From Discovery to Impact:

Deakin University Powers Transformative AI Research with WEKA

Deakin University achieves 10X performance improvements with NeuralMesh™ by WEKA, accelerating breakthrough cerebral palsy research and empowering 80+ researchers.

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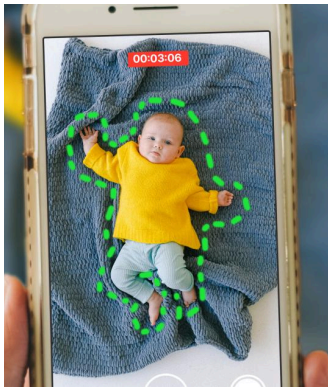
At Deakin University's Applied Artificial Intelligence Initiative, the mission is clear: **explore fundamental machine learning problems, invent novel solutions, and translate those solutions into products that improve society.** It's AI research with purpose, grounded in the belief that technology should solve challenges no one else can.



Among the initiative's most profound projects is research aimed at early detection of cerebral palsy in infants in partnership with the Cerebral Palsy Alliance, work that exemplifies their commitment to tackle real-world problems using methods grounded in modern machine learning and deep learning. Using computer vision to analyze movement patterns in video data, Dr. Romero Almeida Barata De Morais and the Deakin team are working with world-leading clinical experts and cerebral palsy researchers to develop AI models that can identify developmental concerns months or even years earlier than traditional methods allow. This research has the potential to

transform outcomes for children and families worldwide by enabling access to early interventions that can dramatically improve a child's developmental trajectory.

Home to **over 80 researchers** including computer scientists, mathematicians, engineers, and software developers, plus a vast network of affiliated experts across health, defense, business, and government, the initiative is built to deliver transformative technologies. But as the cerebral palsy screening project and dozens of other research areas grew more ambitious, processing vast datasets and training increasingly complex models, the team faced a critical challenge: their legacy storage infrastructure couldn't keep pace with their mission to solve society's pressing problems.

The Challenge: When Infrastructure Becomes a Barrier to Breakthrough

For researchers striving to conquer unique challenges, speed is essential. The sooner accurate screening tools reach clinical practice, the sooner people can access methods that dramatically improve lives.

"**Our old system couldn't handle the I/O required for modern research**, especially GPU-heavy workloads," explained Aiden Molluso, AI Systems Administrator at Deakin Applied AI.

The bottleneck extended across the initiative's diverse portfolio of fundamental and applied research. Computer vision projects, large language model development, and GPU-intensive experiments all suffered from inadequate IOPS performance on the 850TB mirrored storage setup. Researchers pioneering new methods and approaches for AI would sometimes **wait 10 minutes just for jobs to start**, with processes blocked in disk wait states. **Training epochs that should take minutes stretched to an hour or more.**

The legacy infrastructure slowed the pace of research aimed at accelerating scientific discovery, frustrated researchers, and ultimately delayed the journey from laboratory innovation to real-world outcomes.

The Solution: Infrastructure Built to Match the Urgency of Discovery

Deakin University needed infrastructure that could match the ambition and urgency of their mission. They found a partner in WEKA, working with implementation support from Xenon Systems to deploy NeuralMesh by WEKA, a high-performance storage system purpose-built for accelerated compute.

"NeuralMesh is incredible. It is now nearly instantaneous to start running jobs, whereas before I would sometimes wait with jobs blocked in a disk wait state," shared one researcher.

The solution centered on **436TB of raw NVMe storage across 10 servers**, deployed in parallel with the legacy system to ensure zero disruption during migration. NeuralMesh's architecture delivered the exceptional I/O performance that GPU-heavy workloads demand, while its centralized data management eliminated the need for researchers to transfer large datasets to local disks, a workflow improvement that enhanced collaboration across teams using machine learning and deep learning.

Perhaps most importantly, NeuralMesh's performance freed researchers to focus entirely on science. "With NeuralMesh, **our researchers no longer have to worry about what's happening in the background when they're running their experiments,**" said Aiden.

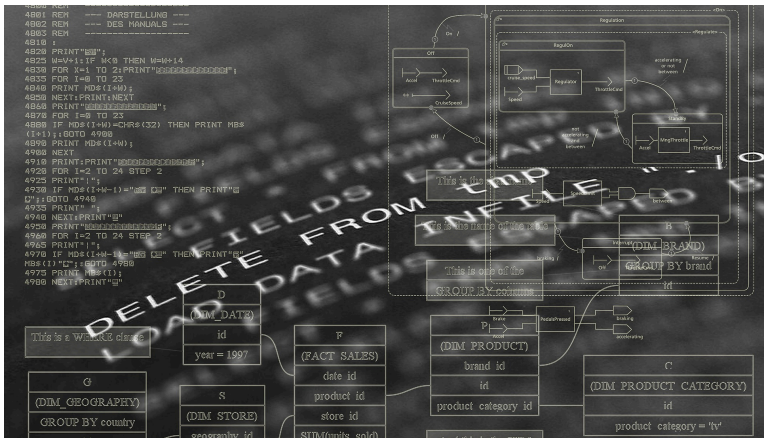
The Impact: Accelerating Progress with a 10X Improvement in Training Speed

The performance gains weren't just numbers on a benchmark. They translated directly into accelerated progress on research.

Jobs that previously sat blocked now started instantaneously. Training epochs that consumed 40 minutes to over an hour dropped to just 6 minutes—a **7 to 10x speed increase** that fundamentally changed what researchers could accomplish. For Dr. De Morais's cerebral palsy research, this meant the ability to process large video files smoothly, accelerating progress on work that could deliver transformative technology to enable earlier interventions for thousands of children across the globe.

The benefits extended beyond individual projects to the entire research community. With NeuralMesh handling the increasing focus on large language models and GPU workloads seamlessly, researchers gained the ability to tackle more challenges.

For the IT team supporting researchers dedicated to accelerating scientific discovery, the impact was equally transformative. NeuralMesh's automation and policy-driven management features eliminated the time-consuming manual storage administration that previously consumed their days. "We don't have to manage much on the storage side," Aiden explains. "Implementing NeuralMesh has made our jobs easier. Previously, a lot of time was spent managing the cluster's file system, but now it's almost set-and-forget."



This efficiency dividend freed IT staff to focus on strategic support for research

initiatives rather than routine maintenance, a shift that multiplied NeuralMesh's impact across the organization. Comprehensive training modules and responsive support from WEKA ensured smooth operations during upgrades, giving the team confidence in their infrastructure choices.

Researchers across the initiative expressed genuine gratitude for the transformation: "Thank you for implementing NeuralMesh. Performance is very much improved." These aren't just technical improvements. They're enablers of the work Deakin Applied AI exists to do: make discoveries that advance knowledge and build systems that benefit society.'

Looking Forward: Infrastructure that Grows with the Mission

As AI capabilities accelerate and models grow ever larger, Deakin Applied AI anticipates exponential growth in computational demands. The cerebral palsy screening project represents just one of many initiatives where larger datasets and more sophisticated models could unlock even greater impact, from improving diagnostic accuracy to expanding screening to other developmental conditions.

"Implementing NeuralMesh has given the institute the capability to keep pace with the growing demands of our researchers," Aiden explains. "As AI research intensifies and data needs grow, NeuralMesh's infrastructure has equipped us to handle the challenges ahead."

The team is already exploring NeuralMesh's object storage and archiving features to manage increasing data volumes, ensuring they can support future initiatives without requiring extensive infrastructure overhauls.

From earlier cerebral palsy diagnosis to breakthroughs yet to come in diverse sectors, NeuralMesh by WEKA is helping ensure that at Deakin Applied AI, the only limit to solving society's pressing problems is imagination, not infrastructure.