



We acknowledge this land that we meet on today is the traditional lands of the Kaurna people and that we respect their spiritual relationship with their country.

We also acknowledge the Kaurna people as the custodians of the Adelaide region and that their cultural and heritage beliefs are still important to the living Kaurna people today.

Program

09:30	Welcome and Acknowledgement of Country
	Hon. Michael Brown – Asst. Minister Artificial Intelligence, Digital Economy, Defence & Space Industries
	Professor Göran Roos - Globally recognised expert in innovation management and digital transformation
10:45	MORNING TEA
	Dr. Penny Stewart - Founder and CEO of PETRA Data Science
Professor	Laura Parry - Pro Vice Chancellor Research Performance, Adelaide University
	Professor Markus Stumptner - Director Industrial AI Research Centre
12:15	LUNCH
13:00	Panel Discussion – Further explore the opportunities and challenges of adopting Al
	Dr. Michelle Perugini - Head of Commercialisation UniSA, CEO UniSA Ventures, Board Chair Qubigen
	Industrial AI Research Centre - How to engage
14:45	Thank you and event close

Please stay and enjoy the networking session

Hon. Michael Brown

Assistant Minister to the Premier for

Artificial Intelligence, Digital Economy, Defence and Space Industries



Professor Göran Roos

Global expert in industry policy, strategy, innovation management and digital transformation

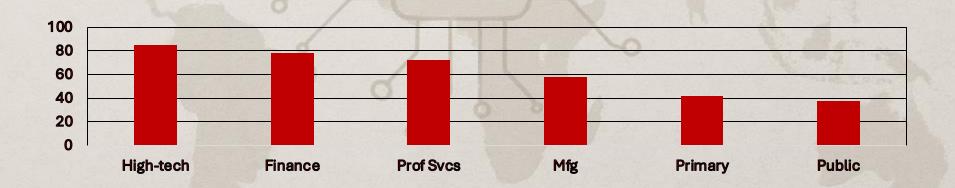


Artificial Intelligence, Productivity, and Policy Readiness A Global and Australian Perspective Göran Roos – October 2025

Global Al Adoption Is Broad but Uneven

By late 2024, approximately 72% of global enterprises reported using Al in at least one business function—up from 55% in 2022. Adoption has become near-universal in high-tech, finance, and professional services but remains lower in primary industries and the public sector.

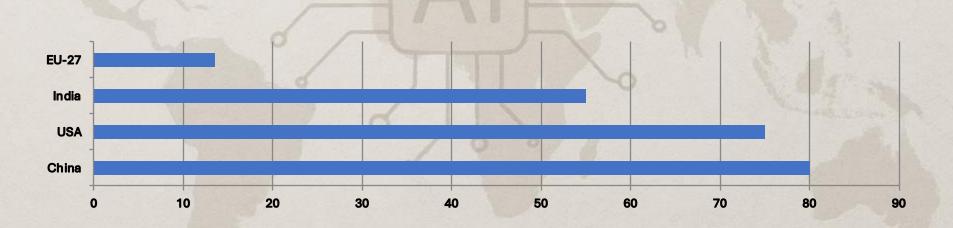
Gen-Al integration has expanded rapidly: 65-71% of organisations now use large-language-model-based tools in operations, product development, or customer service, though sustained value creation remains concentrated among early-mover firms.



Regional Adoption Patterns and Data Caveats

Reported adoption levels differ significantly by methodology. Surveys show the United States ~75%, China ~80%, India ~55%, and Europe ~13.5% (EU-27) using AI technologies in business operations.

However, these figures mix differing metrics—public sentiment, enterprise deployment, and consumer use—and are not directly comparable. Europe lower percentage reflects stricter definitions within Eurostat official methodology.



Australia Al Adoption Trajectory

According to the Australian Government Al Adoption Tracker (2024), around 40% of SMEs reported active Al use, with rates substantially higher in professional and scientific services and lower in agriculture and construction.

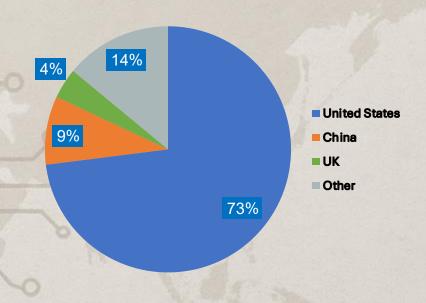


Public sentiment: 68% of Australians expect AI to benefit science (CSIRO 2024)

Private Investment Concentration Persists

Private investment in AI exceeded US \$109 billion in 2024, dominated by the United States (73%), followed by China (~9%) and the United Kingdom (~4%).

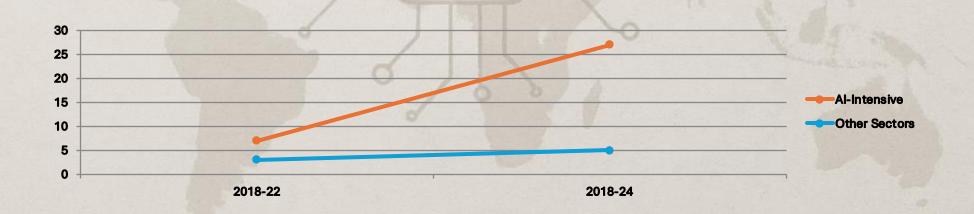
This concentration reflects the enduring dominance of a few major technology ecosystems, while smaller economies depend heavily on imported models. Despite this asymmetry, targeted public programs are expanding domestic capability.



Emerging Productivity Gains Are Concentrated

Al-intensive sectors recorded productivity growth rising from 7% (2018–22) to 27% (2018–24), alongside an average 56% wage premium for Al-skilled roles.

However, these gains are heavily concentrated in advanced economies and high-skill occupations. Without complementary investment in digital infrastructure, workforce development, and data quality, diffusion will remain limited.



Why Most Al Pilots Still Fail

A recent MIT NANDA study (2025) found that 95% of generative-Al pilots failed to meet revenue goals, largely due to inadequate data readiness.

Purchased AI tools achieved a 67% success rate, compared with 33% for internally built solutions. Successful adoption requires integration of domain expertise, process reengineering, and human oversight.



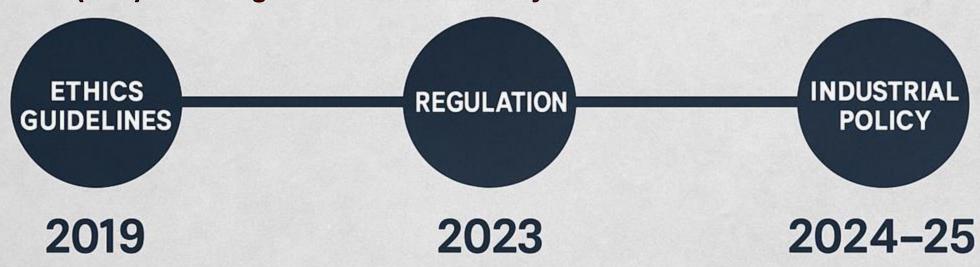
Employment Transformation, Not Simple Displacement

Al adoption is automating routine cognitive tasks while amplifying demand for roles in data governance, model operations, and human-machine interface design.

PwC (2025) projects net positive employment effects in Al-augmented occupations but rising inequality between firms able to integrate Al effectively and those unable to do so.

From Ethical Frameworks to Industrial Policy

Governments are shifting from principle-based AI ethics frameworks toward targeted industrial policy instruments. The EU AI Act and U.S. Executive Order (2023) establish guardrails for model safety.



Australia 2024 Al Action Plan Update aligns with this trend, emphasising responsible Al, sovereign capability, and SME adoption support.

Building Human Capital for Applied Al

Integrating AI-enabled process optimisation within industry can strengthen both productivity and emissions performance.

Higher Degree by Research

Industry Placements



Capability
Uplift

Productivity Improvement

Al as an Enabler of Energy-System Efficiency

Al systems are increasingly deployed for grid optimisation, predictive asset maintenance, and dynamic market bidding. Integrating edge-Al devices with 5G networks enhances real-time control.

Policy should focus on improving compute-efficiency benchmarks and mandating lifecycle energy reporting for large-model deployments.

Addressing Persistent Systemic Barriers

Key constraints continue to limit diffusion of AI and advanced-manufacturing technologies in Australia: fragmented data governance; insufficient digital infrastructure in regional areas; and limited access to venture-scale finance.

Energy

Skills

Policy coherence across federal and state levels remains incomplete.

Finance

Toward Integrated Technology and Industrial Policy

Al adoption and energy-transition policy are increasingly interdependent. Nations leading in industrial Al are also those investing in resilient supply chains and sustainable carbon-free energy systems.

For South Australia, a coordinated approach that couples renewable-energy leadership with applied-AI research can yield both productivity gains and emissions reductions.

In addition, productivity enhancing applications should be identified in the other core domains for the state

AURICULIURE

Policy Imperatives for the Next Decade

Australia possesses the scientific capacity and natural-resource endowment to be a net beneficiary of the Al-enabled green-industrial transition, but success will depend on execution.

Priority Actions:

- Embedding Al-efficiency and lifecycle-energy standards across industries
- Strengthening translational mechanisms (CRCs, Catapult-style centres)
- Expanding data-infrastructure access for SMEs and regional industries
- Aligning critical-minerals, energy, and digital-capability strategies

INDUSTRY

RESEARCH





Dr. Penny Stewart

Engineer, Founder & CEO of Petra Data Science



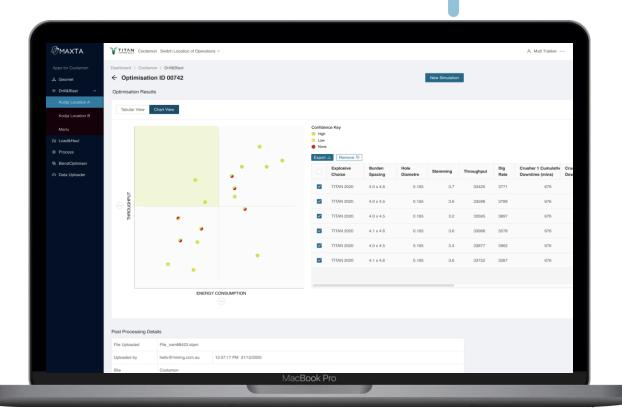


Introducing PETRA

PETRA Data Science Pty Ltd is an industrial AI software company that I founded in 2015.

- Our software products are powered by PETRA's proprietary digital twin technology stack: Data Fusion Ore Tracking & Machine Learning.
- We deliver enterprise grade software and user experience as a platform one platform supports global operations and all MAXTA applications including ISO 27001 certified data uploader.





Digital Twin Modelling

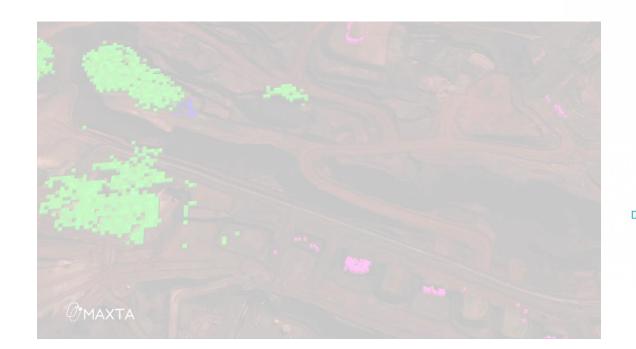


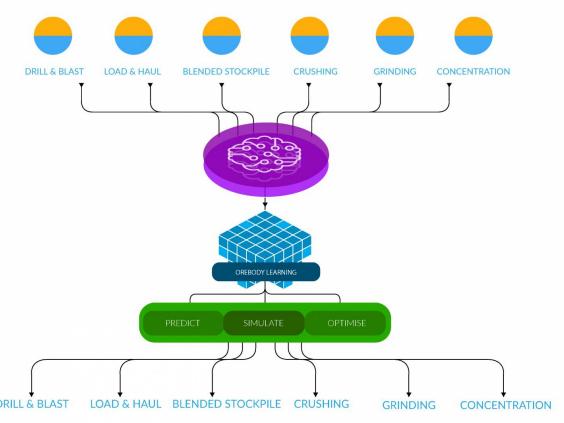
Data Fusion Ore Tracking enables digital twin modelling across the mine value chain.

ORE TRACKING DATA

Enables mines to optimise mine value chain with Al

- PETRA's data fusion ore tracking IP enables geological data to be merged with production data across the mine value chain from load and haul through to processing plant recovery/yield.
- PETRA's software creates new orebody knowledge for high accuracy mine planning and optimization.





Our Values

Customer success through trusted industry and academic partnerships

- Customer success through productivity and efficiency gains
- No offshore product development protects IP and investment in team social capital results in first to market results.
- Trusted AI brand quality results and data security
- Financial and in-kind support for PhD and Postdoc research
- Research and teaching collaborations





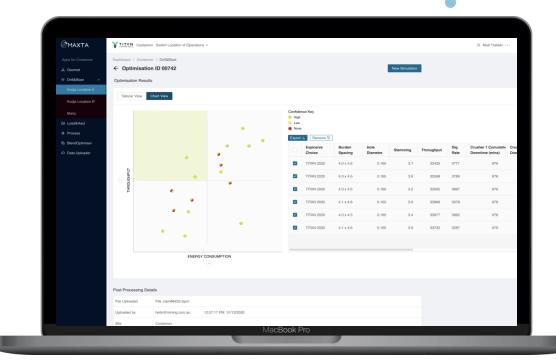


Sponsored by the Minerals Council of Australia, PETRA contributes valuable course content via the edX platform -Digital Transformation of Mining (MINE5X)

https://www.edx.org/learn/digitaltransformation/curtin-universitydigital-transformation-of-mining



PETRA is collaborating with the University of Adelaide as an industry partner for the Australian Research Council Training Centre for Integrated Operations for Complex Resources. As an industry partner



Al Mine Optimisation Case Study

Industry Challenges:

Shortage of engineers - New drill&blast engineers lack mentors when start new role.

Explosive manufacturer technical advice biased to high-cost product with insufficient evidence.

Accuracy issues with empirical models that are dependent on spatially poorly sample geological rock specimens.





Iron Ore Operations Case Study June 2019 - 2025

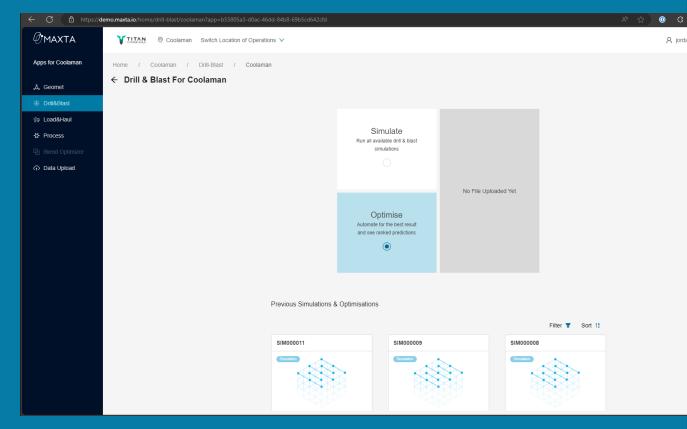


Al Mine Optimisation Case Study

Solution

- 1. Model accuracy provided to engineers, cybersecure ISO 27001 certification, reliability and sustainability (maintenance and support)
- 2. Engineer can choose different levels of automation i.e. simulation and optimisation (semi-automation).
- 3. Engineer can see geology and predictions spatially to ease validation and increase explainability.









Customer Success Story

Increase accuracy of geotechnical inputs for mine project study team.

Underground Mine South Australia



Problem

Rock strength and density tests for an Underground Mine in South Australia were inaccurate with **deviations of 20-50%**. The cost of testing limited the ability to capture the geological variability.

Mining and geotechnical engineers involved in studies required reliable estimates of rock prop erties for; mine design, ground support design, numerical modelling and fragmentation modelling. Each of these studies required reliable estimates of the mechanical rock properties including:

- -Rock strength e.g. Uniaxial compressive strength (UCS)
- -Modulus of elasticity e.g. Young's modulus (E)
- -Density



Solution

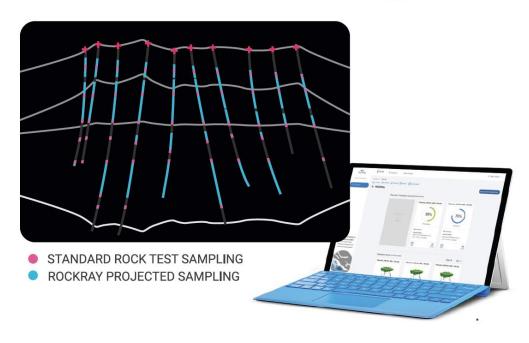
- Data fusion enables machine learning algorithms to make predictions using all available drillhole data.
- Together, available rock tests and drillhole data are used to project/infill rock properties along the remainder of the drill hole using machine learning, saving time and cost associated with typical sampling and laboratory testing programs.

34

Results

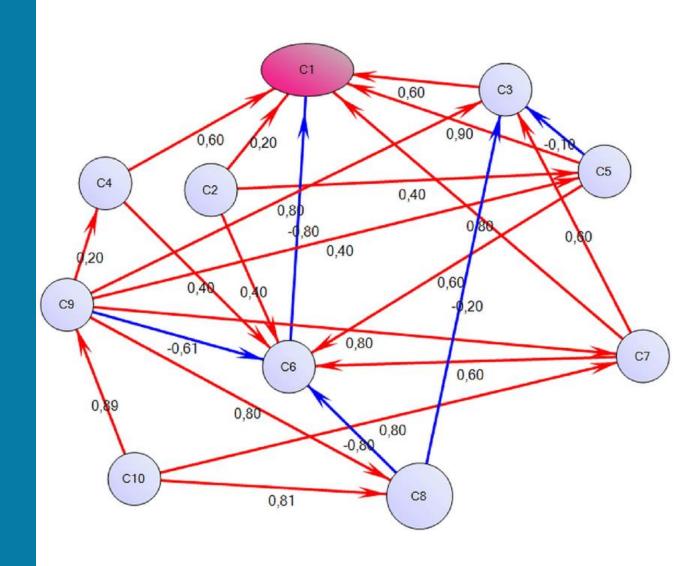
190 fold increase

in length of core with rock strength whilst simultaneously achieving a 20-40% increase in accuracy compared to domain average

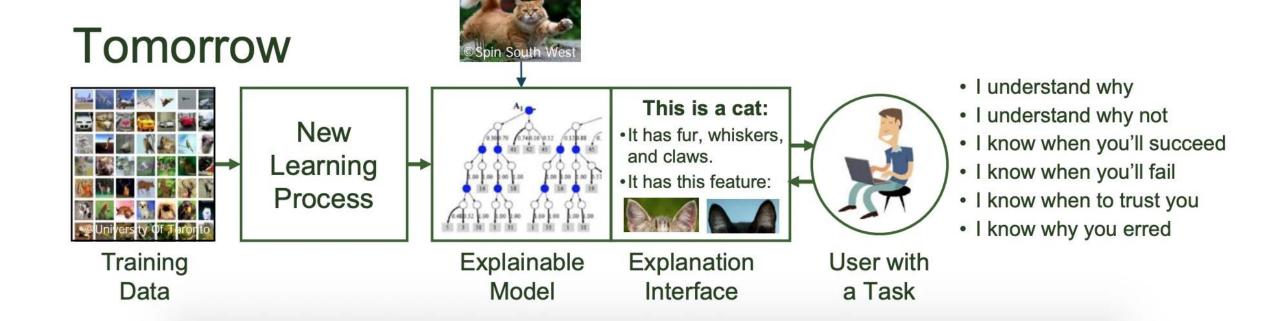


What's next? Explainable Causal Al

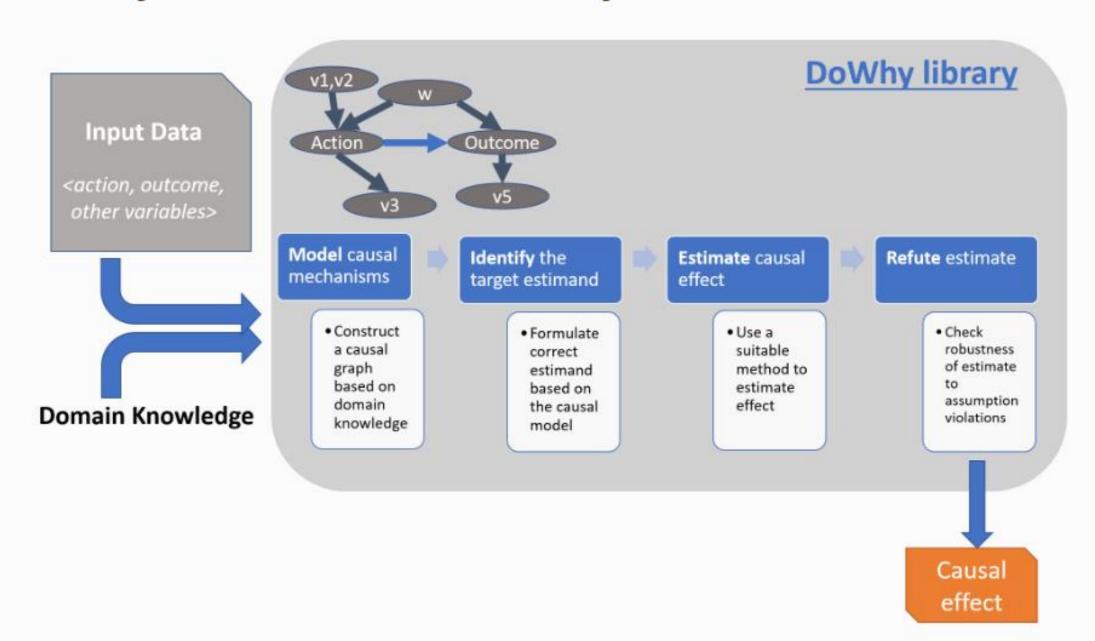
Fuzzy Cognitive Maps combines human input with mathematical learning algorithms



Today Why did you do that? Why not something else? · When do you succeed? Learning This is a cat (p = .93) When do you fail? **Process** • When can I trust you? How do I correct an error? Output **Training** User with Learned **Function** a Task Data



DoWhy | An end-to-end library for causal inference



Domain knowledge and Investment in Social Capital

2015 Data visualisation

2020 Customer research and workshops led UX design.

2025 Digital Twin Data visualisation





2016 Case Study - Data visualisation

• <u>Telfer Mine to Mill Optimisation 2016</u> Impact of Powder factor, UCS and rock type on SAG Mill Throughput & Dig-rate

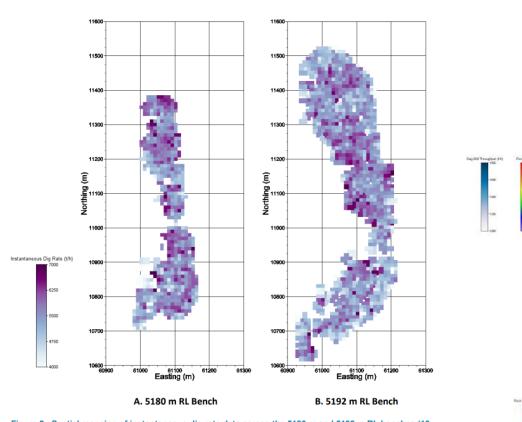


Figure 2 - Spatial mapping of instantaneous dig rate data across the 5180 m and 5192 m RL benches (10 m x 10 m voxel plot – 10 m search radius)

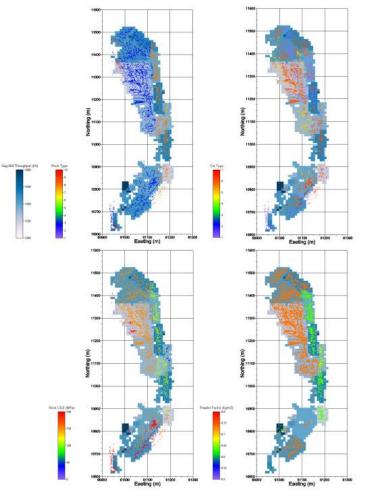


Figure 10 - Sag mill throughput versus rock UCS, blast powder factor, and ore type (5192 m RL bench)

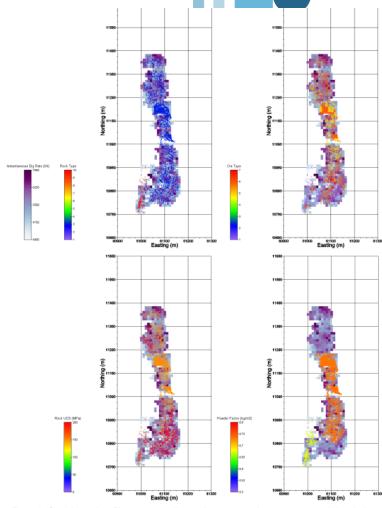


Figure 3 - Spatial mapping of instantaneous dig rate data versus rock type, ore type, and blast design powder factor across the 5180 m RL bench

2019-2025 Case Studies

Customer success through trusted industry and academic partnerships

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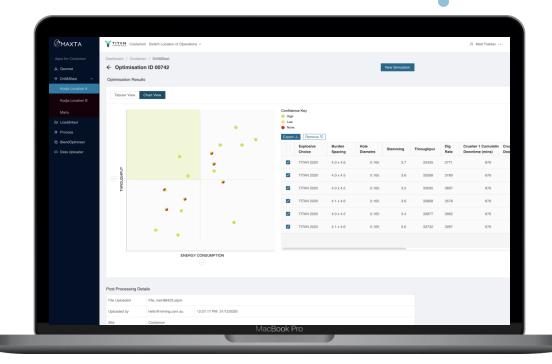


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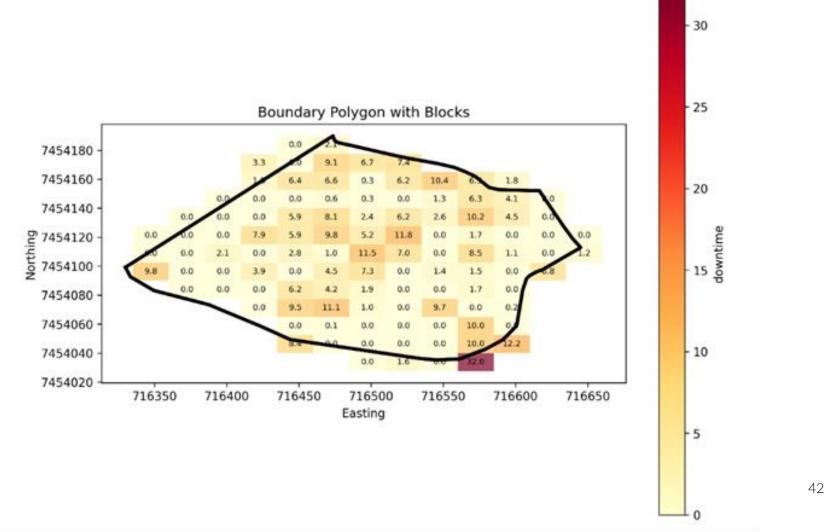
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2025 Digital Twin Data Visualisation







PETRA

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E: <u>info@petradatascience.com</u>

Level 1 Toowong Village, Queensland



Adelaide University

Professor Laura Parry - Pro Vice Chancellor Research Performance



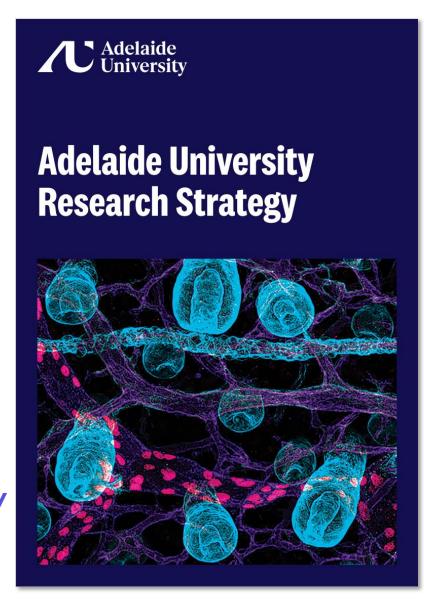


Our Research Strategy

Our vision for research is to be Australia's premier for-purpose research university, delivering outstanding locally-embedded, globally relevant research having impact.

adelaideuni.edu.au/research/our-research/





Our Research Ambitions



to be globally recognised as Australia's leading for-purpose research university



to be the research partner of choice and Australia's most industryengaged university



to be the destination of choice for the best global researchers, innovators, thinkers, and entrepreneurs in our priority areas



to be Australia's most connected university, partnering with the communities we serve and an engine for innovation, productivity and growth



Our Research Strategy priorities:

Research Excellence & Impact

Conducting research across the entire value chains, founded on excellence, with a clear focus on **real-world impact**, and guided by five signature research themes (SRTs)

Align research efforts with state, national, and global priorities

Research Talent

Growing a diverse, agile, and inclusive research talent ecosystem that **empowers success** and supports multidisciplinary collaboration aligned with key priorities

Attract, develop and retain top research talent

Research Training & Development

Delivering **nation- leading research training** and grow the pipeline of graduate researchers from a wide range of backgrounds

Enhance research training pathways by offering flexible, contemporary programs

Engaged Research Translation

Leading in engaged research translation through a differentiated approach to alliances with industry and community that deliver real solutions and impact

Pursue industry and community alliances to enable mutual knowledge exchange and real-world application

Honouring Diverse Ways of Knowing

Ensuring meaningful,
two-way collaboration
through **genuine cultural engagement**with Aboriginal Torres
Strait Islander ways of
knowing, being and doing

Cultivate a culture that respects the knowledges, values, and perspectives of all disciplines and paradigms



Strategic enablers

Institutional capabilities support our research efforts:

Lived Experience Partner Program

Reward & recognition systems

Research training & pathways

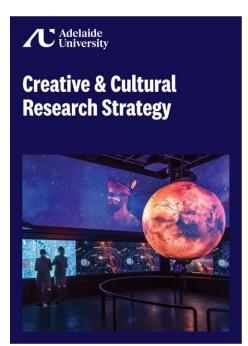
Research translation & commercialisation

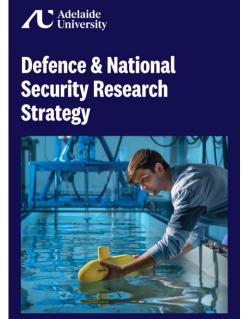
Showcasing research excellence

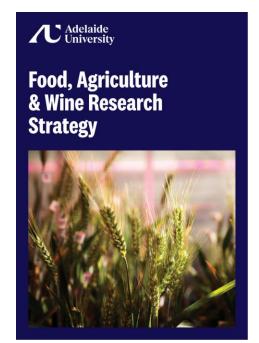


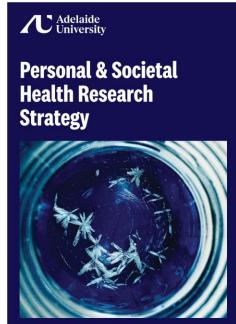
Our Signature Research Themes

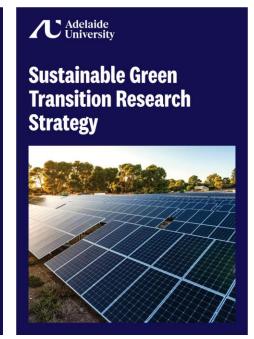
We will conduct multidisciplinary research of the highest global standing, focused through Signature Research Themes that will define South Australia as a test-bed for innovation, connected by an Aboriginal and Torres Strait Islander Research Strategy.











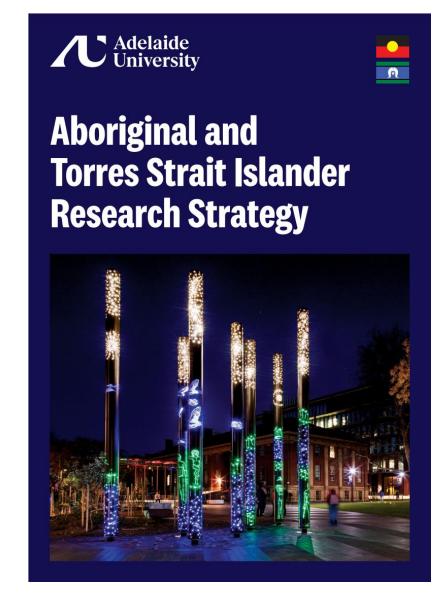


Aboriginal & Torres Strait Islander

The Aboriginal and Torres Strait Islander Research Strategy enables a vibrant, inclusive and responsive research environment. Adelaide University recognises Aboriginal and Torres Strait Islander Peoples and Communities as knowers, thinkers, and innovators in the creation of knowledge and discovery.

Our Pillars of Research Focus:

- 1. Recognition and celebration
- 2. Self-determination
- 3. Decolonisation
- 4. Accountability
- 5. Equity and intersectionality





adelaideuni.edu.au/research/our-research/









adelaideuni.edu.au

Professor Markus Stumptner

Director, Industrial Al Research Centre



Industrial AI at a Glance

- Established in 2018
- 25+ Academics (16 Prof & A/Prof) + 20 project staff
- Computing, Mathematics/Statistics, Engineering
- 50+ PhD Students
- \$4 Million Research Income (in 2024)
- 80% of research income is Industry partnered

























Our Expertise...

- Machine Learning and Al
- Natural Language Processing, Data Processing, and Fusion
- Causal Inference and Trustworthy AI
- Interoperable Software and Digital Twins (Industry 4.0)
- Pattern Recognition and Anomaly Detection
- Process Modelling/Mining and Predictive Forecasting
- Optimal Control and Dynamic Resource Optimisation
- Autonomous and Goal-Driven Systems
- Data Visualisation and Enhanced Decision Support Systems
- Software Architectures & solutions in partner environments



... Applied in and with Industry



Space Systems





Defence





Environment, Forestry & **Agriculture**



Manufacturing & Construction



Transport



Energy, Resources & Renewables



Autonomous and Sensor Systems





















Transport

- Optimisation and optimal control
- UAV Traffic Management: Drone fairness monitoring

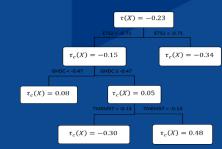
Energy, Resources, Renewables

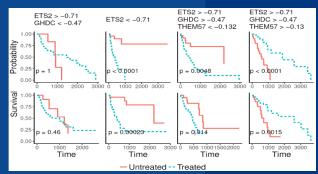
- Renewable Energy systems and networks (Australian Energy Market Operator)
- Household and commercial energy optimisation
- Solar output forecasting

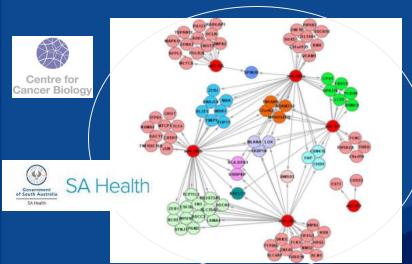


Health

- Digital Health Innovation and Clinical Informatics (DHICI) Lab
 - Predicting adverse events in clinical settings
 - Understanding clinical patient flow
- Digital self-management of young people with Asthma
- Gene regulatory networks discovery
- Cancer subtype discovery
- Adverse drug reaction detection
- Predicting the onset of seizures
- Injury prediction (AFL)
- Mental well-being and coping interventions



















Environment & Agriculture

- Crop irrigation decision support
- Wine industry overview/trends analysis
- Water composition analysis (taste satisfaction)
- Community exposure to lead-in-air (Port Pirie, Nyrstar smelter)
- Low carbon living
- Early fire detection using satellite images
- Local council projects (cat tracker)

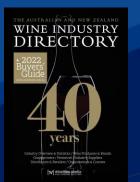














Process Industry

- Australian Open Industrial Interoperability Ecosystem (OIIE™) Laboratory
 - Future Energy Exports CRC Digital Technologies & Interoperability Program
 - lot Water Hub Data Management & Standards Theme
- Risk Management
- Predictive Maintenance

Manufacturing

- Information collection and extraction
- Bridging data silos
- Digital Twins
- Defect detection
- Automated (Re-)Configuration
- Predictive Maintenance



Space Systems and Autonomy

- Al-based multi-spacecraft systems
- Onboard ML/RL/AI sensing/perception, cognition/reasoning/planning, DM/actioning
- Goal-oriented spacecraft autonomy, selfconsciousness & situation-awareness
- Distributed hybrid space systems-of-systems autonomy, resilience & optimisation
- Trusted space & edge systems autonomy
- Mission-as-a-Service: virtual constellations & space clouds for agile satellite services
- Autonomous Systems and sensing
- Resilient navigation, drone swarms
- Remote Sensing of life signs
- Disease detecting drones
- Human-Al Interaction





Partners

Energy/
Resources

SA Power Networks

INPEX

AEMO

ARENA

IEA

ANSTO

NREL

NERA

Australian PV Institute

Process Industries/
Manufacturing/
Construction

REDARC INPEX

Hansen Juncken

Solinnov

FREQUENTIS

Technology

MIMOSA Secora Assetricity Synengco Health

SA Health

WCH

RAH

SA Pathology

SAHMRI

Centre for

Cancer Biology

Environment

SA Water Local Councils

EPA

Defence/

National Security

DST Group

Saab

BAE Systems

Lockheed Martin Australia

Raytheon Anschütz

Minelab

Silentium

Aurizn

Acacia Systems

DAIRNet

CIA

AFP

Attorney General's Dept.



Industrial Al Research Centre



Panel Discussion

Further explore the opportunities and challenges of adopting AI with...

- Dr Penny Stewart
- Professor Belinda Chiera
- Estha van der Linden
- Craig Hosking

Moderator – Dino Rossi

Q&A





R & D Tax Incentives

Dr. Michelle Perugini - Head of Commercialisation UniSA, CEO UniSA Ventures, Board Chair Qubigen



Partnering for Innovation

Driving Industry & Research Collaboration through incentives

Dr Michelle Perugini

Head of Commercialisation UniSA, CEO UniSA Ventures



Where are we now?

One

of the strongest research ecosystems globally

9%

Of the world's top 100 universities come from Australia

And yet....

Ranked 22

For R&D spend out of the 38 OECD countries

Ranked 29 & 30

For university-industry collaboration out of the 38 OECD countries



Why isn't Aussie Industry Engaging More in R&D?

Businesses find Australia's R&D system is extremely difficult to navigate due to its complexity and bureaucracy

A disjointed funding system has contributed to government underfunding.

The R&D system requires some reform to drive change

SERD Review is addressing this

Department of Industry, Science and Resources, 'Submission to the Strategic Examination of Research and Development Discussion Paper' Adelaide University, April 2025





- We are translation partners
- We provide the access and the know-how
- We are embedded in the innovation ecosystem
- We strive to be the engine room for SA growth.

- 47% of R&D workforce is in HE
- We speak two languages: industry and research.





As a University, we are here to bridge the gap between industry and research.



Industry-University Funding Opportunities

#	Program	Level	Туре	Typical Value	Best For
1	R&D Tax Incentive	Federal	Tax Offset	38.5–43.5%	All businesses doing R&D with universities
2	CRC / CRC-P	Federal	Grant (Consortia)	\$3M – \$50M+	Strategic, multi-party research translation
3	ARC Linkage	Federal	Grant (Matched)	\$50k-\$300k p.a.	Longer-term strategic partnerships
4	AEA (Australian Economic Accelerator)	Federal	Grant (Proof → Market)	\$500k – \$5M	Commercialising university research with industry
4.1	RIF	SA	Co-investment	Varies	Industry–research projects in SA priority areas
4.2	Seed-Start	SA	Matched Grant	Up to \$500k	Startups commercialising tech with research partners
4.3	SA R&D Voucher Scheme	SA	Matched Grant	Up to \$100k	SMEs engaging universities on applied R&D
4.4	SA CRC Assistance	SA	Co-funding	Varies	CRC consortia with SA industry nodes

A case study: Life Whisperer





A case study: Life Whisperer

Founded in 2017 to make IVF more accessible and successful.

Supports **enhanced clinician decision-making**; the platform identifies embryos with higher chances of success as the **AI is trained on large, diverse and global datasets**

Life Whisperer is now used in IVF clinics across more than 40 countries.

Studies demonstrate a 12–15% **improvement in embryo selection accuracy** compared to standard morphology methods.

Federated learning allowed the AI to be trained collaboratively across multiple clinics without transferring patient data.



A case study: Life Whisperer

A University collaboration success story

Australia has capacity to translate research into impactful health technologies

- Critical, early funding via the
 R&D Tax Incentive (and others);
 bridging the "valley of death"
- Engaged with University-based
 startup growth programs

- Access to University researchers for prototype testing and validation
- Ensured alignment with commercial pathways and regulatory needs through research co-design





The new research translation agenda

 A 3% of GDP investment target for R&D

- A single national agency for R&D strategy
- Simplified & expanded incentives Impact focus

 Broaden academic career paths & eligibility criteria The R&D system will change by determining, improving and effectively leveraging key drivers.





Enterprise Hub

Why partner with us

- Expertise: Benefit from our team's deep knowledge in systems and technology.
- Cutting-Edge Solutions: Access state-of-the-art research and innovative solutions.
- Experience: Demonstrated record in jointly developing projects and delivering outcomes
- **Collaborative Approach:** Solutions for the industry partner, innovation outcomes for the academics
- Impactful Insights: Leverage our AI-driven data analytics to gain valuable insights from data.



Engagement options

- We offer a range of industry engagement and partnership options designed to help your organisation stay ahead of the competition and harness the power of AI.
 - Consultancy
 - Contract research
 - Collaborative research
 - Strategic partnerships
 - Sponsorship and support
- Join us in shaping the future. Discover the myriad opportunities to engage with us and unlock the transformative potential of AI. Together, we can drive change, shape industries, and build an AI-designed and more connected world.



Funding and Leverage

- Centre Academics will help in
 - Exploring requirements and defining projects
 - Identifying funding opportunities
 - Project leadership
- Project types

	Rounds/yr	Lengt	:h	Co-Investn	nent	Tradeoffs
Student projects	2 4-8 mg	onths	0	Experie		nce
PhD students	ongoing 3-4 years		<\$40K	<\$40K/yr Lead tir		ne
ARC Linkage	2	2-3 ye	ears	\$20K+		Competitive
CRC-P	2	2-3 years		\$50K+		Competitive, SMEs
CRCs	topical	negotiable		\$50K+		Comp.+Commitment
Other schemes						



Why partner with us

Expertise: Benefit from our team's deep knowledge and experience in systems and technology.

Cutting-Edge Solutions: Access state-of-the-art research and innovative solutions.

Collaborative Approach: Collaborate as part of our dynamic ecosystem. By joining forces with the Industrial AI Research Centre, you'll forge partnerships that drive advancements in technology.

Impactful Insights: Leverage our Al-driven data analytics to gain valuable insights from data.

Pioneering Spirit: Partner with a team dedicated to pushing the boundaries of innovation and exploration and expanding our understanding of the universe.

Industrial Al Research Centre

Thank You

connect with us

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