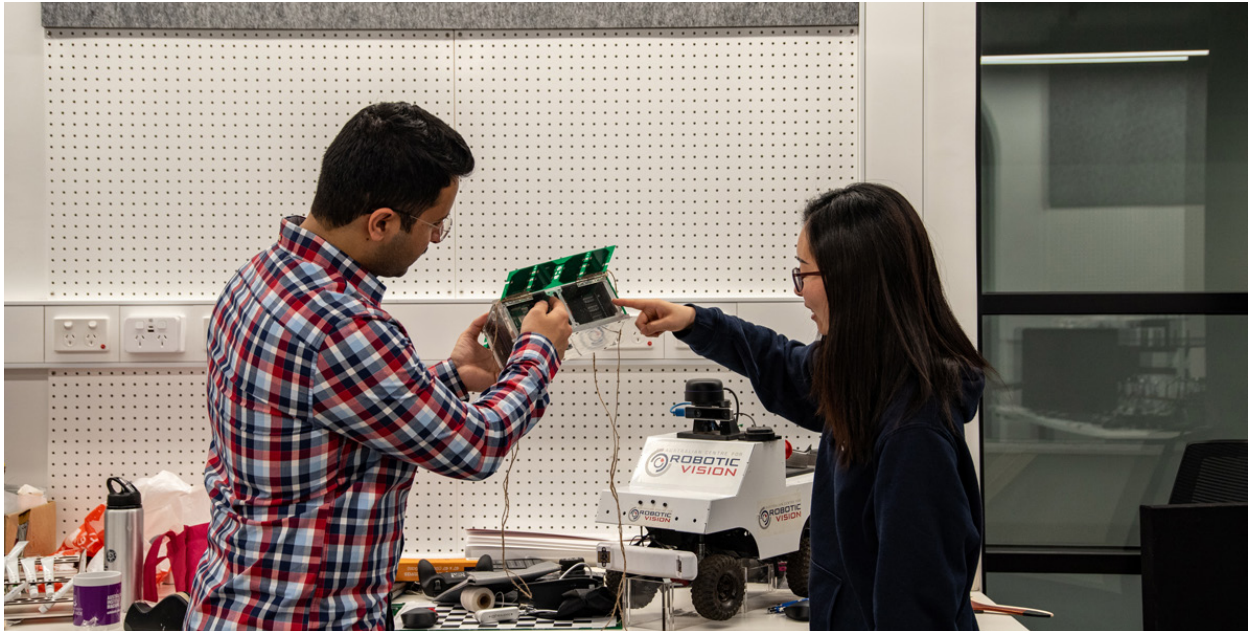


Capability Statement Critical_Technologies

LOT_
FOUR
TEEN

Critical technologies are those current and emerging technologies with the potential to greatly impact our national interests.



Australian Institute for Machine Learning (AIML), Lot Fourteen, North Terrace, Adelaide, South Australia.

LOT FOURTEEN - Capability Statement

These technologies are of strategic importance; providing opportunities and significant benefits to grow Australia's economy and building sovereign capability.

Critical technologies also increase the state's economic complexity, furthering economic resiliency. At Lot Fourteen, capabilities reflect the state's key priorities.

Harnessing these technologies benefits the wellbeing of all South Australians by providing high-paying jobs, moving the state closer to a "smart, sustainable and inclusive" economy envisioned by South Australia's Economic Statement.

South Australia has existing research and industry strengths aligned to several key technologies critical to driving progress in some of our most important industries. At Lot Fourteen, Artificial Intelligence (AI), advanced information and communication technologies (including cyber) and quantum technologies are areas of strength and enablers for activity across the district's focus sectors (Defence, Space, Cyber and Creative Industries) and beyond.

State and National context

Critical technologies underpin almost all aspects of Australian industry and society. The importance of critical technologies for both society and economy has been recognised through the Australian Government's release of the Critical Technologies Statement (2023), which outlines the role of critical technologies in supporting economic prosperity and national security, sustainability, and social cohesion.

Following extensive public consultation, the Australian Government has developed the List of Critical Technologies in the National Interest grouped into the following fields:

- Advanced manufacturing and materials technologies
- AI technologies
- Advanced information and communication technologies
- Quantum technologies
- Autonomous systems, robotics, positioning, timing and sensing
- Biotechnologies
- Clean energy generation and storage technologies.

Many of these critical technologies also feature as advanced capabilities to be pursued under the AUKUS partnership.

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Value proposition

Lot Fourteen is a world-class innovation district that offers:

- Co-location with defence, space, cyber and creative industries clusters with a focus on enabling critical technologies
- Secure working environments, underpinned by a robust district security framework
- Close proximity to world-class education and training institutions
- Avenues for collaboration between industry and research organisations
- Accessible CBD location with state-of-the-art facilities
- A focus on sustainability and wellbeing as a certified 6-Star Green Star Community and WELL Community Standard district
- An emphasis on supporting First Nations people and culture.



Innovation Centre visualisation by Baukultur. Northern elevation. (September 2024)

Skills and education

Once complete, the district will provide fully integrated pathways through the education hierarchy in critical technologies, ensuring that Lot Fourteen is contributing to workforce development to address current and future industry/business needs.

An Australian defence technologies training facility at Lot Fourteen is currently under development which will drive sovereign defence capabilities in South Australia. The \$60 million Australian Defence Technologies Academy will be operated by the new Adelaide University. From 2026, the state-of-the-art facility will provide digital training, education and research capabilities (advanced technologies) critical to the defence industry, while aligning with other sectors including space and cyber.

Australian Institute for Machine Learning (AIML) is home to more than 70 postgraduate students engaged in both fundamental machine learning research, and industry-affiliated projects with leading multinational companies. Announced in May 2024, the South Australian Government through the Department of State Development, is investing a further \$6 million, matched by the University of Adelaide, into artificial intelligence (AI) research and development at AIML to expand its core work and make it more globally competitive.

This new funding will contribute to:

- supporting AIML's research and engineering team to help government and South Australian SMEs to develop AI-enabled products and services, automate processes and improve productivity

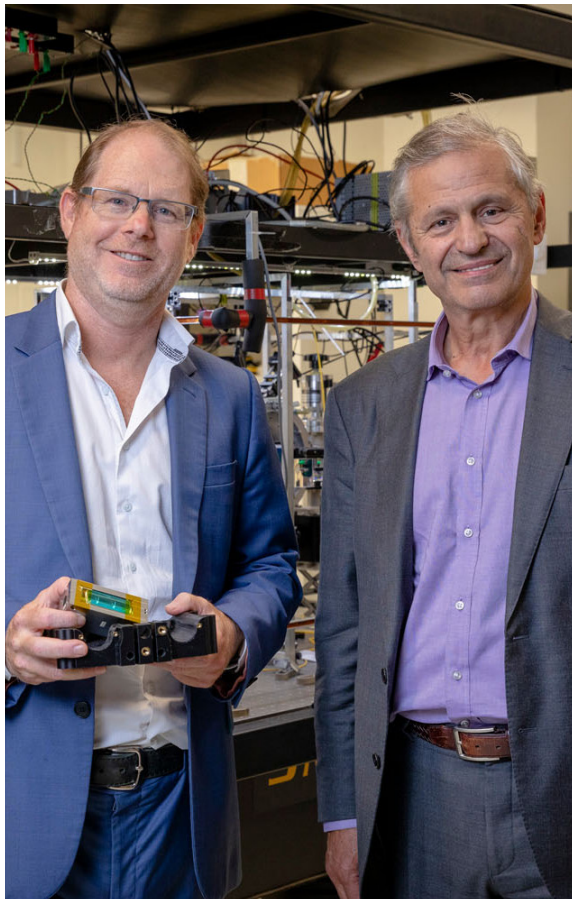
- establishing four international exchange PhD scholarships, prioritised to AUKUS partner universities, and 16 honours/masters degree scholarships to provide opportunities for South Australian students recruiting leadership and top artificial intelligence research talent into South Australia.

In addition, in December 2024, AIML, in partnership with the CSIRO, launched the Responsible AI Research Centre (RAIR Centre). The groundbreaking new research centre will focus on world-leading research that explores four key themes:

- **Tackling misinformation:** developing methods that enable attribution of trusted data sources to AI-generated content to avoid misinformation and misuse.
- **Safe AI in the Real World:** exploring the foundational science questions that underpin how AI interacts with the physical world, linking to areas including robotics.
- **Diverse AI:** developing AI systems that can accurately assess their own knowledge limitations and reliably express uncertainty, helping to reduce AI hallucinations.

AI that can explain its actions: developing AI that understands cause-and-effect relationships, beyond correlations, particularly in complex and dynamic environments.

The RAIR Centre will be based at Lot Fourteen and is expected to be fully operational in early 2025. An initial combined investment of \$20 million has been provided by the University of Adelaide, the CSIRO and the South Australian Government.



QuantX Labs Founder and Managing Director Andre Luiten (left) with SmartSat CRC CEO Professor Andy Koronios (right).

Future areas of growth

In an increasingly insecure world, critical technologies will be required to enhance Australia's sovereign industrial, economic, logistical, research and educational capabilities to achieve objectives including safety, defence, health and wellbeing, food security, energy and key materials supply, infrastructure security, and environmental sustainability.

Innovation districts, like Lot Fourteen, can be pivotal in supporting the global green transition, as powerhouses for innovation and commercialisation, fostering collaborative partnerships between government, research, and education institutions (including universities), and industry.

Lot Fourteen is well-positioned to support the delivery of information sharing commitments under AUKUS Pillar Two, such as advanced capabilities of AI and autonomy, cybersecurity, and quantum technologies.

The Innovation Centre, the next new build at the district, will set a global pace for the growth of defence, space, critical technologies and cyber industries. The Centre will be home to:

- \$60 million Australian Defence Technologies Academy
- \$20 million Innovation Hub
- \$20 million Space Assembly Integration and Testing facility
- BAE Systems Australia.

Partnerships and collaborations

Stone & Chalk-based AgTech start-up Cropify is combining agricultural experience with Artificial Intelligence and machine learning expertise to develop technology believed to improve the accuracy of the classification of pulses and grains and reduce conflict between sellers and buyers around quality, from paddock right through to the export and importing customers. Presently most grain assessment is done subjectively by eye, but with years of insight in the grain industry, the company identified the need to provide an objective, accurate, faster and repeatable means to assess grains. Their software – developed with the support of AIML – uses high-resolution imagery to assess an industry-standard sample of lentils in approximately 6 minutes compared with the current industry average for pulses of about 24 minutes. The Cropify technology can pick up defects in the lentils as well as identify weed seeds that could contaminate shipments. It also provides a solution to the current critical shortage of grain classifiers in regional areas. Cropify recently secured \$2 million in capital funding, enabling the company to focus on commercialising its innovative technology.

QuantX Labs is set to propel Australian quantum technology into space in 2025. Renowned for its ground-breaking work in quantum technology is poised to take quantum advancements to new heights through its KAIROS mission. This mission culminates in the launch into low Earth orbit and demonstration of a next-generation optical atomic clock, a project that promises to revolutionize space-based PNT (position, navigation and timing) capabilities. The optical atomic clock, which was initially developed at the Institute of Photonics and Advanced Sensing at the University of Adelaide and supported by funding from the SmartSat CRC, will now undergo crucial developments to become space-ready. This evolution will be propelled by the Australian Space Agency's Moon to Mars Demonstrator Program. Diversifying their technologies, QuantX Labs is also developing highly sensitive quantum sensors. This technology effectively makes the land and sea transparent, great for subterranean and undersea surveillance.

In September 2024, the University of Adelaide and Commonwealth Bank announced a landmark five-year partnership to establish the co-branded CommBank Centre for Foundational AI Research at Lot Fourteen. This collaboration embodies a shared vision between industry and academia, driving critical advancements in artificial intelligence (AI) that will elevate research and educational outputs at the University's Australian Institute for Machine Learning (AIML). This initiative was born from a CommBank investment in AI, the largest of any company in Australia. Early indications suggest that the \$6 million investment has already paid for itself.

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Specialisation at Lot Fourteen

Machine learning and artificial intelligence research and application

For many, 2023 was the year AI became 'real' with the public release of generative AI products, such as ChatGPT. With wide reaching implications, and integration and use across all sectors of society, AI offers equality and enhanced efficiency. AI is being used across a wide range of applications, from improving the classification of pulses and grains to enhancing fertility outcomes for prospective parents.

South Australia is becoming a global leader AI, and Lot Fourteen, through tenants such as AIML and Amazon Web Services (AWS) and is the centre of AI in the State. In 2021, AIML ranked second globally for computer vision research published over the period 2016 to 2021. It has continued to grow its AI capability, working collaboratively across industry sectors to develop AI-enabled products and services, automate processes and improve productivity.

For over 15 years, AWS has been the world's most comprehensive and broadly adopted cloud offering. Millions of customers trust AWS to power their infrastructure, become more agile, and lower costs. AWS teams at Lot Fourteen are undertaking world-leading AI and machine learning research, provide support and cloud enablement to local businesses and government agencies to assist with their digital transformation journeys and help local businesses to become more competitive on the global stage. The Amazon Science team conducts new research programs to improve the customer experience for Amazon.com customers.

Satellite Communications

Australia is reliant on space-based and space-enabled technologies to tackle the critical global challenges in healthcare, energy, environmental resources, mining, bushfires and national security. Lot Fourteen is the launch site for much of the sector's growth in Australia.

Saber Astronautics's state-of-the-art mission control centre is strategically located at Lot Fourteen with plans for expansion in the US and Asia.



The SmartSat Cooperative Research Centre, Australia's largest collaborative initiative in the space industry, affords us unparalleled opportunities for engagement with leading universities, esteemed global space enterprises, dynamic SMEs, and visionary startups.



Protective cyber security technologies

The advanced information and communication technologies critical technology field brings together telecommunications, computers and software, allowing for greater speed and volume in processing and transferring data. It also includes protective cyber security. South Australia has strong capability in advanced communications and technologies, boasting a wide array of companies and research institutes. The Australian Cyber Collaboration Centre, based at Lot Fourteen, is a not-for-profit organisation committed to 'using knowledge and expertise to make cyberspace a better, and safer, place for organisations, corporations, agencies and institutions to do business – now and into the future.'

Quantum Technologies

While quantum technology is still an emerging field, Australia has been a significant contributor to, and a leader in, early quantum research. Quantum technologies leverage a branch of quantum physics to build advanced technologies that would otherwise be impossible.

QuantX at Lot Fourteen is a world leader in high-precision timing and quantum sensor technologies. In September 2024, Quantx Labs signed two contracts with the Department of Defence for the sale of its state-of-the-art optical atomic clocks.

Key critical technologies tenants



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