computing power makes it possible for us to tackle the training of large, 3D datasets in minutes instead of days."

- **Professor Sebastien Ourselin**, Head of the School of Biomedical Engineering & Imaging Sciences at King's College London.

Improving Diagnosis and Patient Care

NVIDIA and King's College London are collaborating to bring artificial intelligence in medical imaging to the point of care. In contrast to traditional medical testing, which involves sending scans for further analysis by specialists, point of care testing allows the results gained from X-rays, CT scans or MRI to be delivered immediately at the time of the patient-doctor interaction.

This is part of King's ongoing London Medical Imaging and Artificial Intelligence Centre for Value-Based Healthcare project, which aims to disrupt twelve clinical pathways in oncology, cardiology, and neurology as well as improve diagnoses and patient care in the U.K.'s National Health Service (NHS).

Products Used

- > NVIDIA® DGX-2™
- > x4 NVIDIA® DGX-1™
(One for each of the hospitals)
- > NVIDIA Clara™ Platform
- > NVIDIA GPU Cloud

Software Used

- > NiftyNet (King's College London)
- > NVIDIA Clara™

NVIDIA DGX-2 Powers AI at the Point of Care

King's is implementing the NVIDIA® DGX-2™ AI system as part of the first phase of the project. The system's large memory and 2 petaflops of computing prowess enables the team to tackle the training of large, 3D datasets in minutes instead of days.

In addition, researchers and engineers from NVIDIA and King's will join clinicians from major London hospitals on-site at King's College Hospital, Guy's and St Thomas', and South London and Maudsley. The combination of research, technology and clinicians will accelerate the discovery of critical data strategies, targeted AI problems and speed-up deployment in clinics.

Driving Healthcare Breakthroughs

For the first time in the NHS, federated learning will be applied to algorithm development. Federated learning allows AI algorithms to be developed on site, using data from each individual hospital, without the need for data to travel outside of its own domain.

This approach is crucial for the development of AI in clinical environments where the security and governance of data is of the highest importance.

The work could lead to breakthroughs in classifying stroke and neurological impairments, determining the underlying causes of cancers, as well as recommending the best treatment for patients.

About King's College London

King's College London is one of the top ten UK universities and the fourth oldest university in England. The School of Biomedical Engineering & Imaging Sciences within King's is fully embedded into St Thomas' Hospital. Their close partnership enables world-class clinical practice and cutting-edge research to create transformative change in healthcare.

King's, Guy's and St Thomas', King's College Hospital and South London and Maudsley NHS Foundation Trusts are part of King's Health Partners. King's Health Partners Academic Health Sciences Centre (AHSC) is a pioneering global collaboration.



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Learn more about King's College London at: www.kcl.ac.uk

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