Academic Research | Australia

Accelerating research with AI

The University of Queensland

To support its cutting-edge research, The University of Queensland deployed an HPC environment based on Lenovo's ThinkSystem SR685a V3 powered by AMD Instinct MI300X accelerators. With extremely high-density GPU memory, the solution runs AI workloads much faster, reducing model training times.

1 Customer background

Who is The University of Queensland?

The University of Queensland is one of Australia’s leading universities and among the world’s top 50 universities. UQ is driven by its mission to deliver for the public good through its transformative education, pioneering research, and meaningful engagement with local and global communities.

2 The challenge

To help its researchers make a global impact, UQ aims to equip them with the High Performance Computing (HPC) capabilities they need to drive their pioneering work. The latest innovations in AI promise to open important new avenues of research.

Jake Carroll, Director of the Research Computing Centre at The University of Queensland, says: “Using AI and a new HPC infrastructure, researchers and scientists are beginning to unlock many more of the brain's secrets. From autism to vision, this research is helping us understand our own brains better.”

“AI applications like large language models [LLMs], generative AI, computer vision, machine learning, and even simulation all have **huge potential in research** in medicine. Working with technology companies, we've built innovative HPC platforms that put some of the **highest-performing infrastructure in Australia** in the hands of researchers.”

Jake Carroll

Director, Research Computing Centre, The University of Queensland

3 The solution

Optimized for AI

Teaming up with Lenovo, UQ has deployed a brand-new HPC platform built on Lenovo's ThinkSystem SR685a V3 servers powered by AMD Instinct MI300X accelerators.

With 192 GB of HBM3 high-bandwidth memory on eight tightly integrated GPUs, the solution can easily run LLMs with many billions of parameters.

Hardware

Lenovo ThinkSystem SR685a V3
AMD Instinct MI300X Accelerators

3 The solution

Facilitating groundbreaking work

UQ is the very first organization in Australia’s education sector to leverage the Lenovo and AMD solution.

One of the first research teams to use the platform was led by Dr. Shekhar Chandra, ARC Future Fellow at the School of Electrical Engineering and Computer Science.

Dr. Chandra explains: “I'm currently focused on finding ways to speed up MRI scanning and make the scans themselves more affordable. We utilize computer vision in our work, which requires computationally intensive training of AI models. The HPC solutions allow us to do this training at scale, faster.”

“There's no denying that AI can be power hungry, but with diligent management, careful engineering, smart component choices, and platform optimization, UQ has integrated a HPC system that **runs efficiently** using only the power that the AI chips need.”

Jake Carroll

Director, Research Computing Centre, The University of Queensland

4 The results

As researchers take advantage of the new HPC resources, it has the possibility to lead to faster outcomes and breakthroughs.

Dr. Chandra says: “We’ve accelerated one of our computer vision training workloads from four days to just five and a half hours—17.5 times faster. Ultimately, this is allowing us to train better models that get more information out of MRI scans, and that will better support doctors with diagnoses.”

- Faster training for AI models
- Supports innovative research
- Optimizes power consumption

4 The results

Supporting researchers

Today, UQ researchers are using the Lenovo ThinkSystem platform for their research projects.

Claire Cheng, PhD student and Researcher at the School of Chemistry & Molecular Biosciences, says: “I’m building an LLM-style model to translate mouse genome information into human genome information. In the past, training my model on such vast datasets took weeks, but now it takes just 10 hours.”

“Lenovo is thrilled to collaborate with The University of Queensland, empowering its **world-class researchers** with Lenovo’s cutting-edge HPC solutions featuring the latest AMD processor and GPU technology. By **accelerating the University’s research workloads**, we’re proud to enable research discoveries that **push the boundaries of science** and help create a better future.”

Sinisa Nikolic

Director High Performance Computing & AI, Lenovo

Why Lenovo?

As well as offering a dense HPC footprint for the data center, the Lenovo solution provides UQ with power optimization for researchers' demanding AI workloads and headroom for expansion as its volume and velocity of data continue to grow.

Carroll elaborates: "We're already planning to deploy agentic AI to extend the capabilities of our digital research infrastructure. When you give world-class tools to world-class minds, breakthroughs follow. We're not just building infrastructure: we're enabling discovery."

How can universities accelerate research breakthroughs?

With a new HPC solution powered by Lenovo ThinkSystem servers,
The University of Queensland is empowering teams with cutting-edge AI technology.

Explore Lenovo HPC Solutions