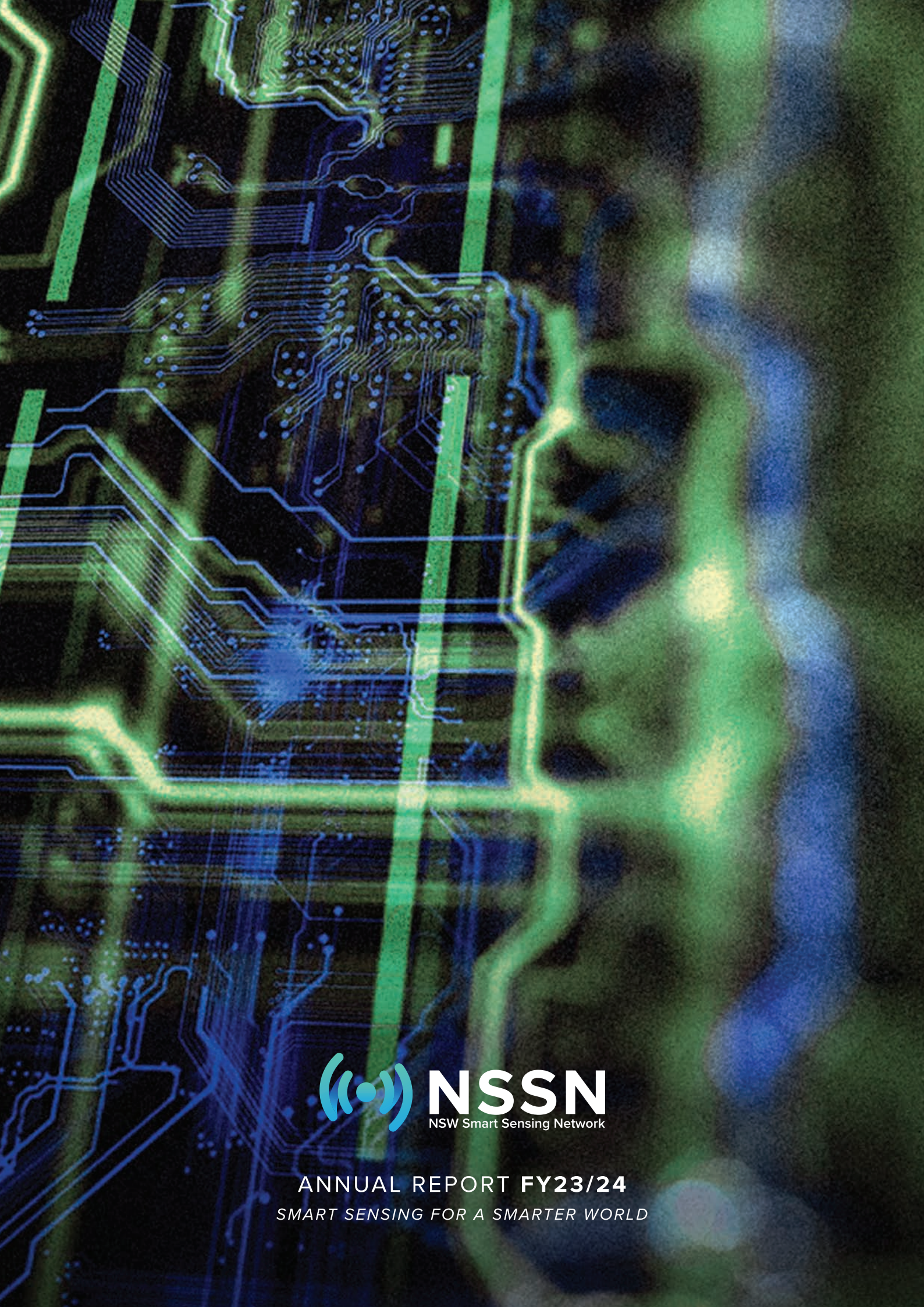


NSSN

NSW Smart Sensing Network

ANNUAL REPORT **FY23/24**

SMART SENSING FOR A SMARTER WORLD

PROUDLY FUNDED BY

Foreword by Board Chair

In a year that saw increased industry and public awareness of the benefits of revolutionary technologies like quantum and AI, it is encouraging to recognise the synergistic role of smart sensing in delivering novel solutions to some of our time's most complex challenges.

The role of the NSW Smart Sensing Network is two-fold. Firstly, it exists to translate world-class research into compelling solutions to grand challenges in areas like human health, environment, energy, sovereign manufacturing, global security and building smarter cities. Secondly, it has a remit to position New South Wales as a leader in smart sensing innovation and in so doing, create prosperity for the people of this state. To achieve these joint aims, the NSSN brings together universities, government and industry in a triple helix of collaboration to drive innovation.

Our consortium consists of the leading universities across NSW and the ACT. We are proud when we say that working with the NSSN opens access to the brightest minds and most cutting-edge research in NSW and, indeed, Australia.

FY23/24 was another busy year for the NSSN as it continued to consolidate its reputation as a trusted broker in the NSW innovation landscape. Now entering its ninth year, the NSSN is firmly focussed on the next horizon. Over the past 12 months we consulted broadly with our varied stakeholders to shape our future direction.

The resulting NSSN Strategic Plan 2024-27 refined our vision and mission. The NSSN's new vision is NSW is home to a thriving ecosystem for smart sensing innovation, and our mission is to accelerate solutions to complex and critical challenges by translating world-class smart sensing research. Our values, priority themes, objectives and strategies were also revised to be future-ready.

The NSSN Board is deeply committed to the network's success and its ability to deliver to the people of NSW. The Board comprises rich expertise from across the government, research and industry domains. In FY23/24, we thanked outgoing Board member, Frank Zeichner, CEO of the IoT Alliance, for his four years of service. We also established a deputy Chair role and appointed Board Member Jill Freyne to this position. I thank the Board for the leadership, advocacy and wisdom they so generously provide to the NSSN.

I also extend my gratitude to our member universities, brilliant researchers, innovative partners, outstanding Co-Directors, dedicated Chief Operating Officer, committed team, and the unwavering support of the NSW Government through the Office of the Chief Scientist & Engineer, Professor Hugh Durrant-Whyte.

JO WHITE
Chair of NSSN Board

Co-Directors' Message

In its eighth year, the NSW Smart Sensing Network (NSSN) further consolidated its position in the NSW innovation ecosystem as a trusted and independent broker bringing together universities, government and industry partners.

The NSSN now proudly celebrates 38 completed innovative projects applying smart sensing solutions in impactful ways to challenging societal problems to a value of $16.4 million and 19 active projects to a value of $14.2 million. As you read through this annual report you will learn more about the impact of the NSSN's projects across a broad span of areas as diverse as improved flood intelligence for western NSW, to instantaneous lightning detection for bushfire management, and novel sensing technologies that will allow the aged to stay healthy at home.

In FY23/24, we launched our new Strategic Plan that will guide the network over the next three years from 2024-26. The plan responds to feedback from our industry, government, university and community stakeholders and the evolving priorities of the Commonwealth and the NSW Government. It reframes our priorities around five key themes of environment & agriculture, human health, natural hazards, net zero and smart places. We know that these are areas of great importance to Australian society and where smart sensing has a unique role in providing innovative solutions.

Our work is increasingly being recognised by a range of awards. We were pleased the OPENAIR project won this year's Healthy Planet, Healthy People Award at the National Banksia Sustainability Awards in April, and the Research Award at the IoT awards in June.

Like the broader Australian innovation ecosystem, the NSSN faces headwinds from economic constraints affecting our government, industry and university partners alike. This is borne out in subdued results against our ambitious KPIs in FY23/24 and is expected to continue into FY24/25.

Challenging times call for visionary thinking and bold action and the NSSN remains well-positioned to navigate pathways to unique opportunities. Working collaboratively, we can achieve far more than what any one of us can achieve working alone. Our consortium approach, combined with our track record of success, makes us more convinced than ever of the unique value of the NSSN.

We invite you to read on for a more detailed report on the NSSN's achievements in FY23/24.

PROFESSOR
BENJAMIN
EGGLETON
Co-Director, NSSN

PROFESSOR
JULIAN EPPS
Co-Director, NSSN

“I really can’t overstate the importance of having early adopters for emerging technologies, especially unique deep tech like quantum sensing. Having NSSN and Sydney Water as partners to demonstrate use cases for our technology has been amazing.”

KYLE HARDMAN, **CEO, NOMAD ATOMICS**

Contents

About the NSW Smart Sensing Network (NSSN)

The NSW Smart Sensing Network (NSSN) was established in July 2016 with funding from the NSW State Government through the Office of the Chief Scientist & Engineer.

It was founded on the premise that the economy and people of New South Wales face key challenges in energy, resources, manufacturing, the environment, transport, agriculture, space and health that cutting-edge research in smart sensing could play a critical role in solving.

The market for smart sensing across a broad range of industries is growing. The NSSN brings together the world-class research taking place in NSW universities with state government agencies and industry to develop innovative solutions to these key challenges and, at the same time, position NSW as a leader in sensing technology.

OUR MISSION

To accelerate solutions to complex and critical challenges by translating world-class smart sensing research.

OUR VISION

NSW is home to a thriving ecosystem for smart sensing innovation.

OUR VALUES

SOLUTIONS ORIENTED

We take a lead in identifying challenging problems that our network can solve. We activate and accelerate the development of solutions. We are agile.

INNOVATIVE

Our approach is pioneering as we drive research towards innovative products and services.

TRUSTED

We are trusted to provide deep expertise and quality solutions. We build trust among collaborators.

COLLABORATIVE

We co-design solutions. We bring people together across universities, disciplines, industry and government. Our team compliments capabilities of our Members.

IMPACTFUL

We pursue research that benefits lives, the planet and the economy. We deliver on the investments of the NSW government, our members and partners.

DIVERSITY

People are at the heart of all that we do and our people represent rich diversity in all its forms. Diversity breeds innovation and we cultivate a culture of inclusion.

Our Priorities

Members

We bring together smart sensing expertise from across the leading universities in NSW & the ACT to develop innovative, interdisciplinary solutions to complex challenges. Our University members co-fund the network.

Australian National University

MACQUARIE University
SYDNEY·AUSTRALIA

UNSW SYDNEY

THE UNIVERSITY OF SYDNEY

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

UNIVERSITY OF WOLLONGONG AUSTRALIA

UTS

WESTERN SYDNEY UNIVERSITY

People

The NSSN is led by two internationally recognised scientists who are leaders in their respective fields of physics and electrical engineering and bring a wealth of expertise to the network's ambitious program of research, innovation and industry collaboration.

The NSSN Board, chaired by Jo White, and consisting of experienced leaders across the policy, research and industry spectrum provide guidance and oversight on network strategy and direction.

The NSSN Members' Committee consists of senior representatives of each of the member universities and the NSW Office of Chief Scientist & Engineer. It ensures that member universities and government imperatives guide the strategy and activities of the network. A lean central team of talented staff lead the priority themes and coordinate the operations of the network.

CO-DIRECTORS

PROFESSOR
BENJAMIN EGGLETON
Co-Director, NSSN

PROFESSOR
JULIAN EPPS
Co-Director, NSSN

BOARD

The NSSN Board, chaired by Jo White, and consisting of experienced leaders across the policy, research and industry spectrum provide guidance and oversight on network strategy and direction.

JO WHITE
Chair

DR DIANA DAY
Board Member

DR JILL FREYNE
Board Member

HEBBAT MANHY
Board Member

DR IAN OPPERMAN
Board Member

FIONA RANKIN
Board Member

FRANK ZEICHNER
Board Member

CAROLINE RESIDOVIC
Ex-Officio,
NSW Government
Representative

PROFESSOR
JULIE CAIRNEY
Ex-Officio,
University of Sydney

PROFESSOR
DANE MCCAMEY
Ex-Officio, UNSW

People

MEMBERS' COMMITTEE

The NSSN Members' Committee consists of the Pro Vice-Chancellors (Research & Innovation) or equivalent and represents the members' interests in the strategic direction of the Network.

WARWICK DAWSON
Pro Vice-Chancellor (Industry & Engagement), University of Newcastle

DR PAUL DI PIETRO
Dean of Research Knowledge Exchange and Translation, University of Wollongong

PROFESSOR DAN JOHNSON
Pro Vice-Chancellor (Research, Innovation & Enterprise), Macquarie University

PROFESSOR KATHRYN MCGRATH
Deputy Vice-Chancellor (Research), UTS

PROFESSOR UTE ROESSNER
Director, Research Initiatives & Infrastructure, ANU

PROFESSOR DEBORAH SWEENEY
Deputy Vice-Chancellor and Vice-President, Research & Innovation, Western Sydney University

STAFF

The NSSN consists of a lean central team of talented staff who lead the priority themes and co-ordinate the operations of the network.

NICHOLAS HASKINS
Chief Operating Officer

LAURA EARL
Net Zero Theme Lead

TOMONORI HU
Environment & Agriculture Theme Lead

DIANE NAZAROFF
Media & PR Manager

CATHERINE OATES SMITH
Human Health Theme Lead

RUPA PATNAIK
Project Administrator

PETER RUNCIE
Natural Hazards & Smart Places Theme Lead

AYU SARASWATI
Digital & AI Theme Lead

Executive Summary

In FY23/24, our R&D program grew to 28 projects under active management, with collaborative projects ranging from improved flood intelligence for western NSW, to instantaneous lightning detection for bushfire management, to novel sensing technologies that will allow the aged to stay healthy at home.

The third round of the **NSSN Grand Challenge Fund (GCF)** directly invested $446,227 of NSSN funds to seed innovative R&D projects that pair industry/government need with university research expertise to address challenges across the five defined NSSN Grand Challenges of Ageing, CleanTech, Natural Hazards, Smart Places and Water. A total of 13 applications were received to the 2024 fund, seven of which were funded, representing a 54% success rate and leveraging industry co-investment of $448,198.

Our **Business Development program** continues to build a strong pipeline of opportunities that uplift the industry collaboration capability of our member universities. In FY23/24, the NSSN attracted $2.65 million in commissioned research across 15 projects.

Our busy **Industry Engagement program** hosted 16 events across the state, including Sydney, Parramatta, Newcastle, Wollongong and Bathurst. The NSSN *Sensing the West* Forum at WSU Parramatta explored opportunities for better outcomes as NSW builds the homes and jobs of the future in greenfield development sites such as Bradfield and the Aerotropolis. The *Textiles in the Circular Economy* Workshop at the University of Newcastle brought together key stakeholders from the Hunter region to examine the role smart sensing can play in textiles circularity.

We continued our *Women in Sensing* series, shining a spotlight on female entrepreneurs and researchers who are making an impact in smart sensing, and our popular industry engagement series, *Sensing Industry Connect*, continued to bring together manufacturers, developers, deployers and researchers across the sector. Our events have been recognised for not only bringing together our community but for leading the conversation and seeding new collaborative projects.

The work of the NSSN is also making **policy impact.** The NSSN's successful air quality sensing program, *OPENAIR*, produced the Best Practice Guide to Air Quality Sensing that was added to the NSW Government SmartNSW Case Study Library, and made a submission to the NSW Legislative Council's Planning & Environment Portfolio Committee. The NSSN was also **commissioned by OCSE to deliver** the consultation phase (Phase I) of the NSW Natural Hazards Detection Network innovation procurement program in support of NSW State Disaster Mitigation Plan.

The innovative work of the NSSN in pioneering new forms of impactful collaboration and engagement is also being recognised with **a growing number of awards**, including the IoT Impact Award for Research, the Banksia Foundation National Award for Sustainability, the CASANZ Innovation & Excellence in Air Quality Award, and the Australian Information Industry Association iAward (ACT) for Sustainability & Environment. These awards are further proof of the impact of NSSN projects.

We broadened our audience through our **Public Outreach program**. Across our events and digital, social and traditional media, we seek to engage, educate and inform both the scientific and general community on issues relating to smart sensing innovation. Our LinkedIn community grew to 3,714 followers. We achieved 80 mentions across print, online and broadcast media and increased readership of the monthly NSSN e-newsletter, *The Sensor,* to 2,724 readers.

We continue to take a leadership role amongst our fellow innovation networks, providing advice on network management, collaborating on events and partnering to amplify our impact. We were particularly proud to partner with the NSW Connectivity Network to deliver the joint Sensing for Disasters Fund.

We invite you to read on for a more detailed report on the NSSN's achievements in FY23/24.

FY 23/24
By the Numbers

28

ACTIVE R&D MULTI-PARTNER PROJECTS UNDER NSSN MANAGEMENT

$2.6m

NEW RESEARCH FUNDING

16

INDUSTRY ENGAGEMENT EVENTS HOSTED BY NSSN

$446,227

GRAND CHALLENGE FUNDING AWARDED

82

MEDIA MENTIONS

3,714

LINKEDIN FOLLOWERS

“NSSN has been instrumental in connecting me with several industry partners, including LB Agtech, which played a crucial role in supporting my ARC Hub application. Their support and guidance have been invaluable in advancing my research and fostering impactful collaborations.”

ASSOCIATE PROFESSOR NOUSHIN NASIRI, **MACQUARIE UNIVERSITY**

NSSN
R&D Program

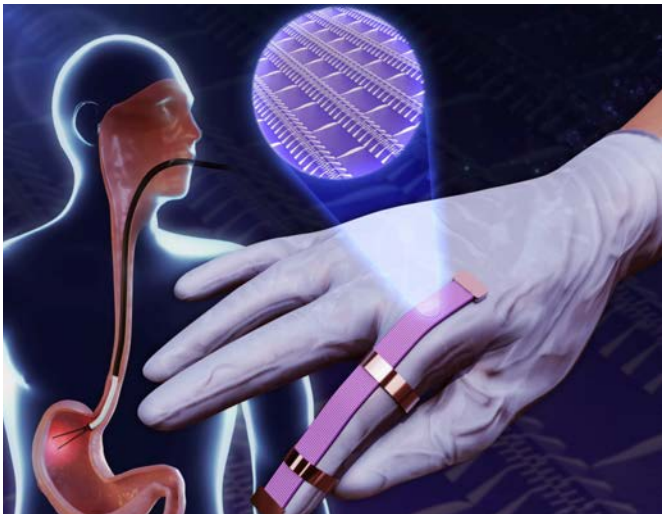
THE NSSN RUNS AN ACTIVE RESEARCH AND DEVELOPMENT PROGRAM,
WITH 28 ACTIVE R&D PROJECTS UNDER MANAGEMENT IN FY23/24

ARC Industrial Training Research Hub for Connected Sensors for Health

CASH FUNDING	$9.6 million
PARTNERS	Sante Innovation, Nutromics, Genesys Electronics Design, Vlepis, Nthalmic and 11 other industry partners across the MedTech sector

UNIVERSITY MEMBERS

UNSW SYDNEY · MACQUARIE University · THE UNIVERSITY OF NEWCASTLE AUSTRALIA · UNIVERSITY OF WOLLONGONG AUSTRALIA



The ARC Research Hub for Connected Sensors for Health is a collaboration between universities and industry involved in cutting-edge research seeking to position Australia at the forefront of connected health. The Hub conducts research into biophysical and biochemical sensors, addresses energy solutions sources, and closes the loop on data analytics and privacy and data security for improved health outcomes. The goal of the Hub is to co-design, verify, and certify sensor technology to transform health care in Australia by enabling new approaches to diagnosis, monitoring, predictive treatment and prevention of disease. By bringing together a diverse range of expertise from academia and industry, the Hub is paving the way for innovative approaches to diagnosing, monitoring, predicting, treating, and preventing diseases.

ARC RESEARCH HUB FOR CONNECTED SENSORS FOR HEALTH

Smart Triaging and Wellbeing in Aged Care

CASH FUNDING	$1.48 Million
PARTNERS	Vlepis, Allambie Heights Village, Careteq

UNIVERSITY MEMBERS

UTS

The proportion of the Australian population aged 60 or over is projected to double by 2031 and the cost to deliver aged-care services to our ageing population is expected to grow beyond $40b. The Aged Care Quality and Safety Royal Commission underlined under-performance and excessive workloads in the aged care sector. To deliver sustainable high quality aged care, the aged care system must be digitally transformed and enable elderly people to stay in their homes for longer.

This project aims to build an integrated smart triaging platform that leverages data science and new Australian-manufactured sensing technologies to automatically identify health and wellbeing events that notify the relevant care staff. The project develops and then leverages low-cost, unobtrusive wearable sensors that will actively monitor the users' wellbeing biomarkers such as heart rate, blood oxygenation and temperature for optimal detection and triage. It aims to improve the well-being of at-risk Australians, reduce hospital admissions, save lives and improve access to care in remote communities.

Sensing Microplastics in Water

CASH FUNDING	$1,000,000
PARTNERS	Pegras

UNIVERSITY MEMBERS

THE UNIVERSITY OF SYDNEY

Microfibres are minuscule synthetic particles shed from textiles, clothes, tyres, shoes and a range of industrial processes. These microplastics are an environmental pollutant which eventually end up in oceans, rivers and even drinking water sources, posing risks to marine life and human health.

This project uses novel smart sensing technologies to identify and remove medical plastics waste from entering the wastewater stream. After successfully completing Phase I of the inaugural round of the NSW Small Business Innovation & Research Program (SBIR), this project progressed to Phase II in FY22/23, which focused on developing the solution's proof-of-concept model. In a landmark development for environmental technology, Pegras has now developed the world's first scalable microfibre removal system from industrial laundry wastewater.

EcoEar Detection of Koala Calls

CASH FUNDING	$903,000
PARTNERS	Biodiversity Monitoring Services

UNIVERSITY MEMBERS

WESTERN SYDNEY UNIVERSITY

Koalas are a threatened species in NSW. Current methods of counting koalas include manual field surveys which have limited coverage and provide logistical challenges. After successfully completing Phase I of the inaugural round of the NSW Small Business Innovation & Research Program (SBIR), this project secured Phase II funding to build a proof-of-concept model.

This project successfully tested the feasibility of changing from traditional acoustic recording systems to an AI-powered edge device, the EcoEar. The EcoEar is only triggered by koala calls for enhanced monitoring of NSW's endangered koala population. These neuromorphic systems are specially built to react to changes in the environment, like our sensory systems, and only detect and record data when calls are made. Such a system is extremely power-efficient and produces targeted, actionable data making large-scale monitoring feasible and efficient.

Modelling Thermal Comfort Indices for Greater Sydney

CASH FUNDING $333,000

PARTNERS Sydney Water, SmartSat CRC

UNIVERSITY MEMBERS

Escalating intensity and frequency of heatwaves in Sydney are impacting urban liveability, leading to increased water demand and exacerbating negative health outcomes. Outdoor human thermal comfort is a key metric to assess urban liveability. There is a need to provide real-time, high spatial resolution outdoor human comfort data that can capture how radiant heat changes depending on the amount of urban greening, irrigation, change of seasons, and the built environment.

In this project, researchers are characterising urban heat around the Greater Sydney Region using earth observational imagery, land segmentation and ground truth data. A model is being developed using site data gathered around Sydney from an assortment of environmental sensors in combination with a machine learning algorithm to segment Greater Sydney into distinct urban topologies. This is being computed at the edge on a nanosatellite, where periodic earth observation updates of Sydney's continually evolving terrain is allowing for dynamic and scaled outdoor human thermal comfort calculations.

Instantaneous Detection of High-Risk Lightning With Pinpoint Accuracy

CASH FUNDING $250,000

PARTNERS Fire Neutral Network, NSW Rural Fire Service, ACT Government, ACT Fire & Rescue

UNIVERSITY MEMBERS

Lightning is the primary cause of large bushfires in Australia. Yet only a small fraction of lightning strikes is capable of starting a fire. Quickly and accurately detecting these lightning ignitions is essential for rapid fire containment and suppression, and to prevent subsequent loss, but currently there is no system in Australia which can reliably provide this critical information.

This NSSN Grand Challenge project utilised novel lightning detectors capable of measuring the attributes of High-Risk Lightning (HRL), including long continuing currents and charge transfer, which lead to heating. Fire agencies can then efficiently target this small proportion of HRL strikes. In addition, the smart detectors can map lightning in 3D, leading to superior detection efficiency and location accuracy, and facilitating a quicker, more efficient inspection of high-risk ground strikes.

This outcome is accomplished using a machine learning algorithm to analyse electric field waveforms from the lightning detector, to identify the presence of long-continuing current. This unique characterisation of lightning strikes is combined with information about weather and fuel attributes derived from satellite and airborne sensors, to enable a more thorough characterisation of the conditions under which lightning ignitions occur.

The MOSAIC Study: Motion Optic and Sound Sensors to Assess Interactive Communication

CASH FUNDING $213,008

PARTNERS Cochlear, Google

UNIVERSITY MEMBERS

Hearing loss disrupts the pathway to healthy ageing and independent living by increasing communication difficulties. While hearing devices are helpful, listening through devices means communication can still be difficult, and breakdowns inevitably still occur. Hearing devices need to be tailored to the dynamics of the communication environment, including background noise which impacts intelligibility (e.g., TV, street traffic, cafes). Data from sensors can predict conversational difficulty and communication breakdowns by tracking gaze and head movements in the lead-up to the breakdown. The next step is to leverage this knowledge to selectively enhance hearing devices.

In this project, researchers are identifying which biomarkers have the greatest predictive power in detecting communication difficulty and in predicting communication breakdowns. This will allow the fusion of sensor networks with next-generation signal processing algorithms and hearing technologies. Researchers are also assessing a large cohort of normal-for-age hearing listeners across the lifespan (baseline data and ageing effects) as well as older bilateral cochlear implant recipients.

Smart Energy Asset Management Intelligence

CASH FUNDING $200,000

PARTNERS Global Sustainable Energy Solutions, APVI, Lake Macquarie City Council, 5 Local Government Councils across NSW

UNIVERSITY MEMBERS

Australia has world-leading per capita installation of distributed energy systems (e.g. Solar PV and Energy Storage), but most of these are not monitored for performance due to high costs and technical challenges. Existing fault diagnosis is often conducted by a contractor going on site, which leads to delays and high costs. Some providers offer analytics via additional monitoring devices; however, these do not have access to the detailed data available from the energy system's own devices, and do not link insights to asset management systems.

This NSSN Grand Challenge project enables automatic performance monitoring of distributed energy systems by leveraging in-built sensors in system inverters, power electronics and control systems. The knowledge, methods and algorithms developed as part of this project will provide smart energy asset owners with the actionable intelligence required to maintain their portfolio of systems. This will reduce operational administration for the asset owner, allow for financial and performance transparency, and ensure that maintenance regimes are optimised and tracked for asset owners.

Novel Testing Methodologies for Deployable Detection of Water Pathogens

CASH FUNDING	$200,000
PARTNERS	BioPoint Ltd

UNIVERSITY MEMBERS

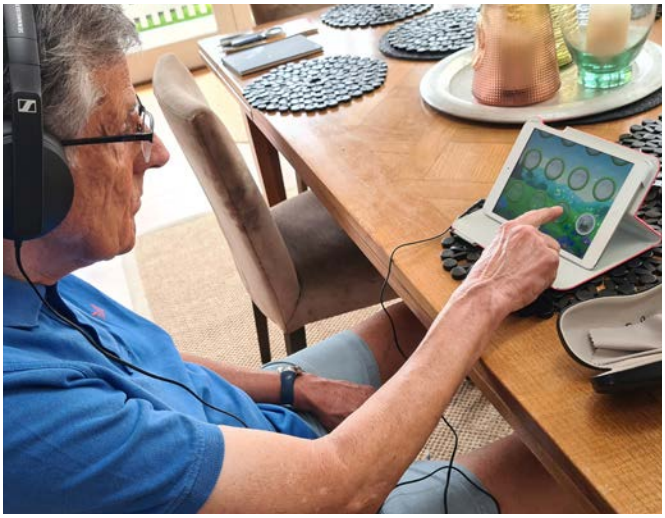
The widespread access to clean drinking water is said to be one of the most significant health achievements of the 20th century. Testing the safety of drinking water remains a critical component of safe water supply, however the methods to test contaminated water have not changed in decades. Pathogens such as Giardia and Cyrptosporidium, coming from faeces of infected people or animals, are difficult to detect with sensors as their signature molecules become extremely diluted. Existing tests are slow to produce results, and often the consumption of water occurs before the results appear. A testing kit is needed that both has ultra-low level of detection and able to be rapidly performed.

This project explores the use of CRISPR technology (awarded the Nobel Prize in 2020) to develop a biosensor with ultra-low detection limits. The specific technique of using CRISPR sensors, developed between UNSW and industry partner BioPoint, has achieved sensitivities orders of magnitude higher than state-of-the-art methods – enabling rapid testing times. This project is building on this development and is scaling up the manufacturing of necessary reagents for the test.

SOUND-BITES Program

CASH FUNDING	$200,000
PARTNERS	Sound Scouts, Cochlear, Meals on Wheels NSW

UNIVERSITY MEMBERS



Hearing loss affects 75 percent of Australians aged 65+ years, increasing to 90 percent of those aged 80+ years. Untreated hearing loss is associated with loneliness, depression, frailty, and increased falls. Importantly, recent research identified midlife hearing loss as the single largest modifiable risk factor for a future dementia diagnosis.

This NSSN Grand Challenge project capitalises on an untapped opportunity to improve the management of hearing health across the NSW Meals on Wheels (MoW) network of more than 22,000 clients, which is served by 14,000 volunteers. By providing volunteers with user-friendly hearing screening tools to identify hearing issues in homebound seniors as part of routine wellbeing checks, this project will promote access to hearing services and use of hearing sensing technologies. The project team will train 60 volunteers on screening for hearing loss using the Sound Scouts app and teach them how to communicate the test results to 600 clients at five Sydney sites.

A New Sensor-Based Monitoring System for the Early Detection of Heart Failure

CASH FUNDING $200,000

PARTNERS Medical Monitoring Solutions

UNIVERSITY MEMBERS

Heart failure affects 480,000 Australians, with over 60,000 new diagnoses made every year. The global heart failure monitoring systems market has a five types of monitoring devices which determine the status of heart failure progression, however none of these have the significant advantage of being non-invasive.

This new non-invasive sensor system is designed for the early detection and improved management of heart failure patients with the aim of reducing hospital admissions and readmission. This NSSN Grand Challenge project involves sensors that are mounted on the body, an app that displays signals, and key data/risk scores and notifications from the clinical team regarding the patient care plan. It also includes a cloud database for signals and biometric data, and a clinician portal to allow the care team to remotely access data and deliver personalised care plans to the patient based on data from the sensors. This project will advance the system from prototypes to product designs and complete a clinical evaluation.

Autonomous Drones on Reservoirs for Smoke Detection

CASH FUNDING $199,985

PARTNERS Sydney Water, NSW Rural Fire Service, NSW Fire & Rescue, Southern Cross Drones

UNIVERSITY MEMBERS

Firefighters in the NSW Rural Fire Service (RFS) are constantly putting their lives at risk to gain increased visibility of bushfires. The RFS has identified how advances in various technologies, including weather forecasting, aircraft, sensors and telecommunications, have assisted in improving visibility while mitigating human risk. This NSSN Grand Challenge project aims to supplement these tools and offer an additional source of visual information to fire services that leverages existing infrastructure owned by Sydney Water and autonomous drone technology.

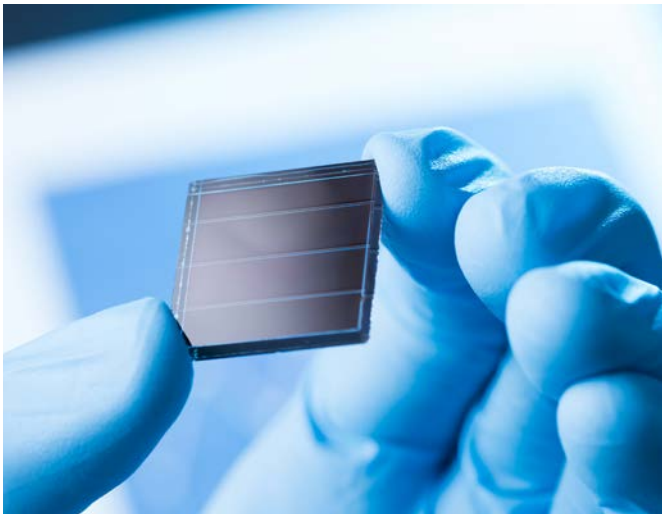
The project will develop a prototype tethered autonomous air vehicle system that will be housed in enclosures atop Sydney Water's elevated reservoirs and potentially on fire trucks used by the NSW Rural Fire Service. Once operational, these vehicles will periodically or on-command ascend to preset altitudes and capture 360-degree video of the surroundings, providing fire agencies with real time visual information from multiple remote locations.

Rapid Microwave Annealing for Ultra-low-cost Perovskite Solar Cells

CASH FUNDING $199,949

PARTNERS Halocell

UNIVERSITY MEMBERS



Sensors are usually powered by batteries which generate toxic waste when disposed. According to the CSIRO, the rate of lithium-ion battery waste in Australia is escalating at an alarming rate of 20 percent annually, yet a mere two percent of the country's lithium-ion battery waste is recycled. Less than five percent of the 264 million alkaline batteries which reach their end of life every year are recycled.

A sustainable solution could use photovoltaic (PV) cells, specifically perovskite PV cells, which have been optimised for indoor lighting and which offer continuous power: ideal for low-power sensors. While cost-effective and suitable for roll-to-roll fabrication, the widespread adoption of PV cells has been slowed by the lengthy annealing time required. This NSSN Grand Challenge project significantly speeds up this process by 300 percent using microwave annealing in roll-to-roll manufacturing, paving the way for large-scale, eco-friendly indoor sensor deployment and eliminating the reliance on disposable batteries.

PAIMCOS Quarantine Monitoring System

CASH FUNDING $184,076

PARTNERS Visicase Pty Ltd

UNIVERSITY MEMBERS

PAIMCOS is a quarantine monitoring system which is activated after testing for COVID-19 and similar viruses. It ensures those who must remain in quarantine to protect themselves and others, are exactly where they should be. This project aims to strengthen PAIMCOS by using machine learning and artificial intelligence to optimise the sequence for fraud prevention, high scalability and protection against cyber-attacks.

Researchers are using advanced AI algorithms to optimise the timing of compliance checks based on the circumstances of each individual user, which minimises the risk of non- compliance and ensures interruption for the users is minimal. Researchers are also using expertise in cybersecurity and data privacy in the project, ensuring the data is collected securely and is permanently destroyed after some time.

Understanding Reception of Care Technology for Healthy Ageing at Home

CASH FUNDING $167,934

PARTNERS Tyree Foundation Institute of Health Engineering, UNSW, Central Coast Research Institute, Central Coast Local Health District, InteliCare Holdings Limited, South Eastern Sydney Local Health District, South Western Sydney Local Health District, Tunstall Healthcare, HammondCare, United For Care, NSW Meals on Wheels, Greater Cities Commission, Medical Technology Association of Australia, Aged Care Industry Information Technology Council, Hills Corporate, Vlepis Pty Ltd, D&M Research Pty Ltd.

UNIVERSITY MEMBERS

UTS THE UNIVERSITY OF NEWCASTLE AUSTRALIA

Australia's ageing population is rapidly increasing and with it, the need to provide quality and sustainable aged care services. Aged care facilities and hospitals lack the adequate resources to meet the growing demand and to provide the expected level of care required. Among its recommendations, the 2021 Royal Commission into Aged Care Quality identified ageing in place as a means for older people to retain a sense of identity and independence. Being in their own space and among their community also has positive effects on people's health and reduces the burden on in-patient services for people who may not need them.

This project aims to find out more about what ageing citizens think about the idea of technology like sensors and robots being installed in their homes to support their ageing in place. It also seeks to know what carers and people's families think about the idea.

Multilingual Language Translator for Natural Hazard Warnings

CASH FUNDING $156,400

PARTNERS VideoTranslator

UNIVERSITY MEMBERS

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

The Australian Warning System is designed to deliver clear and well-understood messages based on extensive experience and research. It covers various hazards, from bushfires to severe weather, and is shared across multiple platforms with dynamic inputs such as social media posts and text messages. These warnings must be created, updated, and published swiftly in response to real-time events. However, since they are written in English, there is a risk that they may not effectively reach all residents, particularly those in Culturally and Linguistically Diverse (CALD) communities, who may have English as a second language.

This project is using AI to translate hazard warnings into various languages, allowing community members to read them in their preferred language. This initiative ensures no one is forgotten in an emergency, due to language barriers.

Translating Healthcare Content Using User-controlled AI

CASH FUNDING $140,333

PARTNERS VideoTranslator

UNIVERSITY MEMBERS

NSW Health has systems in place to support public health staff in delivering services to people from culturally and linguistically diverse (CALD) backgrounds, including multicultural health services and dedicated CALD services at local health districts. However, some districts face challenges due to a high proportion of English as a Second Language (ESL) speakers. This increases the demand for medical interpretation services and poses difficulties in effective and cost-efficient service delivery. There is a significant need for technological solutions to ensure accurate, responsive, and equitable medical information, consultations, treatment, and ongoing management for CALD communities.

This project aims to extend the health interpretive services reach and capacity using AI, especially during after-hours and low-risk consultations. The MediCALD solution allows clinicians to set up two-way and broadcast telehealth consultations, translating in real-time and securely communicating with the electronic medical records system. The project is evaluating the capability in various scenarios, including low-risk consultations without interpreters, on-demand interpreter workflows, and multilingual broadcasts for health awareness.

Improved Operational Flood Intelligence for Western NSW Catchments

CASH FUNDING $128,600

PARTNERS Schematic Intel, NSW SES

UNIVERSITY MEMBERS

In the Western catchments of NSW, flood events can stretch for weeks and months as the flood wave travels downstream. To respond better, emergency services need more data on the pace that flood waters rise and critical flood levels. In addition, uncertainties on this information are also needed on an easily interpretable schematic diagram.

This project provides a proof-of-concept in using machine learning methods to provide extra flood intelligence to the NSW State Emergency Service based on data from a range of sensors. Partnering with industry partner Schematic Intelligence, this data is being built into a live schematic for response planners. Machine learning methods have been implemented in similar cases like this but have seen constrained effectiveness due to the availability of the data to train them. This project is looking carefully at using relevant flood data and incorporating other sources including near real-time optical satellite data.

New Generation of Advanced Fibre Optics for Intelligent Structural Health Monitoring of Bridges

CASH FUNDING $119,652

PARTNERS Transport for NSW

UNIVERSITY MEMBERS

Bridges are vital for economic and social growth, but it is expensive to monitor their structural deterioration. The Australasian Corrosion Association estimates the annual cost of maintaining Australia's bridges is $8 billion. Yet there is an urgent demand for technologies that can accurately provide an assessment of a bridge's condition. Many bridges in Australia are more than 50 years old, requiring regular inspection and maintenance.

This NSSN Grand Challenge project has developed smart fibre optic sensors which can monitor corrosion in concrete structures and help extend the service life of a bridge. The high-performance fibre optics are cost-effective and can check for strain, cracks and corrosion in reinforced concrete bridges. The sensing technology and machine learning models enable accurate and early detection of defects in reinforced concrete bridges using only a single fibre Bragg gratings sensor, reducing the cost and simplifying the data analysis process. The project also tested the fibre optic sensors in a digital model of a concrete bridge.

Detecting Vital Signs Through Sensor Fusion

CASH FUNDING $100,000

PARTNERS Vital Photonics

UNIVERSITY MEMBERS

Corrective Services NSW is seeking non-invasive technology solutions to monitor the vital health signs of inmates in their cells without the use of wearable sensors, routine cell checks or cameras. The data collected will help prevent at-risk inmates committing self-harm.

No sensor can collect all the relevant information, so researchers took a sensor fusion approach, combing optical, infrared and radar sensors. The prototype aimed to use mm-wave radar sensors to measure the respiratory rates, but since these measurements would be complicated by the motion of the person, a low-cost infrared sensor was used to measure broad motions. By subtracting this broad motion from the high-resolution radar measurements, an accurate respiratory rate was able to be extracted. The researchers explored the use of novel photonic-radar capabilities that offered unprecedented accuracies and conducted a study to understand the feasibility of this technology for this application.

Biosensing Technologies for Hive Health Monitoring

CASH FUNDING	$100,000
PARTNERS	LB Agtech

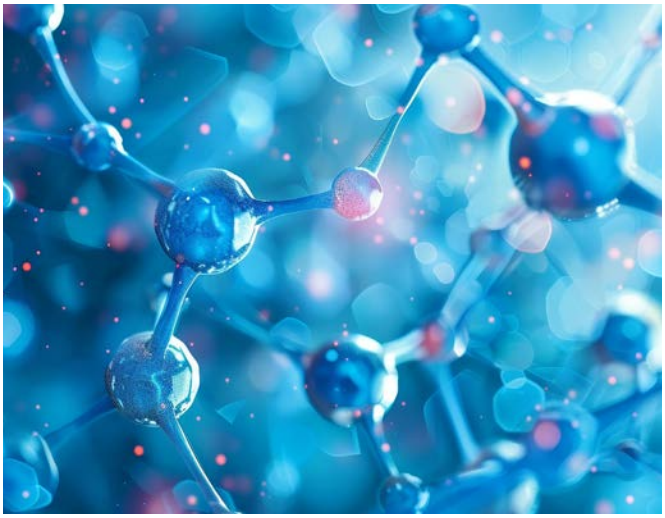
UNIVERSITY MEMBERS

Honeybees are a vital part of the food chain being the most important pollinator insect for a wide range of crops. Beehive monitoring helps to identify threats such as diseases, pests, and environmental stressors, enabling proactive measures to protect bee populations and safeguard ecosystems. This NSSN Grand Challenge project aims to promote sustainable beekeeping practices and foster cleaner agricultural ecosystems, by implementing remote monitoring systems, minimising the need for on-site visits and therefore reducing travel-related carbon emissions. Alongside nanostructured gas sensors for detecting harmful chemicals, the project proposes the integration of advanced data analytics and communication systems to facilitate real-time data analysis, enabling beekeepers to monitor hive health parameters such as temperature, humidity, hive weight, and bee activity patterns.

ARC Research Hub for Molecular Biosensors for Point-of-Use (MOBIUS)

CASH FUNDING	$100,000
PARTNERS	ARC Research Hub MOBIUS

UNIVERSITY MEMBERS



The ARC Research Hub for Molecular Biosensors at Point-of-Use (MOBIUS) aims to accelerate the growth of Australia's emerging biosensing industry. It brings together industry, government and academic experts from diverse fields in Chemistry, Biology, Physics and Engineering, to work on complex problems and generate new commercial opportunities. It also aims to build an ecosystem to train the next generation of biosensor researchers by embedding researchers and students in industry.

The NSSN contributed to the establishment of the research hub by connecting a key industry partner with CI Associate Professor Noushin Nasiri at Macquarie University.

Meaningful Measures in the Home

CASH FUNDING	$100,000
PARTNERS	Hills Health, Hospital in the Home, My Medic Watch, InteliCare, Vlepis, United for Care

UNIVERSITY MEMBERS

UTS

THE UNIVERSITY OF NEWCASTLE AUSTRALIA

As the population of Australians over 65 increases, the current aged care system continues to operate under severe financial stress. Lack of capacity in aged-care facilities is adding pressure to hospitals. Some of this demand could be mitigated through innovative models of home-based care that support older Australians in maintaining their health and independence. To unlock the potential of home-based IoT sensor devices to provide actionable insights that improve care and quality of life whilst reducing healthcare costs, a universally clinically agreed set of 'meaningful measures' is needed. This NSSN Grand Challenge project will identify a subset of meaningful measurements that provide a comprehensive understanding of older people's wellbeing at home. Data collected from intelligent, low-power, wirelessly connected sensor devices deployed in the home or as wearables will collect data such as body position, movement and activity, sleep quality, blood pressure and fatigue levels. These insights will inform personalised care models, enabling proactive interventions preventing significant events and subsequent hospital admission.

OysterGuard: Precision Water Quality Monitoring System to Safeguard Against Oyster Mortality

CASH FUNDING	$99,396
PARTNERS	Oceanfarmr

UNIVERSITY MEMBERS

MACQUARIE University SYDNEY·AUSTRALIA

UNIVERSITY OF WOLLONGONG AUSTRALIA

Climate change is challenging aquaculture in Australia with the increasing threat of unpredictable heat waves, floods, and droughts. Farmers are already losing millions of dollars' worth of crops to extreme weather events.

A state-of-the-art autonomous water quality monitoring system will empower oyster farmers to navigate these challenges. This innovative device detects hazardous water conditions and delivers real-time alerts and comprehensive reports directly to farmers through a user-friendly mobile app. Providing crucial insights, this NSSN Grand Challenge project allows farmers to proactively safeguard their crops. The system's modular design facilitates future enhancements, accommodating additional sensors like temperature, salinity, and turbidity. Importantly, the hardware operates seamlessly for extended periods, sidestepping fouling issues by maintaining a non-continuous contact approach with the water, ensuring a resilient and sustainable solution for aquaculture.

Smart Sonar and Accessible Hydrography

CASH FUNDING $60,000

PARTNERS CEE Hydrosystems

UNIVERSITY MEMBERS

Sonar technology has been well established over many decades to conduct underwater measurements surveys such as measuring riverbed make up for environmental assessment. However, these surveys require extensive training, skills and unwieldy equipment. The industry is also moving towards the usage of autonomous survey vessels (drone-based) to perform sonar measurements, which require more portable and simpler systems for single-person operation. There is a need to develop enhanced manufacturing capabilities of these sonars, and a more automated way to capture and analyse the data.

The solution is to create a single-operator survey vessel built with a custom sonar and integrated software. Collaborating with CEE Hydrosystems, a team of researchers from Macquarie University and the University of Wollongong is leading the path to building custom transducers able to improve the minimum depth measurement and reduce the size, weight and power for drone operation. The project is looking at a new design of a piezo transducer and integrating existing bathymetry software to the drone-based system.

High-Speed Counting of Black Soldier Flies for Optimised Waste Recovery

CASH FUNDING $50,000

PARTNERS ARC EntoTech

UNIVERSITY MEMBERS

The world is generating mixed solid waste (MSW) in volumes far exceeding its capacity to recycle and manage effectively. In Australia, the total volume of MSW generated in 2018 was 67 million tonnes, of which 45.6 million tonnes was buried into landfill.

The use of black solider fly larvae to process MSW provides an environmentally friendly option. However, optimising the breeding process of the flies is yet to be fully developed and there is a key role for smart sensing in measuring fly reproduction behaviour.

This project utilises the world-leading neuromorphic vision capabilities at Western Sydney University. These event-based sensors have shown high-speed counting of targets under difficult imaging conditions. The analysis techniques are being adapated to count flies as they move between different breeding cycles. This data provides clear insights on how the flies are reacting to interventions. The project is also partnering with Macquarie University to deliver the robust hardware that allows the operation of the sensor inside the breeding cages.

OPENAIR: Operational Network of Air Quality Impact Resources - Phase II

CASH FUNDING	$35,000
PARTNERS	NSW Department of Planning & Environment (NSW DPE), 9 Local Governments across NSW

UNIVERSITY MEMBERS

Poor air quality caused by bushfires, wood-fired heaters, agriculture, transportation, industry and urban heat is a significant cause of health problems and premature death in Australian communities. Led by the NSSN, in collaboration with NSW DPE, the award-winning OPENAIR project empowers local councils to combat air pollution through Australia's first common method for using low-cost smart sensors to measure air quality. OPENAIR's Best Practice Guide and free-to-download resources guide councils through collecting and analysing localised data so they can make informed decisions about how to respond to air quality issues. In addition, a first-of-its-kind data sharing system has been developed to enable seamless and open sharing of air quality sensing data, resulting in unprecedented air quality data resolution for our cities and regions. OPENAIR allows all communities to participate in smart cities and towns, reduce carbon impacts and boost wellbeing.

This additional funding supported the transition of the OPENAIR project to the NSW Government website.

Real Time Fuel Moisture Monitoring Using Low-Cost IoT Devices

CASH FUNDING	$32,000
PARTNERS	Indicium Dynamics, Forestry Corporation, ACT Parks and Conservation Service

UNIVERSITY MEMBERS

The identification of suitable windows of opportunity for prescribed burning is an ongoing challenge for fire management agencies who wish to better prepare for fires. Addressing this problem is of growing importance as climate change increases the threat of bushfires and windows of opportunity for prescribed burns may shift in seasonality or narrow in duration. The moisture content of bushfire fuel is a key limitation on bushfire occurrence and on implementing fuel hazard reduction burns. Fire agencies monitor the moisture content of bushfire fuel primarily using direct measurement, which often involves considerable travel time and results in limited point-location data. While there are several solutions to this problem, cost and interpretation are consistent barriers to fire management agencies.

Low-cost devices for bushfire smoke detection have been developed which have temperature and relative humidity sensors that can estimate the moisture content of bushfire fuel. These devices will be trialled as part of this NSSN Grand Challenge project to better understand the challenges to their operational deployment, and how they can complement satellite derived fuel moisture monitoring.

“Just wanted to thank the NSSN for alerting us to the opportunity for a stand at Australian Manufacturing Week. We were successful in getting just one of 6 plinth stands at the event, which will offer our company amazing exposure!”

TIM KANNEGIETER, **GENESYS ELECTRONICS DESIGN**

NSSN Priority Themes

The NSSN priority themes respond to some of the most gripping challenges of our time. Complex challenges that are critical to our environment, health, economy and society and which demand innovative solutions that will impact future generations. As of 1 July 2024 the new research priority themes as laid out in the new strategic plan are:

ENVIRONMENT & AGRICULTURE

Our agricultural sector is critical as it helps to feed an increasing global population, but it can have significant impacts on the environment, including pollution and degradation of soil, as well as positive impacts such as trapping greenhouse gases within crops and soils. At the same time, the UN Environment Programme says the world is facing a triple planetary crisis of climate change, nature and biodiversity loss, and pollution and waste, which is threatening the planet and millions of species.

HUMAN HEALTH

Investing in human health is crucial for creating prosperous, sustainable, and equitable societies where all individuals can thrive and fulfill their potential. Good health practices can help reduce healthcare costs and fosters social cohesion. From wearable sensors that constantly monitor health and wellbeing to handheld biomedical devices that accurately diagnose and track a range of diseases, the way humans manage their health is rapidly changing.

NATURAL HAZARDS

Catastrophic bushfires, floods and storms that have ravaged NSW in recent years have galvanised the need for fresh thinking in how we respond to and live with natural hazards. Climate change will continue to result in more intense, more frequent, more devastating emergency events unless a new approach is taken.

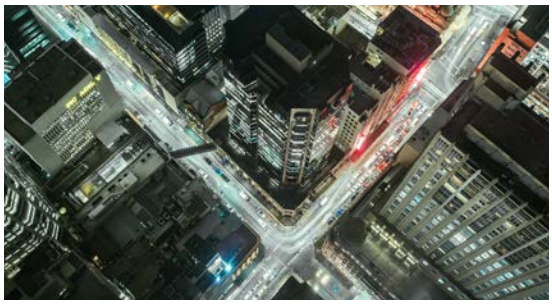
From real-time satellite monitoring to next-generation airborne and ground-based sensor networks, smart sensing holds the key to better natural hazards prevention, response, mitigation and recovery.

NET ZERO

As NSW – and Australia – strive towards a low-carbon economy, the development of clean technologies is critical. Net Zero refers to innovative technologies that improve environmental sustainability but also offer compelling opportunities for economic growth. From renewable energy to circular supply chains, Net Zero innovation will lead to lower emissions, a cleaner environment and power efficiencies.

SMART PLACES

Despite having a large geographical area and modest population Australia is a highly urbanised country with over 86% of the population residing in cities and towns. Australia's population is expected to increase from approximately 26 million to almost 36 million by 2050. The majority of this growth will be accommodated by existing urban places or by new large-scale urban development initiatives such as in Western Sydney and South East Queensland and regional locations.



NSSN Grand Challenge Fund

Since 2021, the NSSN has offered its annual NSSN Grand Challenge Fund to foster collaboration and build a cadre of research programs around the NSSN priority themes.

The priority themes have been selected for the important role smart sensing can play in responding to the issue and where technological innovation holds the promise to change the game.

They have also been selected for the NSSN's unique ability to mobilise the world-class R&D capability across our member universities in partnership with industry and government for practical, impactful outcomes.

Grants of up to $100,000 per project are offered to support innovative, collaborative research projects that partner with industry and government. Grants must be matched or exceeded by associated industry/ government investment.

Applications to the fund are assessed on the following five criteria:

- Significance – how the proposal represents a significant and novel approach to addressing the defined priority. 30%
- Collaboration – how the proposal integrates and fosters genuine collaboration between NSSN member universities. 15%
- Partnership - how the proposal integrates genuine partnership with industry and government partners and responds to a defined industry or government need. 15%
- Governance - how the proposal defines a realistic research plan and the measures that will ensure delivery on milestones. 15%
- Impact pathway - how the proposal defines a pathway to subsequent funding, commercialisation and/or operationalisation. 15%
- Diversity - how the proposal champions diversity in the team or addresses diversity as an issue. 10%

The fund enables researchers to team up with industry and government partners to develop innovative solutions to NSSN Grand Challenges.

The Fund is offered in November each year, with applications closing in February of the following year.

NSSN Business Development Program

One of the ways in which the NSSN delivers financial return on investment to its members is through its business development program. Drawing upon its large network of government and industry partnerships and contacts, the NSSN serves as a broker matching client smart sensing demand with member university research expertise to activate collaborative R&D projects.

The NSSN also invests significant effort into identifying and leveraging relevant Commonwealth and state government R&D grants to further support collaborative projects.

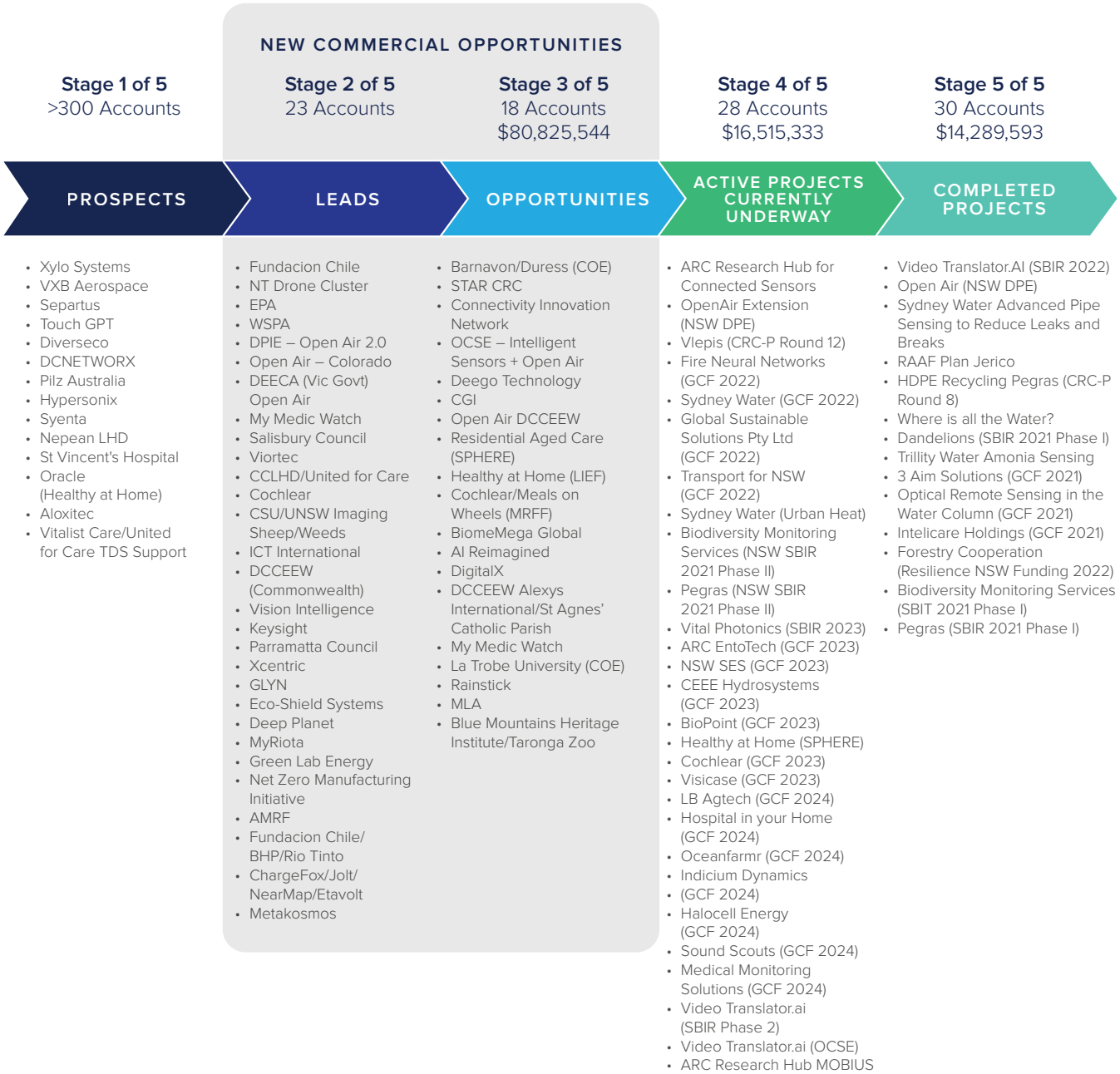
In FY23/24, the NSSN attracted **$2,648,942** in cash across **15 research projects.**

PROJECT	CLIENT	CASH FUNDING
Circular Precincts in the Hunter	Hunter Joint Organisation	$868,000
Translating Healthcare Content Using User-controlled AI (NSW SBIR 2022 Phase II – CALD Challenge)	VideoTranslator.ai	$749,883
Healthy at Home (SPHERE)	Multiple Partners	$167,934
Multilingual Emergency Warnings (OCSE Natural Hazards Technology Program)	VideoTranslator.ai	$156,400
Photonic-enhanced Radar Sensor for Vital Sign Monitoring (NSW SBIR 2022 Phase I – Vital Sign Monitoring Challenge)	Ericom and DigitalX	$100,000
SOUND-BITES Program: Integrating hearing checks & education on hearing loss & hearing sensing technologies within Meals on Wheels Services (NSSN Grand Challenge Fund)	Sound Scouts, Cochlear, Meals on Wheels	$100,000
Revolutionising Indoor Sensor Power: Rapid Microwave Annealing for ultra-low-cost Perovskite Solar Cells (NSSN GCF)	Halocell Energy Limited	$100,000
A new sensor-based monitoring system for the early detection and improved management of heart failure (NSSN GCF)	Medical Monitoring Solutions	$100,000
Translating Healthcare Content Using User-controlled AI (NSW SBIR 2022 Phase II – CALD Challenge)	VideoTranslator.ai	$96,897
Biosensing Technologies for Hive Health Monitoring (NSSN Grand Challenge Fund)	LB Agtech Holdings	$50,000
OysterGuard: Precision Water Quality Monitoring System to Safeguard Against Oyster Mortality (NSSN Grand Challenge Fund)	OceanFarmr Pty Ltd	$49,698
OPENAIR Phase II	NSW Department of Planning, Housing & Infrastructure	$35,000
Meaningful Measures in the Home (NSSN Grand Challenge Fund)	Hospital In Your Home, My Medic Watch, Intelicare Holdings Ltd, Vlepis, Hills, United for Care	$30,530
Natural Hazards Detection System – Phase I	NSW Office of the Chief Scientist & Engineer	$28,600
Real time fuel moisture monitoring using low-cost Internet of Things devices (NSSN Grand Challenge Fund)	Indicium Dynamics, Forestry Corporation of NSW, ACT Parks & Conservation Service	$16,000

More information on each of the above-listed projects can be found on the projects page of the NSSN website.

NSSN Business Development Pipeline

The NSSN tracks its business development activities through its business development pipeline, which maps partnerships from lead stage through to active stage and on to completion. The figure below shows the NSSN Business Development Pipeline as of 30 June 2024.



“I would like to personally thank you for the help, this would have not been possible without your coordination and help!”

PROFESSOR GAETANO GARGIULO, **WESTERN SYDNEY UNIVERSITY**

NSSN Industry Engagement Program

Throughout the year, the NSSN hosts events that activate the smart sensing ecosystem and bring together stakeholders from across industry, government and universities. In FY23/24 the NSSN hosted 16 events across NSW and the ACT.

EVENT	DATE	LOCATION
X-Prize Wildfire Challenge NSSN Briefing	July 2023	Virtual
NSSN Sensing Industry Connect	August 2023	University of Sydney
NSSN table at AmCham Luncheon with Minister for Industry & Science, the Hon. Ed Husic	August 2023	Sydney
Joint CIN-NSSN NSW Regional Connectivity Symposium	September 2023	Lismore
NSSN Textile Circularity Workshop	October 2023	University of Newcastle
NSSN Sensing Industry Connect	November 2023	UTS
STAR CRC Industry Workshop	November 2023	University of Sydney
CADRE OCE CBRN Workshop	November 2023	UNSW
NSSN Sensing Industry Connect	February 2024	UNSW
NSSN Sensing the West Forum	March 2024	WSU Parramatta
Product Development 101 Workshop	April 2024	UNSW
NSSN Sensing Industry Connect	May 2024	CSU Bathurst
NSSN Women in Sensing Forum	May 2024	University of Wollongong
NSW Natural Hazards Detection System (NHDS) Stakeholder Workshop (Floods)	June 2024	Virtual
NSW NHDS System Stakeholder Workshop (Bushfires)	June 2024	Virtual
NSSN Ageing Taskforce VII	June 2024	UTS

Highlights of the year include the **NSSN Sensing the West Forum** hosted at Western Sydney University's Parramatta city campus in March 2024. The event brought together over 100 stakeholders from across the smart cities, planning, construction and property development sectors to explore smart sensing opportunities as part of greenfield Western Sydney developments like Bradfield and the Aerotropolis. Minister for Innovation, Science & Technology, the Hon. Anoulack Chanthivong opened the forum. The co-design workshop produced 13 transformational ideas that the NSSN is progressing towards collaborative R&D projects.




Images from the NSSN Sensing the West Forum, WSU Parramatta, March 2024.

Following on from the success of the NSSN Innovation in the Circular Economy Conference in 2022, the NSSN returned to Newcastle to host the **Textile Circularity Workshop**. The co-design workshop brought together leaders and policymakers in the hospital waste sector to map out the barriers and opportunities to introducing circularity to the textile waste generated by hospitals and the role of smart sensing to solving the problem.



Images from the NSSN Textile Circularity Workshop, University of Newcastle, October 2023.

Popular ongoing NSSN event series continued throughout FY23/24, with the **NSSN Women in Sensing Forum** series and the popular **NSSN Sensing Industry Connect** series revolving around the membership.

Images from NSSN Women in Sensing Forum, University of Wollongong, May 2024

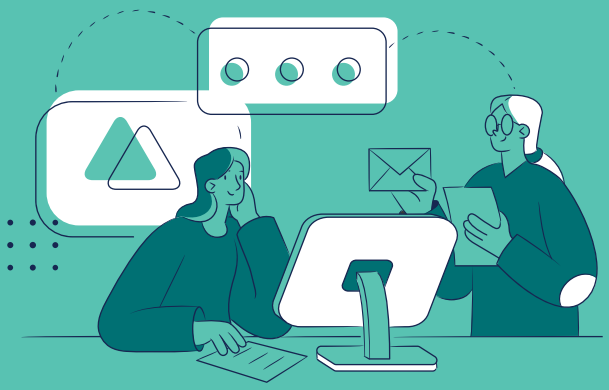
Images from NSSN Sensing Industry Connect events at UTS (November 2023), UNSW (February 2024) and CSU Bathurst (May 2024).

Throughout the year, members of the NSSN team participate in a vibrant calendar of events across the NSW and the Australian innovation ecosystem. In FY23/24, members of the NSSN team spoke at, exhibited at and/or attended dozens of conferences, workshops and seminars.

NSSN Public Outreach Program

82

MENTIONS ACROSS PRINT, ONLINE AND BROADCAST MEDIA



2,724

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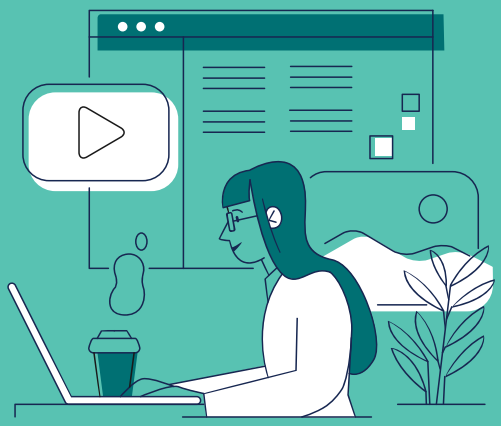

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