BUSHFIRE RESEARCH FIRES UP WITH DUG HPC.

In August 2020 DUG Technology was asked to partner with FDLAusNZ on the 2020 Bushfires Data Quest Challenge.

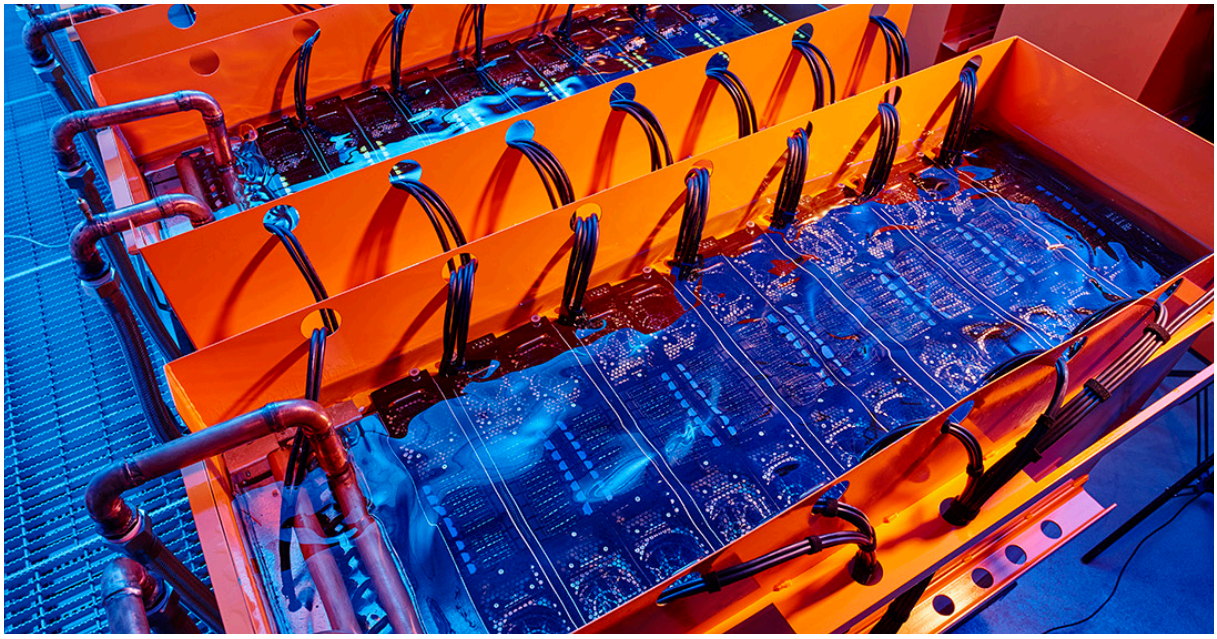
Data Quest is a one week research sprint that connects brilliant researchers with experts from space agencies, universities, government, and private enterprise to tackle unique problems that are often challenging in traditional academic or industrial research settings. The main premise of Data Quest is that the strongest solutions, with the greatest potential to make a difference to humankind, are built on collaboration.

This year's quest aimed to answer the question:
"Can AI, primed with data from multiple satellites and local sensor networks, detect fires earlier, predict fire behaviour, and help emergency services respond more effectively to protect homes, people and valuable natural capital?"

DUG was the lead technology partner for Data Quest, providing the CPU and GPU horsepower to train AI models in detecting, monitoring and modelling bushfires using satellite information. The combination of DUG's HPC storage, compute, expert support and universal access allowed the diverse FDLAusNZ teams to collaborate and explore the terrabytes of satellite imagery with ease.

With a strong focus on building demonstrated-solvability, the four research teams, spread across Australia and New Zealand, worked closely with DUG experts who set them up with full, interactive access to Jupyter workbooks, a plethora of AI tools, super fast IO and plenty of compute power. In a very short period of time the researchers developed complex workflows that were run interactively and seamlessly on DUG's HPC platform. Theories were rigorously tested and the teams were able to rapidly converge on solutions. The results were groundbreaking and potentially life changing.

One team initiated a technology that can develop a fire-risk map, based solely on satellite data, that is nearly 50 times more detailed than current examples, and have it update dynamically every five days. Such a tool, in the hands of a first responder could enable more tactical and effective firefighting.



The researchers demonstrated the potential of geo-stationary satellites, which sit over Australia and deliver an 'always-on' view, to provide early warning on fire ignition.

Importantly, it was shown that AI systems could match the performance of supercomputer modelling to help fire-fighters and communities understand the evolution of a bushfire. AI development is particularly significant given the complexities of bush-fire modelling. Any incremental improvements that enable local authorities to analyse data in the field more rapidly and make faster, better-informed decisions could help save property and life.

Finally, the research established that tracking smoke and cloud patterns from space, particularly changes in colour and behaviour, would provide critical insights into the level of fire-threat being presented.
This valuable information could provide lifesaving early-warning to fire-fighters and communities.

The 2020 Bushfires Data Quest Challenge was rapid, but incredibly important. It resulted in clear, demonstrable pathways and deployable tools for future use by our fire experts and first responders.

The team at DUG was honoured to be part of such an exciting collaboration of industry, technology, science and research. Boundaries of conventional thinking were pushed and real solutions that could improve our planet were discovered. DUG's technology platform was the launching pad of truly powerful thinking.