



Reimagining AI for People, Places & Planet

Bringing together educators,
designers, technologists and
policymakers

TD Research



Introduction

AI is transforming how we learn, work, govern and make decisions. Yet the most important questions are often no longer technical - they are human. At TD Research, we bring together expertise from across disciplines to help organisations and communities navigate the opportunities, risks and consequences of AI in the real world.

We explore both the possibilities AI unlocks and the challenges it creates. From more inclusive learning and smarter public services, to questions of trust, transparency and environmental impact - our work ensures AI is not only effective, but responsible, equitable and grounded in real-world contexts.

Spanning learning, governance, design, industry innovation and environmental systems, our research brings together diverse expertise to shape AI that strengthens society - while critically examining how it transforms it.



Overview

Unlike traditional AI research focused on optimisation and performance, we examine how AI interacts with people, institutions and environments. Our work combines design, systems thinking, education, policy and data science to help shape technologies that deliver meaningful public value.

Our researchers shape AI systems that are ethical, human-centred and context-aware—advancing capabilities in learning, governance, interaction design and environmental resilience. We also examine how these systems reshape institutions, environments and everyday life.

From strengthening trust to improving decision-making and enabling climate-ready futures, our work bridges technical insight and societal impact - turning AI's potential into practical, equitable outcomes for the public good.

We frame our research through critical, future-focused questions such as:

- What if AI were designed first for humanity — not just for efficiency?
- How might we build AI that communities can trust, understand and shape?
- What does responsible, ethical, future-ready AI look like in practice — not just theory?
- How are AI infrastructures shaping communities and environments?
- How can AI help us tackle the challenges that matter most to society?

“Our research team doesn’t just examine the implications of AI — they actively shape how institutions, industries and communities design, govern and live with emerging technologies.”

Fanny Salignac
Director, TD Research
Transdisciplinary School



Shaping and Understanding AI

We organise our work across four interconnected areas—from education and governance through to human-AI interaction and environmental resilience. Together, they allow us to examine both what AI can do and what it means for society.

Pillar 1

AI in Learning, Education & Human Development.

Pillar 2

AI Governance, Policy & Sociotechnical Systems.

Pillar 3

Human-AI Interaction, Data Methods & Decision Support.

Pillar 4

AI for Environment, Resilience & Societal Wellbeing.



Our AI Pillars

Key researchers in this pillar include – Antonette Shibani, Simon Knight, Sean Walsh, Julien Marchand, Helena Robinson, Luis Lozano Paredes and Dean Hargreaves.

Pillar 1

AI in Learning, Education & Human Development

We equip learners and educators to build the skills, tools and frameworks needed to engage with AI confidently, ethically, and creatively-while fostering critical understanding of its role in shaping knowledge and learning.

In practice, this includes work such as:

- GenAI literacy programs and self-paced modules for students and staff, co-designed through Students-as-Partners initiatives.
- AI-enabled feedback, learning analytics and writing analytics frameworks.
- Building critical thinking and responsible AI use as core capabilities for thriving in a changing world.

Questions we are currently exploring:

1. How can AI empower learners rather than replace their thinking?
2. What would education look like if every student had an ethical AI learning partner?
3. How do we prepare people not just to use AI – but to question it, challenge it and improve it?
4. What if AI could help educators design more inclusive, personalised and human-centred-learning?
5. How do we reimagine assessment and judge outputs in an age of powerful AI—so we value dialogue and understanding?

Where this work makes a difference:

- AI literacy, lifelong learning and workforce capability
- Inclusive and engaging learning experiences
- Assessment and educational practice in the age of AI
- Critical thinking and responsible AI use

Our AI Pillars

Pillar 2

AI Governance, Policy & Sociotechnical Systems

We support governments and organisations to examine how AI reshapes decision-making, policy, equity and institutional trust – helping them to adopt AI more responsibly, while critically examining its impacts on power, equity and institutional trust.

In practice, this includes work such as:

- Examining AI's impact on power, decision-making and organisational systems, including bias and misrepresentation.
- Developing governance insights that support public-sector innovation and responsible AI adoption.
- Advancing research on synthetic data ethics and emerging forms of “shadow AI” in government.

Questions we are currently exploring:

1. How do we ensure AI strengthens democracy rather than undermines it?
2. What kinds of governance help communities feel safe, heard and protected in an AI-driven world?
3. How should governments respond to ‘shadow AI’ tools already shaping public decisions?
4. What does transparency look like when decisions are made with or by algorithms?
5. Who is systematically disadvantaged by algorithmic systems, and what factors contribute to these biases?

Key researchers in this pillar include – Antonette Shibani, Luis Lozano Paredes, Martin Tomitsch, Kate Carruthers, Simon Knight and Sam Wearne.

Where this work makes a difference:

- AI governance, policy and regulation
- Responsible AI adoption and organisational transformation
- Trust, transparency and accountability
- Managing AI risks and strengthening public confidence

Our AI Pillars

Pillar 3

Human–AI Interaction, Data Methods & Decision Support

We design human-centred interfaces, visual analytics and AI-supported tools - helping people work effectively with AI and ensuring systems are usable, explainable and aligned with human judgement.

In practice, this includes work such as:

- Human-data interaction and visual analytics methods that support exploration and decision-making.
- Usable AI tools translated into real-world sectors including health, finance, education and manufacturing.
- Trustworthy, scalable data analysis using large language models.

Questions we are currently exploring:

1. How can we foster AI that collaborates with people — instead of competing against them?
2. What does it take to make AI truly usable, explainable and trustworthy in high-stakes decisions?
3. How can we better combine human judgement with machine intelligence?
4. What if visual analytics could turn complex data into insights anyone can act on?

Key researchers in this pillar include
– Tony (Weidong) Huang, Ali Anaissi,
Martin Tomitsch, Antonette Shibani,
Alice Dong and Zoe Eather.

Where this work makes a difference:

- High-stakes decision-making in industry and government
- Human-centred and explainable AI systems
- Data visualisation and sense-making for complex problems
- AI tools that augment human judgement and build trust in decision-making

Our AI Pillars

Pillar 4

AI for Environment, Resilience & Societal Wellbeing

We enable communities to build more resilient and sustainable futures by exploring how AI intersects with environments and digital infrastructures. Our work considers both how AI can respond to change—and how its underlying systems shape society.

In practice, this includes work such as:

- Applying AI and remote sensing to bushfire resilience, climate-smart agriculture and environmental monitoring.
- Contributing to national strategies and decision-support tools for climate risk, adaptation and resilience planning.
- Examining the environmental, energy, water and other impacts of data centres to inform more sustainable digital infrastructure and climate-resilient planning.

Questions we are currently exploring:

1. How can AI help communities adapt to climate change before crises occur?
2. What if real-time data and machine learning could protect ecosystems as they change?
3. How might AI support farmers, land managers and emergency responders with the information they need most?
4. How do we ensure AI-driven solutions deliver benefits for both people and the environments they depend on?
5. How can AI infrastructures be reimaged and designed to ensure sustainable and equitable futures?

Key researchers in this pillar include
- Arnick Abdollahi, Ali Anaissi and
Environmental AI collaborator,
Bronwyn Cumbo.

Where this work makes a difference:

- Climate adaptation and community resilience
- Environmental monitoring and climate-smart decision-making
- Sustainable digital and AI infrastructure
- Community participation in technology futures
- Understanding AI's environmental and societal impacts

How We Work

Across education, industry and public-sector contexts, our AI research translates into practical frameworks, tools, capabilities and methods that help people and organisations work with AI confidently, ethically and effectively.



We work with communities & industry

Working alongside those using and affected by AI to ensure it reflects diverse needs, experiences and values.



We design for people first

Creating AI systems that are ethical, usable and trustworthy.



We inform policy and governance

Informing governance, regulation and public-sector decision-making through evidence-based research.

We explore future possibilities

Helping people and organisations anticipate emerging risks and opportunities.



We translate research into action

Translating research into practical tools, frameworks and applications that create real-world impact.

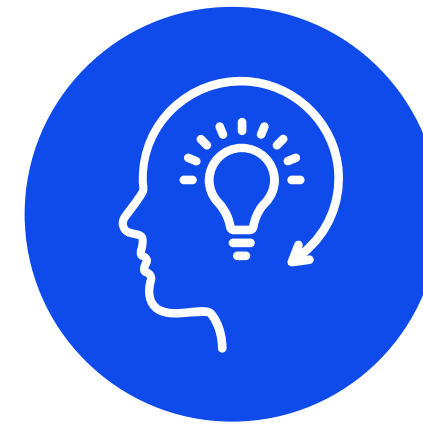


How Research Becomes Impact

At the heart of our approach, we believe the future of AI should not be determined by technology alone.

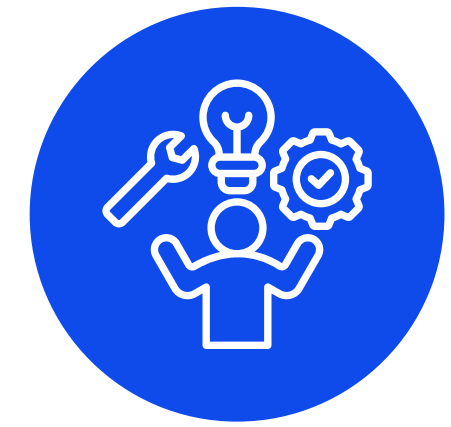
Through collaboration with government, industry, educators and communities, we help ensure AI is shaped by human needs, public values and long-term societal outcomes.

Committed to co-design - we bring diverse voices into conversations about how AI should be developed, governed and used.



Discovery

Generating new insights and knowledge about AI, society and technological change.



Translation

Developing new methods, tools, frameworks, learning programs, governance approaches and decision-support tools.



Adoption

Working with partners to apply and implement research findings in real-world settings.



Societal Impact

Building trusted institutions, capable communities by changing decisions, systems and outcomes.

Impact in the Real-World

Our research moves beyond theory, prototypes and technological hype to ensure AI delivers meaningful benefits for people, organisations and the environments they depend on. Our impact lies not only in developing new knowledge, but in shaping how AI is understood, adopted and governed in practice.

Our research creates impact in four key ways:

Building AI capability for a changing world

We equip students, educators, professionals and leaders with the knowledge and confidence to engage with AI critically, creatively and responsibly. Through AI literacy initiatives, learning analytics research and future-of-work programs, we help people develop the skills needed to thrive alongside emerging technologies.

Strengthening trust, governance and decision-making

Our research informs policy, governance frameworks and organisational practice that support transparent, accountable and responsible AI adoption. By examining issues such as bias, synthetic data, shadow AI and institutional trust, we help organisations navigate complexity with greater confidence and accountability.





Designing AI systems people can understand and use

We create human-centred approaches to AI interaction, visualisation and decision support that make complex systems more usable, explainable and effective. Our work helps ensure AI complements human judgement rather than replacing it, particularly in high-stakes environments

Supporting more resilient and sustainable futures

From climate adaptation and bushfire resilience to digital infrastructure and environmental monitoring, our researchers apply AI while also examining its broader environmental footprint. This helps communities, industry and government make more informed decisions about both the opportunities and consequences of technological change.

Impact in Action

Real challenges. Real people. Real impact.

Building AI capability through education



Through our **Shaping Technologies That Shape Us** program, developed with **Microsoft**, students from diverse disciplines collaborate to design human-centred AI solutions for real-world challenges. By exploring how AI can contribute to the common good, participants build the critical, creative and ethical capabilities needed to shape a rapidly changing technological future

Supporting responsible AI governance

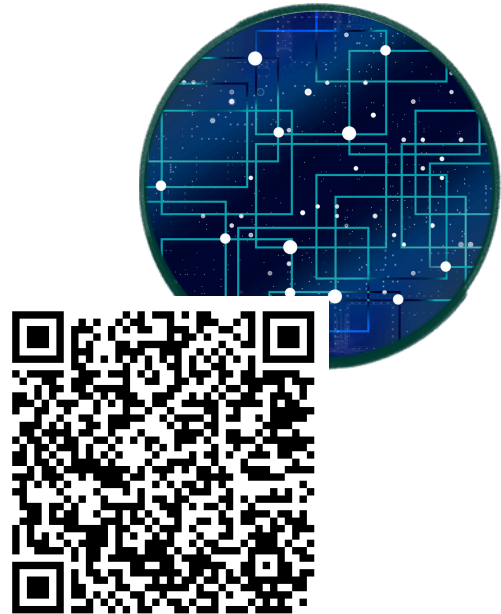


Cultivating deeper, critical engagement, our researchers are advancing explainable AI approaches that help learners and educators understand how AI systems reach recommendations and decisions. By designing transparent, human-centred AI tools, we support greater trust, usability and informed human decision-making.

"The true measure of AI isn't what it can generate, but the difference it can make."

Designing trustworthy human-AI systems

Through projects such as **Mapping AI's role in NSW governance**, our researchers are helping decision-makers understand how generative AI is being integrated into government systems. By examining the social, technical and organisational dimensions of AI adoption, we support more transparent, accountable and responsible governance practices



Reimagining sustainable AI infrastructure

Through research projects such as **Grounding the Cloud**, our researchers are investigating how expanding digital and AI infrastructures are shaping local communities and environments, and, together with industry, government, and local communities, are co-designing more inclusive, sustainable AI infrastructure futures.





Across our research, we
also examine the systems
behind AI – and how they
can be reimagined for
more sustainable and
equitable futures.



The Hidden Systems Powering AI

Interrogating and helping shape the material infrastructures underpinning AI

Some of our research goes beyond applying AI - examining the systems, infrastructures and material realities that make it possible.

We interrogate the environmental, economic, and social impacts of AI infrastructures; their relationship with local communities and environments; and ways to co-imagine and design more equitable and sustainable AI infrastructure futures with community, industry, and government.

This includes work on:

- Data centres and digital infrastructure
- Environmental and energy impacts of AI
- Community participation in shaping technology futures
- Social and material costs of digital transformation

This work ensures AI is not only innovative - but also sustainable, accountable and grounded in real-world impacts.



“Just because we can power AI at scale doesn’t mean we should - at least not without rethinking what sustainability really means in a digital world.”

Bronwyn Cumbo
TD Research
Transdisciplinary School

Why society should care and why this matters:

- Making AI sustainable.
- Ensuring communities have a voice.
- Designing technology futures that work for everyone.

Our Research Team

Transdisciplinary Researchers

Our people are where ideas turn into impact.

Across education, policy, industry and community contexts, our researchers work at the front lines of responsible AI adoption—translating research into tools, practices and insights that reshape real-world decisions, systems and futures.



Dr Luis Lozano-Paredes – Lecturer

AI Governance, Sociotechnical Systems & Responsible Public-Sector Innovation

Luis investigates how AI reshapes decision-making, governance and institutional knowledge systems, with a focus on the public-sector and emerging sociotechnical risks. His research spans platform regulation, synthetic data ethics and the growing challenge of “shadow AI” in government, informing evidence-based policy and responsible adoption frameworks. He brings expertise in analysing AI’s systemic impacts and translating governance insights into practical tools that support transparency, accountability and public-good innovation.

Impact lens: Strengthening trust and decision-making in AI-driven knowledge systems

Dr Samuel Wearne – Lecturer

Sustainability, Futures Studies & AI-Enabled Systems Change



Samuel investigates how people, organisations and institutions can create pathways towards more sustainable and equitable futures. Combining expertise in systems change, sustainability, futures studies and social innovation, he works across disciplines to address complex challenges. His current research includes understanding how AI is being implemented and enacted in the workplace, its place in collaboration and decision-making and what this means for organisations and society.

Impact lens: AI in democracy and decision making to enable sustainable futures

Dr Julien Marchand – Senior Lecturer

Learning design innovation & GenAI-integrated education



Julien specialises in innovative, student-centred- curriculum design and entrepreneurship education. As a member of the TD AI working group, he helps shape how the school integrates Generative AI into teaching and learning—advancing new practices for AI enhanced learning, creativity and student capability building. He also contributes to sector ready program design that increasingly relies on AI augmented learning environments.

Impact lens: Reimagining learning for AI-enabled futures

A/Prof Tony (Weidong) Huang – Director, Data Science & Innovation

Human–Data Interaction, Visual Analytics & AI-Supported Decision-Making



Tony advances human-centred data interaction and visual analytics methods that help people work intuitively and effectively with machine-learning systems. His research translates complex analytical techniques into usable, sector-ready tools applied across health, finance, education and manufacturing—supporting clearer insight, better decisions and real-world impact. He brings deep expertise in designing interfaces and decision-support systems that integrate human judgement with AI-driven intelligence.

Impact lens: Turning complex data into better decisions

Dr Antonette Shibani – Senior Lecturer

AI in Education, Learning Analytics & Human Centred Assessment



Antonette leads research at the intersection of AI, learning analytics and ethical, human-centred education. Her work advances AI enabled feedback, writing analytics and student centred learning frameworks that help learners and educators use AI thoughtfully, critically and creatively. She also co leads GenAI literacy initiatives and co designed curriculum projects that build practical, future-ready AI capabilities across UTS.

Impact lens: Transforming education through ethical, responsible AI

Our Research Team

Transdisciplinary Researchers



Dr Bronwyn Cumbo – Lecturer

Sustainable & Inclusive AI Futures; participatory methods for community-shaped digital and AI infrastructures.

Bronwyn is a transdisciplinary researcher whose work sits at the intersection of human–computer interaction, critical data studies and participatory design, with a focus on how communities, industry and government collectively shape sustainable digital and AI futures. Her research examines the social, environmental and infrastructural implications of AI-driven digital transitions — from data centre expansion to the design of community-inclusive digital systems — using creative and critical participatory methods to help diverse groups navigate complex technological change. She brings expertise in supporting young people and local communities to co-design desirable, equitable and environmentally responsible AI-enabled futures.

Impact lens: Community-led, sustainable and inclusive AI futures



Prof Martin Tomitsch – Head of the Transdisciplinary School

Human–Technology Interaction, Responsible Innovation & Future-Focused Design Leadership

Prof Martin Tomitsch leads research on interaction with emerging and future technologies, with a focus on responsible, human-centred innovation. His work spans AI governance, design for societal impact and the futures of human–AI collaboration, informing public-sector practice and contributing to national and international research initiatives. As Head of the TD School, he brings extensive expertise in design leadership and transdisciplinary collaboration, guiding teams in creating technologies and systems that are ethical, usable and aligned with long-term public good.

Impact lens: Leading responsible innovation in emerging technologies



Dr Simon Knight – Senior Lecturer

AI-Supported Learning, Educational Data Science & Ethical AI Practice

Simon works across learning analytics, AI-supported education, human research ethics and the ethics of emerging technologies, with a focus on how data and AI shape learning, assessment and institutional decision-making. His research integrates human-centred design, critical data literacy and responsible AI practice to support trustworthy educational technologies and informed use of analytics. He contributes expertise across AI in education, governance insights and ethical frameworks that help learners, educators and institutions engage with AI transparently, critically and with confidence.

Impact lens: Embedding ethical AI in learning systems



Dr Ali Anaissi – Senior Lecturer

AI, Bioinformatics & Federated Learning for Applied Health and Education

Dr Ali Anaissi is a Senior Lecturer specialising in AI, bioinformatics and federated learning, with applications across health and education. His work integrates advanced machine-learning methods with privacy-preserving data approaches to support robust, real-world decision-making. He contributes expertise in developing AI systems that enable secure data collaboration, actionable insights and scalable solutions across complex, data-intensive environments.

Impact lens: Enabling secure, privacy-preserving AI systems

Our Research Team

Transdisciplinary Researchers



Dr Arnick Abdollahi – Lecturer

AI, Remote Sensing & Climate-Resilient Environmental Futures

Arnick applies machine learning and remote sensing to help communities and industries understand and respond to environmental and climate challenges. His work spans bushfire resilience, climate-smart agriculture and environmental monitoring, contributing to national strategies and decision-support tools that strengthen adaptation and sustainability. He brings deep expertise in translating data-driven methods into practical insights that support resilient, future-ready ecosystems and communities.

Impact lens: Building climate resilience through applied AI



Dr Sean Walsh – Senior Lecturer

Human–AI Collaboration, AI-Supported Practice & Emerging Workflows

Sean explores how AI can function as a collaborative “team member,” advancing human–AI interaction and decision-support practices across learning, organisational contexts and emerging workplaces. His work investigates the limits and possibilities of AI as a partner in reasoning, creativity and complex problem-solving—helping students, educators and professionals navigate new forms of collaboration with machine intelligence. He contributes expertise across AI-supported learning, human-centred assessment and the design of practical, trustworthy workflows that integrate human judgement with AI-driven insight.

Impact lens: Designing productive human–AI learning partnerships



Dr Helena Robinson – Senior Lecturer

Transdisciplinary Education, Museum & Cultural Systems; AI’s impact on learning, creativity & professional practice

Helena’s research spans museum studies, cultural systems, transdisciplinary education and collaborative learning, with a focus on how people make meaning across institutional, cultural and disciplinary boundaries. Her recent work examines the evolving role of AI in higher education and professional practice, including how generative AI is reshaping learning, creativity, collaboration and student preparedness for rapidly changing workplaces. Grounded in her background in museums and GLAM-sector research, she brings deep expertise in stakeholder engagement, collaborative problem-solving and experiential learning—informing new approaches to teaching, innovation and interdisciplinary inquiry.

Impact lens: Learning, creativity and culture in AI-shaped worlds



Alice Dong – Associate Professor

Design Innovation, Human–AI Interaction & Decision-Centred Design

Alice is a design researcher whose work sits at the intersection of design innovation, human–AI interaction and decision-making in complex sociotechnical systems. Her research explores how design methods can shape the development and use of AI-supported systems—particularly in contexts where uncertainty, risk and multiple stakeholder perspectives are present. She examines how human judgement, data and intelligent technologies can be integrated through design to support more transparent, responsible and effective decision-making. She brings deep expertise in design-led inquiry, visualisation and transdisciplinary collaboration to help organisations and communities work productively with AI in complex real-world contexts.

Impact lens: Designing better decisions with human-centred AI

Our HDR Team

Higher degree by research



Kate Carruthers – PhD candidate

AI Governance, Innovation Policy & Public-Sector Transformation

Kate Carruthers is a PhD candidate and researcher in AI governance and innovation policy, with a focus on how emerging technologies reshape organisational decision-making and public-sector systems. Her work examines the institutional, regulatory and ethical implications of AI adoption, contributing insights that support transparent, accountable and future-focused government practice.

Impact lens: Shaping future-ready AI policy and governance



Zoe Eather – PhD candidate

Data Visualisation, Human–AI Interaction & Visual Storytelling

Zoe Eather is a PhD candidate, researcher and designer whose work focuses on data visualisation and visual storytelling to make complex, AI-enabled analysis understandable and actionable. Her research explores how people interpret, trust and use data through visual representations, particularly in contexts of uncertainty and emerging AI technologies. Through design-led research and experimentation, she investigates how visualisation can support sensemaking, communication and decision-making across education, research and public domains.

Impact lens: Making AI-driven data clear and actionable



Dean Hargreaves – PhD candidate

Assessment, Learning Design & Educational Innovation

Dean Hargreaves is a PhD candidate whose research focuses on assessment, learning design and educational innovation in an AI-shaped learning landscape. As founder of Goalice AI, he translates research-informed approaches to feedback, assessment and learning design into practical AI tools for education and professional practice. Bridging academic research and real-world application, his work explores how generative AI can be integrated into learning and assessment in ways that are rigorous, transparent and meaningful—helping institutions implement AI responsibly at scale.

Impact lens: Translating AI into practical assessment and learning systems

Ajanie Karunanayake – Higher Degree by Research (HDR) Candidate

Generative AI, Information Seeking & Learning Practices



Ajanie Karunanayake is a Higher Degree by Research candidate exploring how generative AI is reshaping information seeking, sensemaking and learning in educational contexts. Her research examines how students use AI tools to find, evaluate and synthesise information, and the implications for learning quality, critical thinking and academic integrity. Her work informs AI-supported learning environments, AI literacy initiatives and evidence-based approaches to responsible AI use in education.

Impact lens: Information literacy and learning in AI-enabled education

Mohsen Ebrahimzadeh–Higher Degree by Research (HDR) Candidate

Generative AI, Academic Integrity & Assessment



Mohsen Ebrahimzadeh is a Higher Degree by Research candidate exploring the implications of generative AI for academic integrity, assessment design and educational practice. His research examines how AI-generated content challenges traditional approaches to authorship, originality and evaluation, and how institutions can respond through redesigned assessment, policy and guidance. His work contributes evidence-based approaches that support fair, transparent and resilient learning environments while preparing educators and students to engage responsibly with emerging AI technologies.

Impact lens: Fair assessment and integrity in AI-enabled education

Who We Work With

We collaborate with government, industry, education and community partners across Australia and internationally through research, student learning, professional education and innovation initiatives that help organisations navigate technological change and create positive impact.



Government



Industry



Educators



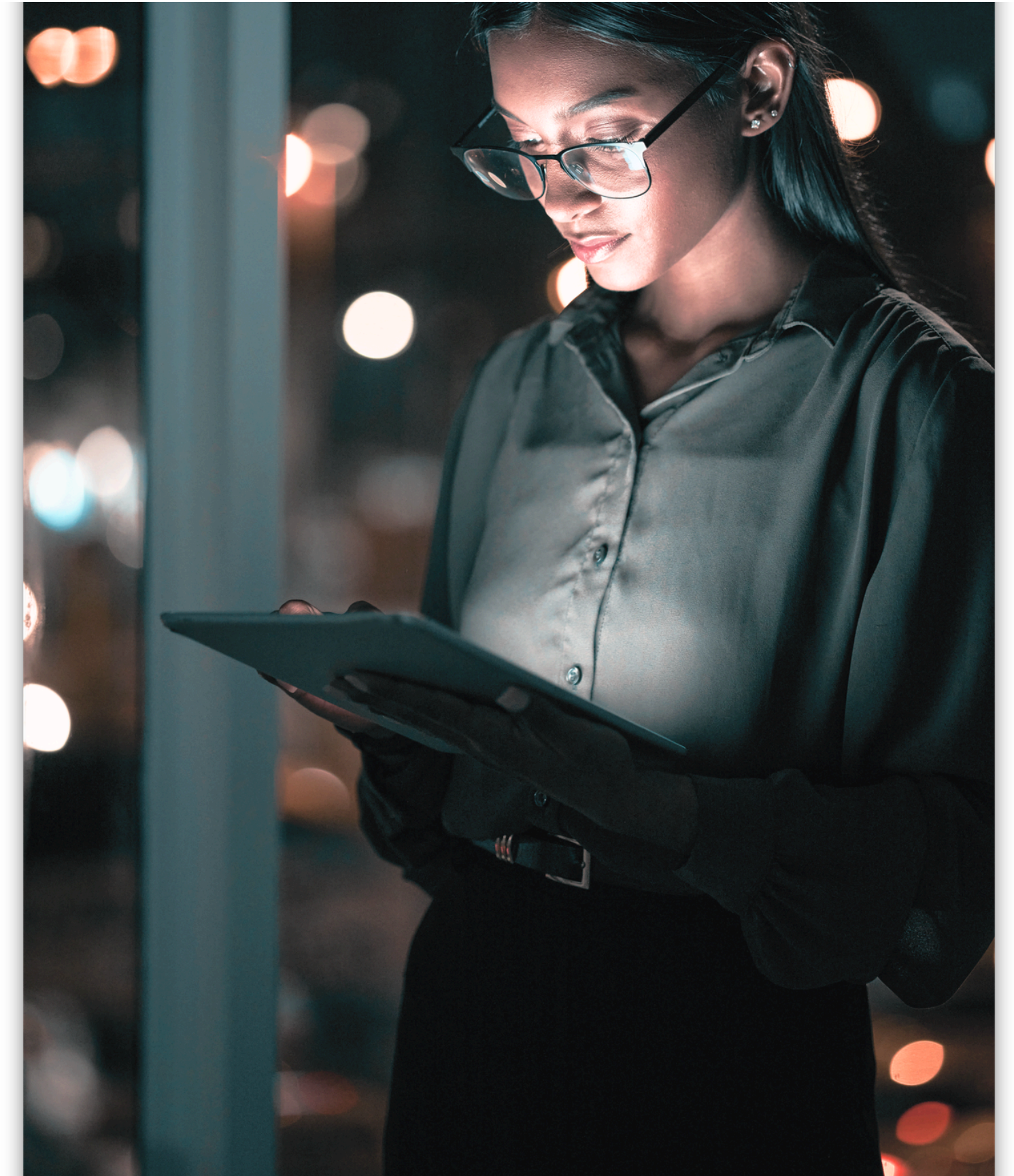
Community



Related Reading and Resources

Publication examples informing real-world policy, practice and system design

- Co-authorship integrity: Reconceptualising assessment validity for the age of generative artificial intelligence - [Link](#)
- Towards a public understanding of AI: on the design and delivery of an introductory course for a general audience - [Link](#)
- Perspectives on civics and citizenship education in Australia: Findings from the recent inquiry through AI-augmented analysis - [Link](#)
- The use and usefulness of GenAI in higher education: Student experience and perspectives - [Link](#)
- GenEDIt: A Context-Aware Equity, Diversity and Inclusion Principles Integration Tool for Software Engineering Education - [Link](#)
- Ethical AI governance: Mapping a research ecosystem - [Link](#)
- Untangling critical interaction with AI in students' written assessment - [Link](#)
- Cultivating critical engagement as student automated feedback literacy - [Link](#)
- Supporting Information Problem Solving in the Age of Misinformation and Generative AI - [Link](#)
- Can Australia build one of the world's largest data centres? - [Link](#)
- Submission to the NSW Parliamentary Inquiry into Data Centres - [Link](#)



Partner With Us

If your organisation is navigating the opportunities and risks of AI, TD Research offers a proven, transdisciplinary approach - helping you design, apply and critically engage with AI in ways that create lasting value.

- What challenge could we solve together that none of us can solve alone?
- Where could your organisation benefit from ethical, evidence-based AI research?
- How might we co-design AI systems that serve your community, industry or mission?
- What future do you want AI to help you build — and how can we help you get there?

Start the conversation, contact us at - TDRResearch@uts.edu.au and let's shape the future of AI—together.



FIND OUT MORE
ABOUT TD RESEARCH

