Artificial intelligence (AI) algorithms are computer algorithms that perform tasks normally requiring human intelligence. AI hardware accelerators are computer hardware optimised and purpose built to run algorithms faster, more precisely or using less energy than is possible using non-optimised general purpose computer hardware.

Key Sectors

Influences all sectors of the economy, including:
- Agriculture
- Banking & Finance
- Communications
- Defence & Defence Industry
- Energy & Environment
- Health
- Transport & Logistics
- Education & Research
- Mining & Resources
- Manufacturing
- Space

Australia’s place in the world

Australia ranks 15th globally for research impact, led by the University of Melbourne. The United States has the highest research impact for artificial intelligence, with seven of the top 10 performing research institutions, 4 of which are private companies. The United States has significantly higher amounts of venture capital (VC) investment compared to second ranked China. Australia is unranked, globally, for VC investment. Patent activity has been increasing at around 14% p.a. since 2016, with near equal global leaders China and the United States both holding approximately 100 times more patent families than Australia, which ranks 21st worldwide.

Artificial intelligence is being advanced in multiple Australian industry sectors, particularly in banking & finance, transport & logistics, communications and health. Australia is currently world leading on the development and deployment of AI Ethics Principles and has piloted these principles with 6 companies. Australia is a member of the Global Partnership on Artificial Intelligence (GPAI) and the AU-KUS (Australia, United Kingdom, United States) alliance has an emphasis on AI collaboration.

Opportunities and Risks

Artificial intelligence (AI) holds great promise for Australia’s economy, security and society, from improved productivity through increased automation, enhanced cyber security, and increased worker productivity and fulfilment by allowing workers to focus on more creative or high value-add tasks. Building AI capability in Australia will help elevate Australia to a world-leading digital economy, and raise our position in the development and adoption of AI. AI capability also ensures we are able to counter national security threats, and increase our defence capabilities, through smarter military systems and operations.

With the opportunities AI promises, there are also significant risks. AI developed from poorly written or applied algorithms and biases can result in faulty decision-making that could harm people, machinery or critical infrastructure. Furthermore, poorly implemented algorithms can give rise to security issues.

AI can also be used to mount malicious cyber-attacks or spread AI-generated synthetic media (deepfakes) and misleading information at unprecedented scale. Vulnerabilities in AI-based systems can also be exploited to undermine public confidence in AI-based tools and services. Australia is working with international like-minded partners to mitigate these risks.
The United States has the highest research impact in this area, with Australia ranked 15th globally. Total volume of published research has increased at around 15% p.a., over the 5 year period 2016–2020, with 19% of research involving international collaboration.

Australia is unranked for relative venture capital (VC) investment in this area, while the United States has the highest amount of investment in this area. Investment in this area has been growing at 16% p.a. since 2016.

The number of patents filed annually in this field has increased by 36% from 2015 to 2019. Most patents in this field were filed by applicants or inventors from China and the United States. Australia ranks 21st.

Research Impact provides an indication of the productivity of a country or institution. Here, productivity was assumed to be represented by the volume of publications (i.e. scholarly output) as an indicator of the resources & facilities, and the level of interest in the publications as an indicator of quality.

Data from Crunchbase. The Crunchbase database provides a partial view of the global VC landscape. However the quantity, quality and richness of the data are considered to be statistically significant, and indicative of global trends.

Rank Top International Institution Research Impact
1 Nvidia | United States 846
2 Tsinghua University | China 776
3 Hewlett-Packard | United States 764
4 Massachusetts Institute of Technology | United States 587
5 University of California at Santa Barbara | United States 519
6 Chinese Academy of Sciences | China 458
7 IBM | United States 457
8 Intel | United States 421
9 Huazhong University of Science and Technology | China 245
10 Stanford University | United States 233

Rank Top Australian Institution Research Impact
1 University of Melbourne 25
2 Queensland University of Technology 17
3 University of Sydney 12
4 Monash University 10
5 University of Technology Sydney 9
6 University of Adelaide 7
7 Southern Cross University 3
8 University of Queensland 2
9 Macquarie University 2
10 Deakin University 1

Top 5 Australian Patent Applicants Patent Families
1 Ocean Logic 2
2 University of Sydney 1
3 n/a (private citizen applicants only) 1
4 Commonwealth of Australia 1
5 n/a (private citizen applicants only) 1