Australia-Vietnam Strategic Technologies Centre

Supported by Australian Government and Government of Vietnam

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Website

The Australia-Vietnam Strategic Technologies Centre (AVST), supported by the Australian Government (via Department of Foreign Affairs and Trade) and Vietnam Government (via Ministry of Science and Technology), aims to strengthen collaboration between the two nations in strategic technologies with cutting-edge research/facilities.
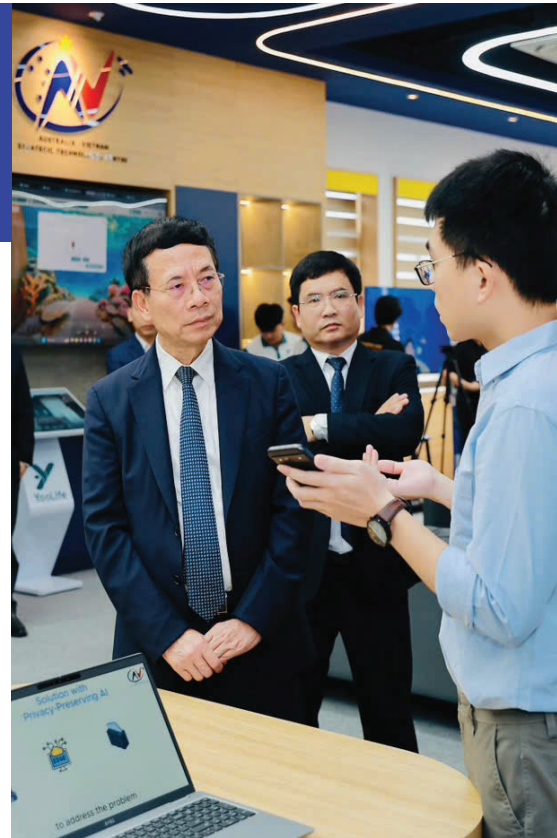
- **Economic Impact:** Nokia projects that 5G and 5G-Advanced technologies could contribute up to $8 trillion in global GDP by 2030, opening new revenue streams for both Vietnam and Australia, e.g., in creative industry, science-empowered innovation and sustainable growth.

- **Initiatives:**
  - Establishment of the AVST with state-of-the-art research labs; serving as a testbed for future technologies, providing a controlled environment to trial and optimize 5G applications.
  - Addressing challenges such as cybersecurity, energy efficiency, resilient digital infrastructure.
  - Provision of strategic technology seed funding and scholarships.
  - Implementation of a women-in-technology mentorship program.
  - Development of new 5G and 5G Advanced use cases

AVST brings together world-leading experts, researchers, and industry pioneers to explore cutting-edge advancements in technologies, e.g., 5G/6G, AI, cybersecurity, quantum, and other emerging technologies. Through insightful discussions and interactive sessions, participants will gain valuable hands-on experience and perspectives on how these transformative technologies can enhance global connectivity, foster cross-border innovation, and drive sustainable and secure digital transformation for Australia, Vietnam, and the world.

- **Hands-On Industry Training:** Gain practical experience with cutting-edge 5G equipment provided by Nokia, our key industry partner.
- **PhD Training & Networking:** Discover research opportunities and engage in discussions with world-leading professors and experts in strategic technologies like 5G/6G, AI, and Cybersecurity.

- **GEDSI Awareness:** Explore the crucial role of Gender Equality, Disability, and Social Inclusion (GEDSI) in research, technology development, and modern society.
- **AVST scholarships and travel allowance to outstanding applicants**
- **Women in Technology & Innovation Awards**
- **5G/6G use case, demos, research exhibition**
- **Technology transfer, training workshops**

Labs

■ Intelligently Connected Networks Lab

This laboratory strives to cultivate a collaborative research environment that fosters connections among researchers and co-labs. Our central mission is to explore cutting-edge advancements in intelligent connected networking, particularly addressing performance and security challenges in edge computing. We focus on developing performance-enhancing strategies by exploiting the potential of new wireless communication solutions and technologies alongside breakthroughs in edge intelligence. Otherwise, our research delves into the complexities of IoT authentication and integrity issues, anomaly detection, and the intrusion detection system design for resource-constrained devices at the network edge. The biggest challenge lies in orchestrating intelligent interactions among diverse devices within a decentralized framework. This focus on intelligent decision-making in a decentralized environment necessitates meticulous attention from our research group in the long term.

This laboratory strives to cultivate a collaborative research environment that fosters connections among researchers and co-labs. Our central mission is to explore cutting-edge advancements in intelligent connected networking, particularly addressing performance and security challenges in edge computing.

Can You Control a Robot Without Crashing?
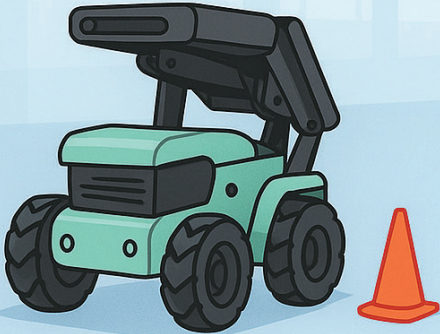
3G Crashes Ahead	4G Better But Risky	5G Smooth & Safe Control
✕	⚠️	✓
High video delay	Reduced delay	Low latency
Too slow to react	Need fast reflexes	Real-time feedback
Robot crashes into obstacles	Near collisions	No crashes

🔍 Why It Matters

5G enables safe, responsive, remote robotics

Industrial Robotics   Autonomous Vehicles   Healthcare

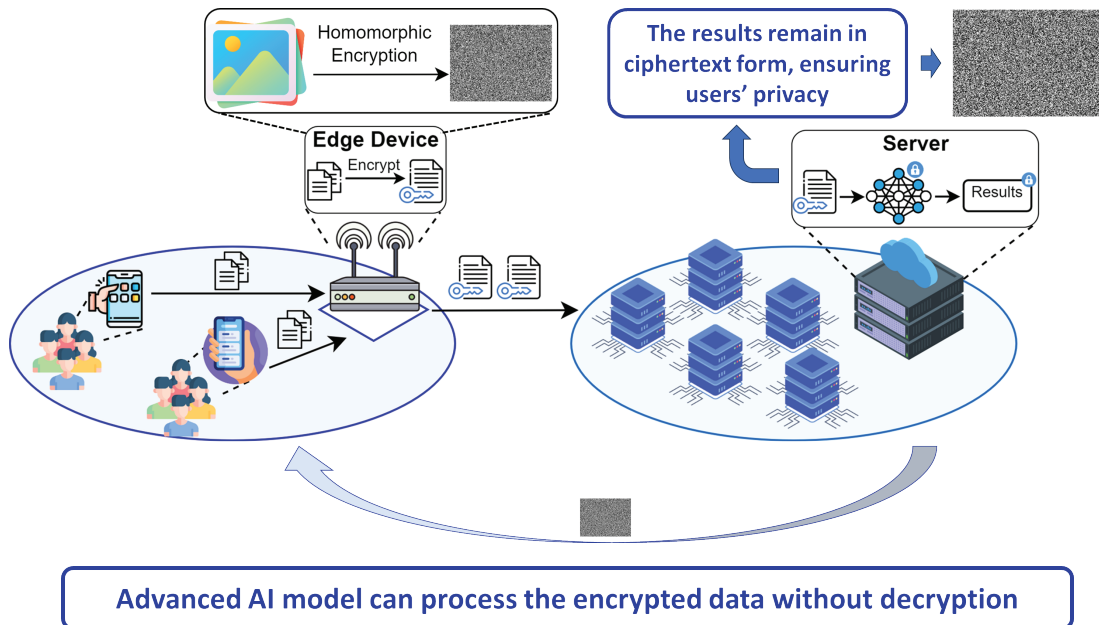## ■ Cutting-Edge 5G Lab: Powering the Future of Innovation

Cutting-Edge 5G Lab: Powering the Future of Innovation

A state-of-the-art 5G laboratory has been fully deployed and set up at PTIT, marking a significant leap forward in next-generation connectivity research and real-world applications. This advanced facility is equipped with cutting-edge 5G technology, enabling researchers, students, and industry partners to explore, test, and develop innovative solutions that will shape the digital landscape of tomorrow.

The comprehensive 5G solution includes:

- 5G Indoor BTS — Delivering ultra-fast, low-latency connectivity for real-time applications.
- 5G Edge-Core — Enabling edge computing for high-speed data processing at the network's edge.
- Transport Infrastructure — Supporting seamless Internet and Intranet connectivity for scalable experiments.
- Industrial 5G Handheld Devices — Offering real-world testing platforms for 5G-powered applications.
- Industrial 5G Router — Facilitating robust, mission-critical industrial networking solutions.
- State of the art SDRs.

The lab will feature next-gen applications, including NTC (Nokia Teams Comm), NDT (Nokia Digital Twins), and MXIE (Mission Critical Industrial Edge), showcasing the vast capabilities of 5G in smart industries, digital collaboration, and critical infrastructure management.

Advanced AI model can process the encrypted data without decryption

■ 5G/6G Wireless Communications and IoT Networking Lab: Pioneering the Future of Intelligent Connectivity

The 5G/6G Wireless Communications and IoT Networking Lab is at the cutting edge of next-generation wireless innovation, driving breakthroughs in AI-empowered communications, democratized cyberinfrastructure, immersive metaverse experiences, and non-terrestrial networks (NTN). Our mission is to revolutionize ultra-reliable, low-latency, and massive-scale connectivity by developing intelligent network architectures that seamlessly integrate V2X, drone communications, and dynamic spectrum-sharing mechanisms. With a focus on real-world impact, we analyze how emerging technologies and services will transform industries, cities, and global communication ecosystems.

Our research extends across the entire wireless stack, from physical (PHY) and medium access control (MAC) layers to network (NET) and application layers, tackling challenges such as multi-radio access technology coexistence, real-time spectrum mapping, interference mitigation, and economics-driven spectrum auctioning. By harnessing Generative AI, we push the boundaries of 5G/6G capabilities, enabling AI-driven edge network architectures, adaptive radio environments, and next-gen immersive experiences. We explore how GenAI can generate, optimize, and enhance content delivery, while also addressing the security implications of AI-powered cyber threats, including deepfake manipulation, AI-driven phishing, and adversarial attacks on network defenses.

By combining AI, IoT, and wireless networking, our lab is redefining the future of intelligent, self-optimizing, and secure communication systems. Whether it's autonomous spectrum management, resilient NTN networks, or metaverse-ready ultra-low-latency architectures, we are pioneering the foundation for the next era of digital transformation.

These cutting-edge 5G labs are more than just research facilities – they are a launchpad for innovation, empowering Vietnam and Australia to lead the way in 5G connectivity, cybersecurity, and digital transformation.

Key Objectives

Privacy-Preserving Large Language Model in AI Services

Privacy-Aware Diagnostic Support in Healthcare Systems
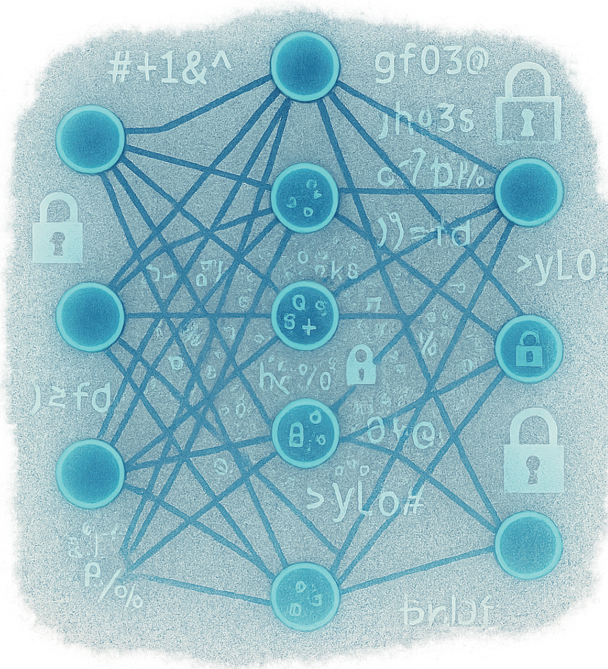
Secure deployment of private 5G edge computing

Secure Collaboration in edge-based industrial 4.0 services

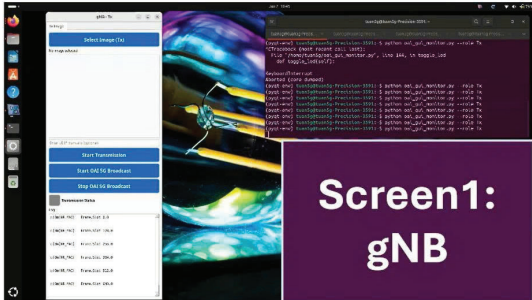# Advanced AI model using Homomorphic Encryption

Efficient process encrypted data without decryption
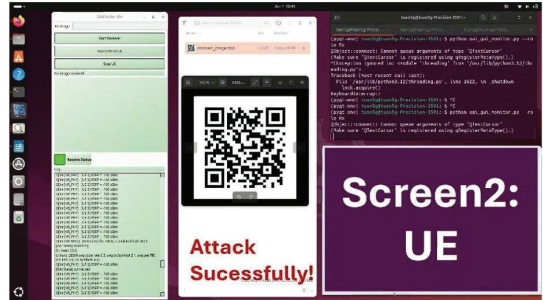
Constructed using Homomorphic Encryption

Quantum attack resistance

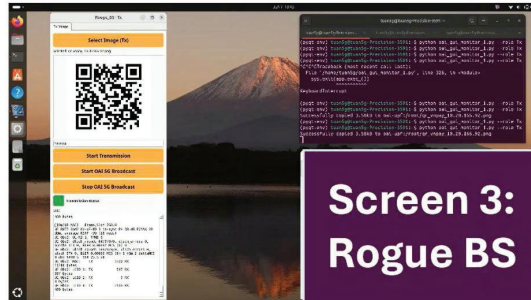## Full Screens: Realtime Demo

Screen1: gNB

Session 2: gNB still searching but **cannot reconnect** to UE

Screen2: UE

Attack Sucessfully!

Rouge BS persistenly performs **signal hijacking!**

Screen 3: Rogue BS

VISITORS AND SCIENTISTS

Visitors

Professor Andrew Parfitt
Vice Chancellor of the University of Technology Sydney

Andrew Parfitt is the Vice-Chancellor and President of the University of Technology Sydney. He joined UTS in February 2017 as the university's Provost and Senior Vice-President before being appointed Vice-Chancellor in November 2021. Previously Andrew was Deputy Vice-Chancellor (Academic) at the University of Newcastle. He has also held senior leadership roles at the University of South Australia and the CSIRO. Andrew has had a distinguished career as an educator and researcher in telecommunications engineering, specialising in antennas and radio systems and has made contributions to satellite communications, radio astronomy technologies and space engineering. Andrew has published more than 100 technical papers in refereed conferences and journals.

Andrew has been a member of many government, professional and industry boards and committees, including:

- Director and Chair of the Universities Admissions Centre (NSW)
- Co-Chair and Member of the SILC UTS/Shanghai University Business School Joint Management Committee
- Chair of the South Australia and NSW Sections of the IEEE
- Chair of the Australian Academy of Science National Committee for Radio Science
- Ministerial Appointment to the Australian Government's Space Industry Innovation Council
- Co-chair of the Asia Pacific Regional Space Agencies Forum
- Director of the Defence Teaming Centre, SA
- Director of the Technology Industry Association, SA
- Member of the Sydney School of Entrepreneurship (Academic Committee)
- Member of the South Australian Defence Reserves Support Council
- Member of the Initial Teacher Education Committee, Board of Studies, Teaching and Education Standards (BOSTES) in NSW, and
- Member of the advisory committee of the Australian Institute of Teaching and School Leadership (AITSL).

Andrew is a Fellow of the Australian Academy of Technology and Engineering, a Fellow of Engineers Australia, a Fellow of the Royal Society of NSW, a Senior Member of the Institute of Electrical and Electronics Engineers and a Graduate of the Australian Institute of Company Directors. He has previously held adjunct academic appointments at Adelaide, Sydney and Macquarie Universities.

Andrew holds a PhD in Electrical and Electronic Engineering and a Bachelor of Engineering (Honours) from the University of Adelaide.

Visitors

Professor Ray Owen
University of Technology Sydney (UTS), Australia

Ray Owen is a leading expert in network resilience, telecommunications infrastructure, and digital modelling, with over 30 years of experience spanning industry, research, and governance. He earned his PhD in Electrical and Electronic Engineering from the University of Birmingham (UK) in 1995, where his research focused on Modelling HighFrequency Acoustic Scattering from a Rough Surface, and holds a Bachelor of Engineering (Electrical and Electronic) from King's College London, completed in 1992.

Currently, Ray serves as an Industry Professor at the Faculty of Engineering and IT at the University of Technology Sydney (UTS) as well as the lead in the UTS telecom research unit with contracts spanning NBN, Telstra and the federal government. His research and commercial expertise encompass telecommunications resilience, fixedline networks, wireless networking, and network modelling. He is also the Director of the Australian National Telecommunications Resilience Centre, where he leads efforts to enhance the robustness of national and global telecom infrastructures.

In addition to his academic role, Professor Owen is a equity partner at Tech Audit Partners, a U.S.based consultancy specializing in network resilience and audits for governments and enterprises. He also provides highlevel consultancy on network outages, their causes, and recovery strategies for major management consulting firms.

Previously, as General Director of Motorola Vietnam (20062010), he worked closely with VNPT, Viettel, and other key stakeholders to modernize and expand Vietnam's telecommunications sector. His industry leadership continued most recently as Chief Technology Officer of NBN Australia (20182023), where he led the evolution of national broadband network for all Australians.

Visitors

Professor Symeon Chatzinotas
Luxembourg University, Luxembourg

Symeon Chatzinotas (MEng, MSc, PhD, FIEEE) is currently Full Professor/ Chief Scientist I and Head of the research group SIGCOM in the Interdisciplinary Centre for Security, Reliability and Trust, University of Luxembourg. In parallel, he is an Adjunct Professor in the Department of Electronic Systems, Norwegian University of Science and Technology, an Eminent Scholar of the Kyung Hee University, Korea and a Collaborating Scholar of the Institute of Informatics & Telecommunications, National Center for Scientific Research "Demokritos".

In the past, he has been a Visiting Professor at EPFL, Switzerland and University of Parma, Italy and contributed in numerous R&D projects for the Institute of Telematics and Informatics, Center of Research and Technology Hellas and Mobile Communications Research Group, Center of Communication Systems Research, University of Surrey.

He has received the M.Eng. in Telecommunications from Aristotle University of Thessaloniki, Greece and the M.Sc. and Ph.D. in Electronic Engineering from University of Surrey, UK in 2003, 2006 and 2009 respectively.

He has authored more than 800 technical papers in referred international journals, conferences and scientific books and has received numerous awards and recognitions, including the IEEE Fellowship and an IEEE Distinguished Contributions Award. He has served in the editorial board of npj Wireless Technology, IEEE Transactions on Communications, IEEE Open Journal of Vehicular Technology and the International Journal of Satellite Communications and Networking.

Mr Ray Tseng
Head of Enterprise Campus Edge (ECE) Sales APAC, Nokia

Ray Tseng is the Head of Asia Pacific Sales for Enterprise Campus Edge at Nokia. With 30 years of experience in technology B2B sales and market development, Ray has driven digital transformation across the industrial sector. His career spans leadership roles in private networks, telecommunications, cloud, and IoT solutions, with a strong focus across the Asia Pacific markets. As a strategic business leader, Ray is leading the growth initiatives for Nokia ECE, specializing in industrial use cases for mining, transportation, energy, and manufacturing. He is passionate about bridging cultural divides between East and West, leveraging his expertise in sales leadership, strategic partnerships, and market expansion. Ray holds an Electrical & Computer Engineering degree from Carnegie Mellon University and an MBA from Hong Kong University.

Visitors

Professor Karu Esselle
University of Technology Sydney (UTS), Australia

Karu Essell¬e, FRSN, FIEEE, FIEAust, is Distinguished Professor in Electromagnetic and Antenna Engineering at University of Technology Sydney (UTS). He is Australia's 2022 Professional Engineer of the Year, and the leader of the MetaSteerers Team that won Australia's national 2023 Eureka Prize for Outstanding Science in Safeguarding Australia, making him the only person to receive both a Eureka Prize and the Professional Engineer of the Year Award. Last year he also received the 2024 Premier's Prize for Leadership in Innovation in NSW.

Karu is a Fellow of the Royal Society of New South Wales, IEEE and Engineers Australia. His large collection of recent awards include the most prestigious Space award in Australia – the "Winner of Winners" Excellence Award – as well as the Academic of Year Award at the 2022 Australian Space Awards, 2022 UTS Chancellor's Medal, both the Excellence Award and the Academic of the Year Award at 2021 Australian Defence Industry Awards, and 2019 Motohisa Kanda Award (from IEEE USA) for the most cited paper in IEEE Transactions on EMC in the past five years.

Karu has authored over 750 research publications, and his papers have been cited about 17,000 times. His h-index is 64. Since 2002, his research income is over 35 million dollars. Karu has provided expert assistance to more than a dozen companies in USA, Europe and Australia. From 2018 to 2020, Karu chaired the Distinguished Lecturer Program Committee of the IEEE Antennas and Propagation (AP) Society, and has served in 8 global committees of this IEEE society. In addition, Karu has been a Senior Editor of IEEE Access and an Associate Editor of many international journals including IEEE Transactions on Antennas Propagation, IEEE Antennas and Propagation Magazine, IEEE Access and IET MAP. He was Director of WiMed Research Centre and Associate Dean – Higher Degree Research (HDR) at Macquarie University. He has also served as a member of the Dean's Advisory Council and the Division Executive. Karu is a Director of Innovations for Humanity Pty Ltd. Karu's research activities are posted in the web at https://www.uts.edu.au/staff/karu.esselle and https://en.wikipedia.org/wiki/Karu_Esselle.

Visitors

Prof. Marian-Andrei Rizoiu
University of Technology Sydney (UTS), Australia

Marian-Andrei Rizoiu is an Associate Professor leading the Behavioral Data Science lab at the University of Technology Sydney. His interdisciplinary research crosses computer and social sciences, blending psycholinguistics, digital communication and stochastic modelling to understand human attention dynamics in the online environment, the emergence of influence and opinion polarization. Dr Rizoiu is the recipient of the prestigious Excellence Award and Academic of the Year at the 2023 Australian Defence Industry Awards. He currently leads grants worth $1.8 million from the Commonwealth of Australia to detect and model the spread of mis- and disinformation and its weaponized counterparts – information and influence operations.

Dr Rizoiu's research has made several key contributions to online popularity prediction, real-time tracking and countering disinformation campaigns, and understanding shortages and mismatches in labour markets. First, he developed theoretical models for online information diffusion, which can account for complex social phenomena. His models answer questions such as "Why did X become popular, but not Y?" and "How can problematic content be detected based solely on how it spreads?". Second, he built skill-based real-time occupation transition recommender systems. These systems link social media-predicted personality profiles with occupation skill requirements to construct personalized career recommendations. His recommender systems answer questions like "Are some jobs better suited to one's personality?" and "Can one be happier and more engaged with a job aligned with their personality?". Individuals can use these recommender systems to ask: "What jobs can I readily perform based on my current skills?" and "What skills should I acquire to transition to a new job?"

Marian-Andrei's research receives funding from selective funders such as Meta (Facebook) Research, Defence Science and Technology Group (DSTG), The Department of Home Affairs and the Defence Innovation Network. In addition, he publishes in the most selective venues, such as the PNAS, PLOS ONE, PLOS Computations Biology, WWW, NeurIPS, IJCAI, and CIKM. As a result, his work has received significant media attention—including Bloomberg Business Week, Nature Index, BBC, and World Economic Forum.

Marian-Andrei disseminates his research to the broader public by regularly contributing to The Conversation. In addition, he also leverages his research to real societal impact by, for example, serving as an expert for the NSW government's Defamation Law Reform or providing evidence for the Australian Federal Senate inquiry into media diversity.

Visitors

Professor Stuart Perry
University of Technology Sydney (UTS), Australia

Stuart Perry has over 20 years of experience conducting research into image processing, virtual reality, psychophysics, signal processing, image quality, and models for the quantification of image preference and aesthetics for both government, industry and academia. From 2003 to 2016, he worked for Canon Information Systems Research Australia (CiSRA), a Canon group company and one of the Canon Group's largest R&D facilities outside of Japan. During this time, he worked on camera white balancing technologies, and led research teams working on print quality measurement, document security and perceptual quality measurement for various consumer devices. In 2016 he joined the FEIT's Perceptual Imaging Laboratory (PILab) as Co-Director conducting research into colour and perceptual quality in 3D environments. Stuart also represents PILab and UTS on a number of international standards committees such as ISO/TC42 (Photographic standards), ISO/SC29/WG7 (MPEG) and ISO/SC29/WG1 (JPEG) where he leads JPEG's activity on point cloud coding standards and an editor for the upcoming ISO/IEC international standard on learning-based point cloud compression as well as co-chair of JPEG's Radiance Field study group. He is also a member of SPINet and a Senior Member of IEEE. He is interested in point cloud and light field technologies, computer vision, 3D scanning and human perception in Virtual, Augmented and Mixed Reality environments. He is the author of over 60 professional and academic publications including 2 books and 20 patents and patent applications and is an associate editor of the SPIE/IS&T Journal of Electronic Imaging.

Professor Michael Bremner
University of Technology Sydney (UTS), Australia

Prof. Michael Bremner, Director of the Centre for Quantum Software and Information at UTS and work package leader, node manager, and program manager in the ARC Centre for Quantum Computation and Communication Technology, is a leader in the Australian quantum ecosystem and one of the most recognised global names in theoretical quantum computing. Prof. Bremner is widely known for pioneering the core algorithms that define what is now known as quantum supremacy. This work led to Google's demonstration of the first quantum computation that was intractable for classical computers. As a leader in Australia's quantum technology ecosystem, he has championed the need for diversity in backgrounds, experiences, and skills if Australia is to stay at the forefront of quantum technologies. He is a board member and helped establish the Sydney Quantum Academy where he has co-developed programs that have led to talent creation, industry engagement, and research excellence. Other leadership roles include membership on the advisory board for Transport for NSW's efforts in quantum computing, co-editor in Chief of the Nature Partner Journal: Quantum Information, member of the Quantum Australia Growth Centre consortium committee, co-founding the Australian Quantum Software Network, and advising for the NSW Chief Scientist and Engineer. His impactful research has led to significant industry engagement as a performer on the DARPA Quantum Benchmarking program, recipient of funding through Google's Digital Future Initiative, and the ASCA Emerging Disruptive Technologies program.

Scientists

Professor Eryk Dutkiewicz
University of Technology Sydney (UTS), Australia

Professor Eryk Dutkiewicz is the Associate Dean International in the Faculty of Engineering and Information Technology. Previsouly, from 2015 to 2024, he was the Head of School of Electrical and Data Engineer at University of Technology Sydney. He began his research career in 1988 at the Research Laboratories of Overseas Telecommunications Corporation in Sydney. In the 1990s, while at OTC, Telstra and at University of Wollongong he conducted Research and Development into wired, wireless and mobile technologies. In 1999, he joined Motorola where he managed wireless research activities at Motorola Labs in Sydney. During that period he participated and contributed to the fast-developing IEEE WiFi standards. From 2004 to 2008 he worked at University of Wollongong as a Professorial Fellow leading a wireless research activity into broadband wireless networks and wireless sensor networks. From 2008 to 2015 he worked at Macquarie University where he was the Director of the Macquarie University WiMed Research Centre developing wireless technologies for medical applications. In November 2015 he joined University of Technology Sydney as the Head of School of Electrical and Data Engineering.

Professor Eryk Dutkiewicz has worked with many industry partners, including Motorola, Freescale Semiconductor, Agere Systems, Zarlink, Mircosemi, Infineon, Intel and Nokia. He has been the Principle Investigator on many industry and government-funded projects over the last 30 years. Some of his recent industry-funded projects include projects funded by Intel Corporation to develop 5G technologies. In the last few years he has led several government-funded projects sponsored by the Department of Foreign Affairs and Trade. These include "UTS Rapido Vietnam: Water Systems with Industry 4.0 Technology Implementation to Enable Sustainable Communities in Red River Delta and Phu Yen", "Digital transformation for management of disaster responses, search, and rescue in Vietnam", and "Unleashing Opportunities in Vietnam Innovation Ecosystem for Technology-based SMEs".

His current research interests include 6G communications and Internet of Things systems and networks. He has strong collaboration links within wireless industry and with premier research institutions in Europe and Asia. He was a member of an ASEAN project on "Cybersecurity and Information Security in Industry 4.0". He was the Co-Director of the UTS-Vietnam National University Joint Research Centres in Hanoi and in Ho Chi Minh City, Vietnam. He holds a co-joint Professor appointment at Hokkaido University in Japan. He is a co-author of over 400 publications and 19 patent filings.

Scientists

Professor Diep N. Nguyen
University of Technology Sydney (UTS), Australia

Diep N. Nguyen is currently a faculty member, Director of Agile Communications and Computing group, the Faculty of Engineering and Information Technology, University of Technology Sydney (UTS), Australia and holding adjunct positions at other universities in US, Vietnam, Japan. He received M.E. and Ph.D. in Electrical and Computer Engineering from the University of California San Diego (UCSD) and The University of Arizona (UA), respectively.

His recent research interests are in the areas of computer networking, mobile computing, cyber security, wireless communications (5G/6G), and machine learning/AI application, with emphasis on systems' performance security/privacy. His work, appeared in more than 200 journal and conference papers, 5 filed patents, 7 technical reports, 5 book chapters, 7 books (published and in production), has attracted more than $7 millions of funding from US National Science Foundation, Raytheon Missile Systems, Australian Research Council, Australia Department of Foreign Affairs and Trade (DFAT), Intel, US Air Force Research Lab, Australia's Defence Science and Technology Group (DSTG). Dr. Nguyen also contributed to the founding of Food Agility CRC, a $150 million initiative with 30 private sector, government, and research partners to empower Australia's food industry through digital transformation.

He has supervised/mentored to completion 15 PhDs who are working as academics and holding senior industry positions in Australia, US, Europe, China, Vietnam and Indonesia (e.g., Samsung, Qualcomm, Imperial College of London, Monash University, UNSW, Huawei).

Before the current position, he was a DECRA Research Fellow, a member of technical staff at Broadcom (California), ARCON Corporation (Boston), consulting on fast detection of UAVs/aircrafts, air traffic control for FAA. He has received several awards from Australian Research Council, US National Science Foundation, University of Technology Sydney, LG Electronics, University of California San Diego, The University of Arizona, including the iAward by Australian Information Industry Association (2024), IoT Award by Australian IoT Alliance (2024), the UTS Vice-Chancellor's Awards for Research Excellence (2021, 2025), Discovery Early Career Researcher Award (DECRA, 2015), outstanding Early Career Researcher Award (2018, School of Electrical and Data Engineering, University of Technology Sydney). He co-founded and serves as a member of the executive board of UTS Joint Technology and Innovation Research Centers that foster research/technology exchange and collaboration of mutual interest between UTS and its partners (e.g., 5G/6G, IoT, cybersecurity, AI, industry 4.0, environmental engineering, sea monitoring systems). Dr. Nguyen also served in the International Advisory Board for Asia-Pacific Economic Cooperation (APEC) DARE (Data Analytics Raising Employment, proposing economy: United States, Department of Labor).

He has co-organized several IEEE and international conferences (e.g., IEEE VTC, INFOCOM, ISMICT, ISCIT, BODYNETS) as TPC chairs, co-chairs, track, session chairs. He has been invited to give keynotes, invited talks, and serve in the TPC committees of various IEEE and international annual flagship conferences, e.g., IEEE LANMAN, ICC, Globecom, WCNC. Dr. Nguyen is a Senior Member of IEEE and has served on the Editorial Boards of IEEE Communications Surveys & Tutorials (COMST), IEEE Transactions on Mobile Computing (TMC), IEEE Access, IEEE Open Journal of the Communications Society (OJ-COMS), Sensors journal, and Scientific Reports (Nature's).

Scientists

Professor Cuong Pham
PTIT

I am an Associate Professor of Computer Science at Posts and Telecommunications Institute of Technology (PTIT) and a Research Scientist at Qualcomm AI Research (acquiring VinAI's Research division since April 2025). I am also the Dean of Artificial Intelligence faculty and the Director of PTIT.AI Research Lab., PTIT. Previously, I was a Research Scientist at VinAI Research (from November 2019 to March 2025); a Marie Curie Research Fellow at Philips Research, High-Tech campus Eindhoven, the Netherlands; a Research Associate at Open Lab, Newcastle University, UK; a Research Assistant at Jornada Experimental Range, the United State Department of Agriculture, USA; and a Teaching Assistant at PTIT. My research interests include Deep Generative models, Computer Vision, Human Activity Recognition, Deep Learning and Pervasive Healthcare.

Professor Dang The Ngoc
PTIT

Ngoc T. Dang received the B.E. degree in electronics and telecommunications from the Hanoi University of Technology, Hanoi, Vietnam in 1999, the M.E. degree in electronics and telecommunications from the Posts and Telecommunications Institute of Technology (PTIT), Hanoi, in 2005, and the Ph.D. degree in computer science and engineering from The University of Aizu, Aizuwakamatsu, Japan, in 2010. He was an Invited Researcher with FOTON ENSSAT Lab., Universite de Rennes 1, France, in 2011, and a Research Fellow with Computer Communications Lab., The University of Aizu, Japan, in 2012, 2013, 2015, and 2017. He is currently an Associate Professor/Head with the Department of Wireless Communications, PTIT. His current research interests include the area of communication theory with a particular emphasis on modeling, design, and performance evaluation of optical CDMA, RoF, and optical wireless communication systems.

Scientists

Professor Long Nghiem
University of Technology Sydney (UTS), Australia

I am the Director of the Centre for Technology in Water and Wastewater and a Professor in Environmental Engineering at the School of Civil and Environmental Engineering, UTS.

The overarching aim of my work is to discover, develop, and transfer new knowledge, skills, and technologies that improve the provision of clean water and purification of wastewater in service to society.

Prior to joining UTS, I have received research training and experience from the University of New South Wales, Yale University, University of Melbourne, and University of Wollongong. In 2009, I was a visiting professor at Colorado School of Mines. In May and June 2016, i was an August-Wilhelm Scheer Visiting Professor at the Technical University of Munich. To date, I have supervised to completion 20 PhD and 8 MPhil students, and have overseen the delivery of numerous research projects with over \$3 million in funding.

Professor Tran Xuan Tu
VNU and UTS

Xuan-Tu Tran received a B.Sc. degree in 1999 from Hanoi University of Science and a M.Sc. degree in 2003 from Vietnam National University, Hanoi, all in Electronics Engineering and Communications; and a Ph.D. degree in 2008 from Grenoble INP (at the CEA-LETI), France, in Micro Nano Electronics.

He is currently a full professor at Vietnam National University, Hanoi (VNU), and the Director of VNU Information Technology Institute. He was an invited professor at the University Paris-Sud 11, France (2009, 2010, and 2015), the University of Electro-Communication, Tokyo (2019), Grenoble INP (2011), and adjunct professor at the University of Technology Sydney (2017–2023). He was the Director of the VNU Key Laboratory for Smart Integrated Systems (SISLAB) from 2016 to 2021, Co-Director of the Joint Technology and Innovation, Research Centre (JTIRC), 2017-2020). His research interests include designing and testing systems-on-chips, networks-on-chips, design-for-testability, asynchronous/synchronous VLSI design, low-power techniques, and hardware architectures for multimedia applications. He is in charge of CoMoSy, VENGME, ReSoNoC, IOTA, ADEN4IOT, Secu-IoT, UBGIoT projects for designing HW architectures of embedded systems and multimedia applications. He has published 3 books, 7 patents and more than 120 peer-reviewed publications in these areas.

He is a Senior Member of the IEEE, IEEE Circuits and Systems (CAS), IEEE Solid-State Circuits and Systems (SSCS), member of IEICE, and the Executive Board of the Radio Electronics Association of Vietnam (REV). He serves as Chairman of IEICE Vienam Section, Chairman of IEEE SSCS Vietnam Chapter. He also served as general chair/co-chair and technical/organizing committee member for numerous international conferences (MCSoC, ICICDT, ATC, DAC, ICDV, DELTA, GIIS, ICCE, RIVF, APCCAS, ICCD, ICCAS, HP3C, NICS, APCC, ACOMP, CommandTel, ICGHIT...), Editor and reviewer for many pretigous scientific journals such as IEEE JSSC, IEEE TCAS-I/TCAS-II, IEEE TVLSI, JSA, Microprocessors and Microsystems, etc. He won the Second Prize (the 2nd best) of "Vietnamese Talents Award" in 2015 (Giải thưởng Nhân Tài Đất Việt) and the VNU Scientific Award for the period 2011-2016.

Scientists

Professor Hoang Dinh
University of Technology Sydney (uts), Australia

Hoang Dinh received his Ph.D. degree from the School of Computer Science and Engineering, Nanyang Technological University, Singapore, in 2016. He is currently an associate professor at the University of Technology Sydney (UTS), Australia. Over the last ten years, he has significantly contributed to advanced wireless communications and networking systems. His excellent record evidences this with one patent filed by Apple Inc., five books, eight book chapters, more than 90 IEEE Q1 journals and 60 flagship IEEE conference papers in communications and networking. Most of his journal papers have been published in top IEEE journals, including IEEE JSAC, IEEE TWC, IEEE COMST, and IEEE TMC. Furthermore, his research papers have had a high impact, evidenced by more than 15,000 citations (according to Google Scholar) over the last ten years.

Since joining UTS in 2018, he has received more than AUD 3 million in external funding and several precious awards, including the Australian Research Council Discovery Early Career Researcher Award for his project "Intelligent Backscatter Communications for Green and Secure IoT Networks," IEEE TCSC Award for Excellence in Scalable Computing for Contributions on "Intelligent Mobile Edge Computing Systems" (Early Career Researcher), and IEEE TCI Rising Star Award for "Technical Contributions on the Internet." Alternatively, he is the lead author of two authored books, "Ambient Backscatter Communication Networks," published by Cambridge Publisher in 2020 and "Deep Reinforcement Learning for Wireless Communications and Networking," published by IEEE-Wiley Publisher in 2022. He is currently an Editor of IEEE TMC, IEEE TWC, IEEE TCCN, IEEE TVT, and IEEE COMST.

Scientists

Professor Truyen Tran
Deakin university, Australia

Dr Truyen Tran is Professor at Deakin University where he is leading a world-class research team on competent and human-compatible AI through advanced machine learning. He and his team have made numerous contributions in deep learning, generative AI, machine reasoning, unifying language and vision, cognitive architectures and social AI. As Head of AI, Health and Science, he leads the effort to push the transformation of science, healthcare and engineering through AI. These include efficient exploration of molecular space, acceleration of drug discovery, materials characterisation, battery design and optimisation, and automation of software engineering.

Dr Tran has received multiple recognitions, awards and prizes for his research contributions at top AI conferences and journals. He holds a BSc. from the University of Melbourne (2001) and a PhD in Computer Science from Curtin University (2008).

Professor Nguyen Phi Le
Hanoi University of Science and Technology (HUST), Vietnam

Phi Le Nguyen is a lecturer at the School of Information and Communication Technology, Hanoi University of Science and Technology. She received her B.E. and M.S. degrees from the University of Tokyo in 2007 and 2010, respectively. She received her PhD degree in informatics from National institute of Informatics, Japan in 2019. Her major is networking which includes optimization of network protocols, optimization of network deployment, resource management and performance analysis of both wired and wireless networks. Currently, she is focusing on exploiting machine learning to enhance network performance.
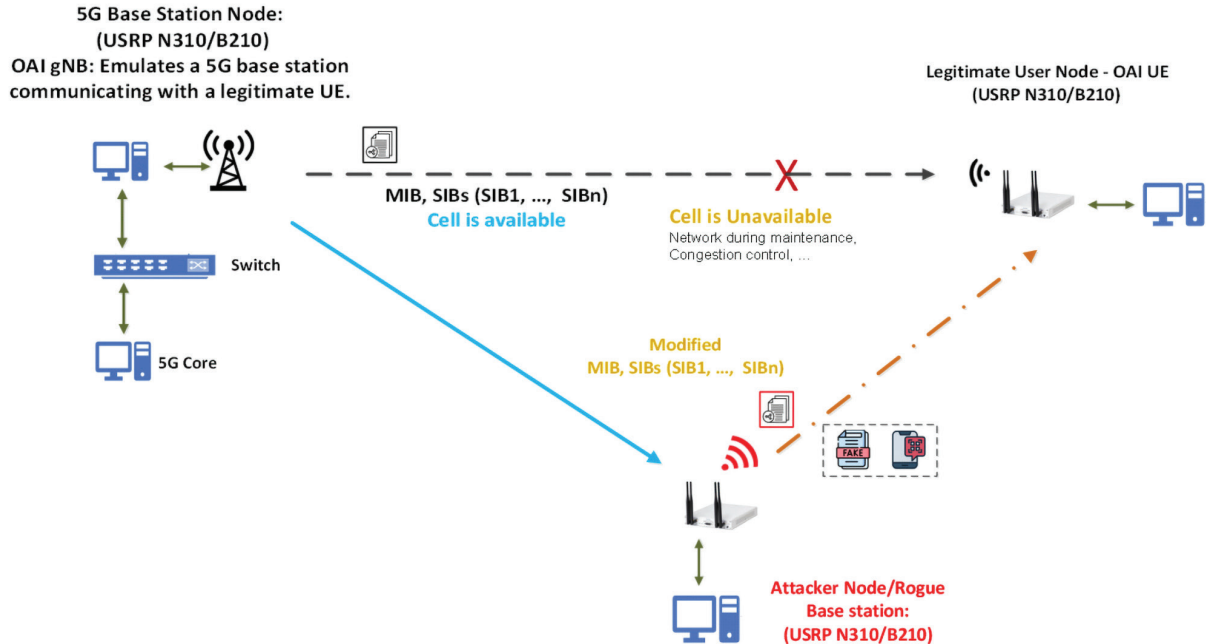
TECH DEMOS AND USE CASES

Demo 1

Toward Secure 5G. How Hackers Can Trick 5G & How We Can Stop Them?

This is to showcase how we can collaborate to investigate unknown vulnerabilities from the 5G systems and find potential solutions. This is of interest to not only Australia, Vietnam but also to the global 5G community.

- When our phone first connects to a 5G network, the handshaking process (between our phone and the 5G infrastructure) is vulnerable. This demo shows how attackers can take advantage of that process.

- We recreate a real-world attack where a fake 5G base station sends out signals to trick our phone into connecting to it instead of the real one. Once connected, the attacker can intercept or disrupt the connection or launch other attacks, e.g., phishing.

- Using special hardware (called USRP devices) and OpenAirInterface, we emulate both a legitimate 5G base station and a sneaky attacker. We then show how our system can detect and stop this fake signal using a lightweight security method.

Why it matters: This demo helps us understand how real-world 5G attacks work and how we can build smarter defenses to keep users and networks safe.

Demo 2

Towards Responsible and Privacy-preserving AI. Can AI Classify Your Photo Without Ever Seeing It?

This demo shows how we can protect data and users' privacy while still enjoying powerful AI tools with 5G Edge Computing capability!

- When we take a photo, e.g., using our iPhone and upload it for AI to analyze, like identifying famous landmarks, it might also reveal private details like people's faces, your location, or your surroundings? We can try it on your iPhone with the Photos app as well (by searching for Sydney for instance).

- In this scenario, a user takes a photo of one of five famous Australian landmarks. But instead of sending the raw image directly to the cloud (risk leaking privacy), the photo is first encrypted using Homomorphic Encryption (HE) with the help of a 5G mobile edge node. This edge device securely encrypts the photo before it's sent to the cloud server.

- The server then runs a machine learning model on the encrypted image, without ever seeing the actual content. The classification result (e.g., Sydney Opera House or Uluru) is also encrypted and sent back to the edge node, which decrypts the result and delivers it to the user.

Why it matters: This demo shows how 5G-enabled edge computing can enhance privacy in real-time AI services like ChatGPT, DeepSeek. Users get the benefits of fast, intelligent cloud-based classification, without exposing their personal data. It's a major leap for privacy-preserving AI in the 5G/6G era.

⚙️ Your data stays private. The AI still works. 5G makes it fast and secure.
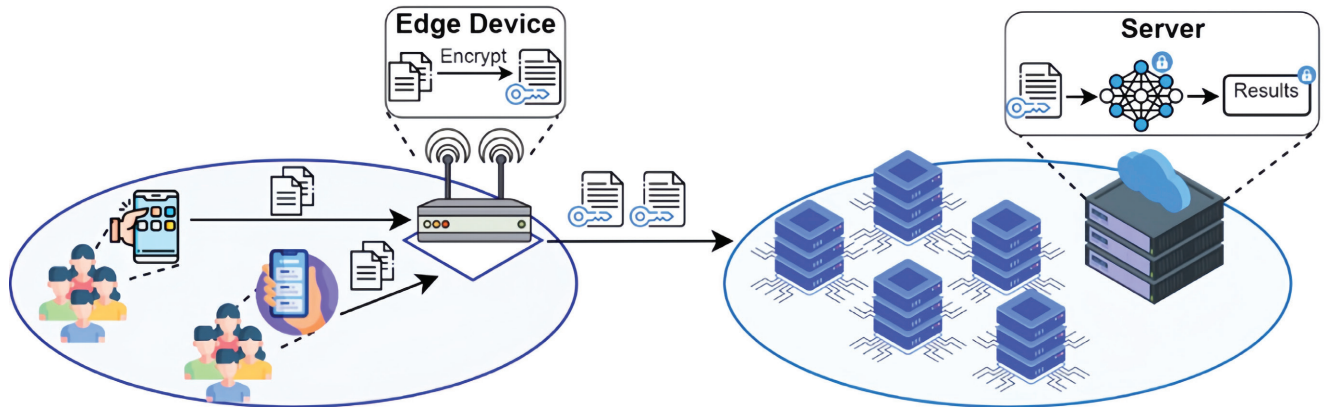
To link with the practical scenario, we design the demo serving for a landmark recognition application
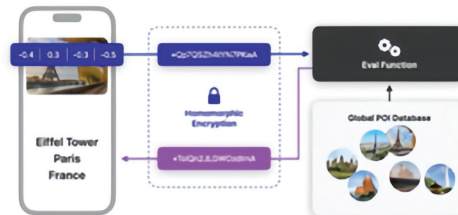
We create the laboratory dataset for the Australia Landmark Recognition (ALD) with 5 famous landmarks:

Sydney Opera House

Sydney Harbour Bridge

Great Ocean Road

Great Barrier Reef

Uluru

Demo 3

5G-empowered Vietnam-Australia Cultural Exchange Through Virtualized Landmarks

This demo showcases how enhanced broadband services in 5G (up to 10Gps) can facilitate emerging VR/XR applications and cultural exchange between Australia, Vietnam and the world through digital twins of landmarks.

- In this demo, in partnership with YooTek (a Vietnam company) and Ripper Corp (an Australia's partner), we develop and deploy virtualized/digital twins of Vietnam's and Australia's famous landmarks like Van Mieu/Literature Temple, Sydney Opera House and Sydney Harbor Bridge, Blue Mountain.

- Users from Australia, Vietnam, and anywhere in the world can then immersively explore these landmarks (with or without a VR gear) by selecting areas to visit and using mouse on PC or touchscreen on smart devices. Directional arrows guide users through the tour, making it feel like a real-life visit with audio narration in different languages (thanks to AI).

- We also share these virtual landmarks on YooLife, a pioneering VR social network platform developed by YooTek (a Vietnam company) so that users experience and interact with each other virtually.
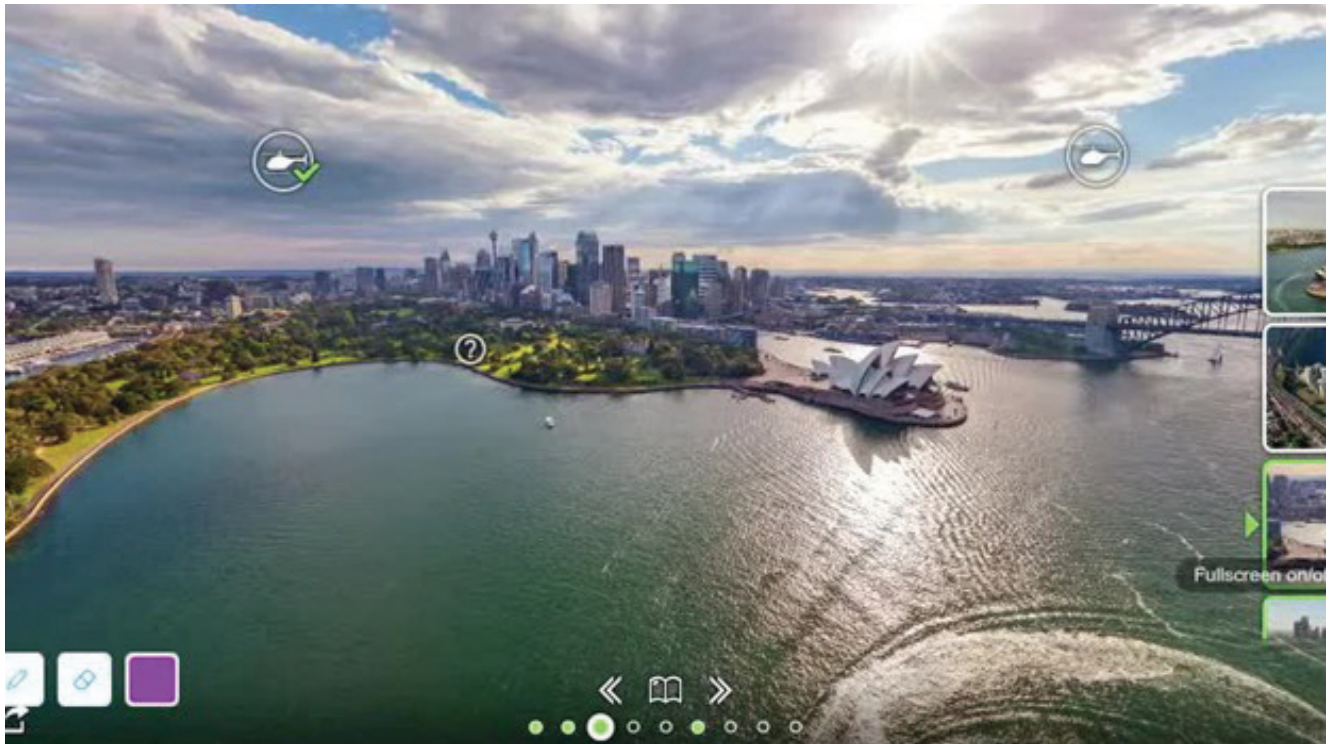
Demo 4

Toward 5G-empowered Advanced Manufacturing. Can You Control a Robot Without Crashing? It All Depends on the Network!

In advanced manufacturing, we may need to control a mobile robot remotely, steering it around obstacles by watching a live video from its onboard camera. Sounds simple, right? But what if the video feed is delayed? This demo shows how the type of cellular networks, 3G, 4G, or 5G, can make a huge difference.

We stream live video from a robot over different mobile networks:

ON 3G
the delay is so high that the robot crashes into obstacles before you can react.

ON 4G
the delay is better, but you still need quick reflexes to avoid collisions.

ON 5G
the video is nearly real-time, letting you control the robot smoothly and safely, with **no crashes.**

Why it matters: This demo highlights the power of low-latency 5G communication. In the future, technologies like remote robotics, drones, autonomous vehicles, and even remote surgery will rely on this ultra-fast connection to keep people and machines safe.

Faster networks = Safer, smarter, and more responsive robotics.
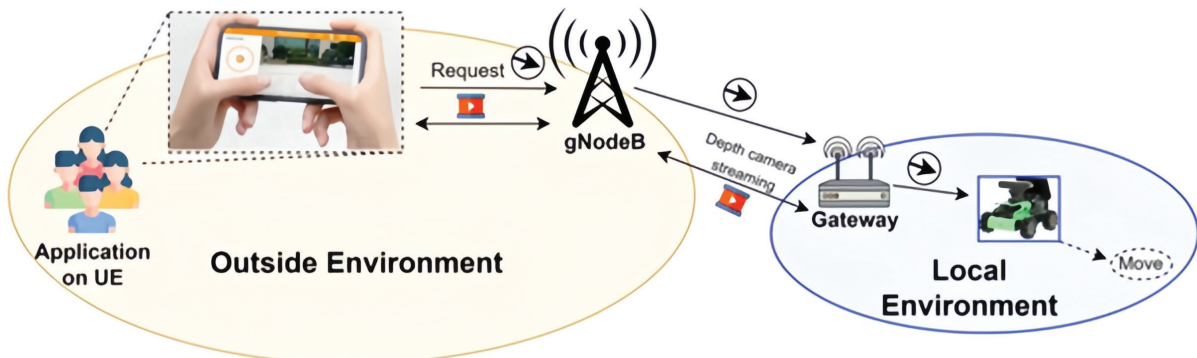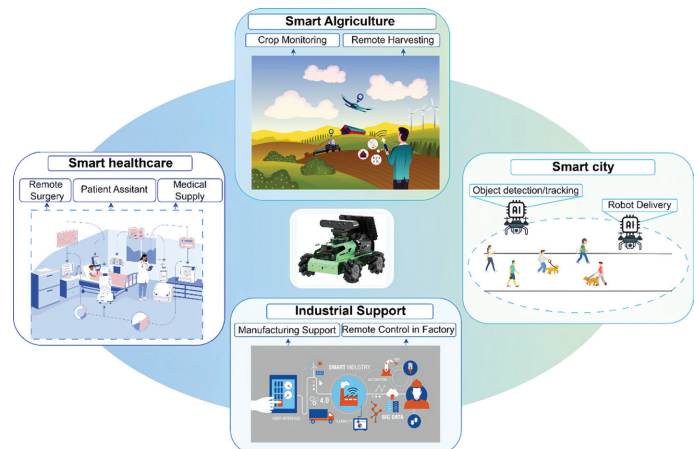
Demo 5

5G- and AI empowered Vietnamese Sign Language

Interpretation

This demo shows how 5G and AI's potential in offering a practical, inclusive, and user-friendly tool for Vietnamese sign language interpretation and learning.

Challenges:

- How can normal people communicate with the deaf if we do not know sign language?

- Sign language, unlike vocal communications, is video-based traffic that requires significantly more bandwidth, especially when many people are involved.

- Additionally, due to the lack of investment, the training data, especially for Vietnamese sign language (VSL), the AI model training for real-time/online VSL interpretation is still limited.

Challenges:

Through the collaboration between scientists from PTIT and UTS, we will showcase our online platform, CoSign, that aims to facilitate the interface between spoken users and deaf users. CoSign offers a practical, inclusive, and user-friendly tool for sign language learning and translation. Through this collaboration, a more advanced dataset of sign language was successfully collected with more than 10,000 videos from deaf users. This dataset will help to improve the tool's performance and robustness as well as be an invaluable asset to share with other research communities. We will publish it by the end of this year to contribute to the global AI-for-good movement.

We also set up a community of Deaf Connect for Digital Future. Our next steps include supporting initiatives that utilize this tool or other digital-transformation-based approaches to serve deaf communities. This effort reflects our team's dedication to technological equity, and long-term societal impact.

Demos:

- Real-time translate sign language to text
- Text to sign language
- Facilitate VSL learning/practicing

Guests/participants:

Users/teachers from 4 Schools for Deaf Children and People in Vietnam
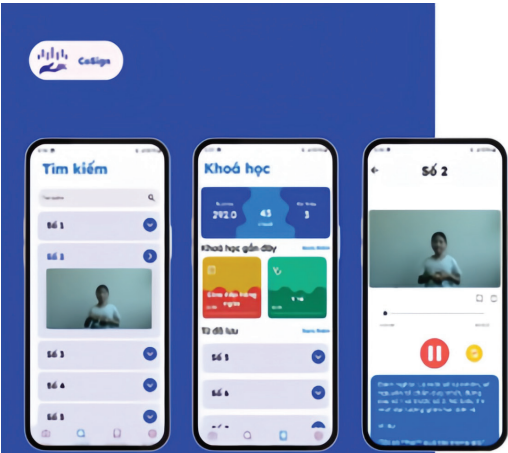
CoSign's Features

01 The application leverages a trained AI model to recognize sign language gestures within videos - allow user to translate from sign language to text.

02 Search for the corresponding text to sign language in our Vietnamese sign language dictionary.

03 Allow user to practice their own sign language gestures, enabling a highly interactive and personalized learning experience.

Demo 6

5G-empowered Entertainment/Gaming. Who "Shoots" Faster — The Player or the Network?

This demo shows how 5G can empower entertainment and the game industry that are significant part of the global economy.

Step into the Wild West for a thrilling VR showdown! In this demo, two players face off in a cowboy gunfight, but there's a twist. One player is connected over a 4G network, while the other uses 5G. The difference? Speed.

Both players wear VR headsets and prepare to draw their virtual guns in a one-on-one duel. As the countdown hits zero, they must shoot as fast as they can, but whoever's network responds quicker has the upper hand.

ON 4G
the high latency (200ms) causes a delay, making the player's reaction feel sluggish.

ON 5G
with ultra-low latency (just 3ms!), the gun fires almost instantly, giving that player a major edge.

A live TV screen displays the action in real-time, along with each player's network type, ping, and speed, making it clear how important fast connections are in competitive games.

Why it matters: This demo is a fun and interactive way to show how 5G's ultra-low latency transforms gaming and other real-time applications. Whether it's esports, remote control, or VR, milliseconds can be the difference between winning and losing.

The network you choose might decide your fate in the Wild West.

4G
Ping: 200ms
Down: 2Mbs
Up: 1.5Mbs

5G
Ping: 3ms
Down: 20Gbss
Up: 15Gbs
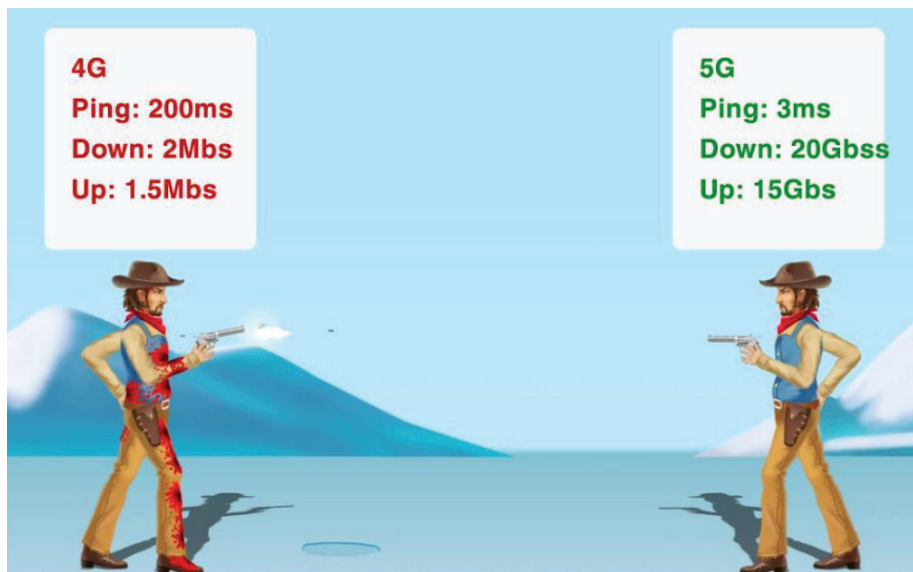
Demo 7

5G-empowerd Telemedicine. Can Fast Networks Help Save a Child's Life?

In this VR simulation demo, two users take on the roles of emergency doctors working together to save a pediatric patient in critical condition by practicing chest compressions and bag-valve-mask ventilations, in perfect sync. During the procedure, precise timing is everything.

- The players are connected over different networks, one using 4G, the other using 5G.

- In this demo, we will show that during the procedure, precise timing is everything. After every 15 compressions, the team must switch to 2 ventilations, just like in real emergency protocols. But when the connection is slow (like with 4G), delays cause desynchronization, leading to missed signals, timing errors, and poor outcomes.

- Then, the same simulation is repeated using 5G. With its ultra-low latency and reliable speed, the players are now fully synchronized, responding in real time, like a well-trained team.

Why it matters: This demo shows how next-gen networks like 5G can dramatically improve the accuracy, timing, and success of mission-critical teamwork, especially in healthcare training and remote response situations.

When every second counts, a faster network can make all the difference.
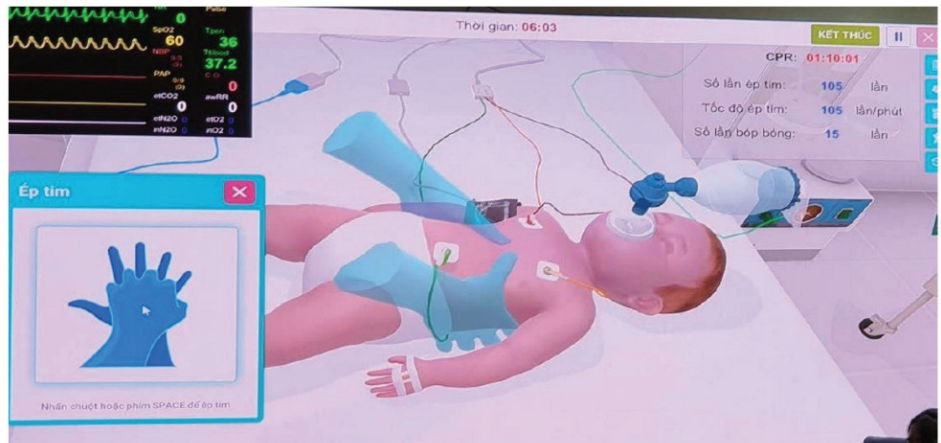
Demo/Use Case 8:

Nokia Network Digital Twin helps private network operators monitor network performance.

- ■ Use a virtual replica of your network to make your industrial site more efficient and productive

- ■ Nokia Network Digital Twin enables you to monitor your network operations in real time and predict maintenance needs and potential downtime in advance. It helps you increase efficiency and productivity by reducing disruptions in your production.

- ■ The solution provides a virtual representation of your communications network along with its operating environment. You can use the Network Digital Twin to:

| ● View the network from the vantage point of Nokia Industrial devices | ● Ensure that network service-level agreements (SLAs) are being met | ● Take recommended actions in case of sub-optimal network performance | ● Test new scenarios without impacting the current environment |

- ■ The Network Digital Twin helps you get the most out of your private wireless network in your Industry 4.0 journey. It is pre-tested with Nokia Digital Automation Cloud and Modular Private Wireless.

Demo/Use Case 9: Nokia Team Comms

- ■ Nokia Team Comms delivers business-critical push-to-talk voice, video and data communications allowing teams to collaborate on one-to-one and group calls, both indoors and outdoors, across any industrial campus — including mines, ports and factories, without needing access to the internet.

- ■ Push-to-x application for reliable and secure campus-wide communications with no internet connection required

- ■ Nokia Team Comms is a cost effective and easy-to-set-up 3GPP aligned solution that meets the need of one-to-one and one-to-many push-to-talk/video and messaging. It includes a web console for user management and deployment powered by a Nokia private wireless network.

| ● Easy set up: simply click- to-deploy from the Nokia Industrial Application Catalog | ● Works without internet connectivity | ● Includes the ability to record all voice, video and text conversations | ● All data remains on-premises at the enterprise edge (Nokia MX Industrial Edge) | ● Designed to work on any Android 11+ device, pre-tested on all Nokia-supplied devices |

**AUSTRALIA - VIETNAM
STRATEGIC TECHNOLOGIES CENTRE**

We proudly unveil the logo of the Australia–Vietnam Strategic Technologies Centre, a symbol of collaboration, innovation, and partnership.

At the heart of the design are two dynamic boomerang forms, artfully shaped to represent the initials "A" and "V" for Australia and Vietnam. The Southern Cross constellation proudly marks Australia's identity, while the radiant yellow star mirrors the flag of Vietnam—each element a tribute to our distinct yet harmonizing national narratives. These forms not only echo the cultural heritage of both countries but also symbolize the reciprocal flow of knowledge, ideas, and technology—hallmarks of our strategic partnership.

The color palette— deep blue, bright red, and radiant yellow —draws directly from our national flags, embodying pride, vitality, and a forward-looking spirit. Two stippled bands connecting the boomerangs represent the strength and resilience of our Comprehensive Strategic Partnership, reflecting a relationship grounded in trust and reinforced by shared goals.

Encircling these elements is an elegant orbital loop featuring a satellite, signifying the Centre's shared commitment to advancing cutting-edge technologies with a global vision.

This emblem powerfully encapsulates our joint pursuit of technological excellence—across fields such as 5G, artificial intelligence, cybersecurity, and next-generation communications. It stands as a bold declaration of our intent to build an innovative, resilient, and inclusive digital future.

Let us move forward together, united in purpose, inspired by innovation, and strengthened by partnership.