



MELBOURNE SCHOOL OF ENGINEERING

RESEARCH TEAMS LOCATED AT MELBOURNE CONNECT

Industry have the opportunity to co-locate with world-leading expertise in digital technology, with a focus on AI, data science and robotics.

The Melbourne School of Engineering will have a strong co-located presence at Melbourne Connect, alongside complementary and interdisciplinary groups from across the University working on solutions and new technologies.

By 2025, the Melbourne School of Engineering will have 18 research groups located at Melbourne Connect*, amounting to 282 academics and 557 research students.

COMPUTING AND INFORMATION SYSTEMS

Research Group	Research Focus	Academic Lead	In the Press
Artificial Intelligence Data Science	Use of Artificial Intelligence and data science to gather, analyse, and clean a large amount of data. Apply data mining, machine learning and deep learning techniques	<u>Associate Professor Tim Miller</u>	<u>Should we work with or turn off AI?</u> <u>Two data points enough to spot you in open transport records.</u> <u>Is it really a myth that our data isn't safe?</u> <u>What were you thinking?</u>
Artificial Intelligence Digital Health	Use of Artificial Intelligence in digital health, the analysis and usage of complex medical data and information.	<u>Associate Professor Tim Miller</u>	<u>Could your smartphone become your therapist?</u> <u>Crowd sourcing the problem of lower back pain.</u>
Artificial Intelligence Natural Language Processing	Using machine intelligence to leverage human language is a fundamental technique for utilising Artificial Intelligence, which can be used in medicine, government and to assist search engines. The natural language processing team work on a variety of methods to make computers better able to find and use textual documents and supplement human abilities.	<u>Associate Professor Tim Miller</u>	
Artificial Intelligence Simulation Optimisation	Artificial intelligence that integrates optimisation techniques into simulation analysis i.e. machine learning.	<u>Associate Professor Tim Miller</u>	<u>Will a computer take your job?</u>
Computer Science: Algorithm	Computer programming - a sequence of instructions, typically to solve a class of problems or perform a calculation. Effective data structures and algorithms optimise the performance of any computer program. Computer science has a number of continuing areas of interest including text information retrieval (search) technology, text indexation and compression, and the analysis of big data.	<u>Professor Egemen Tanin</u>	
Computer Science: Cyber	Understanding mindset of cyber, digital forensics, and privacy amongst others.	<u>Professor Egemen Tanin</u>	



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Computer Science: Distributed systems	Distributed computing is a field of computer science that studies distributed systems. A distributed system is a system whose components are located on different networked computers, which communicate and coordinate their actions by passing messages to one another. Distributed computing research group is pushing the boundaries of how we can extract more performance and computer-power from large-scale networks of computing devices.	<i>Professor Egemen Tanin</i>	
Melbourne eResearch Group (MEG)	The group provide research-oriented software engineering and design using a combination of the current bleeding edge technologies through to more tried and trusted software solutions. Learn more.	<i>Professor Richard Sinnott</i>	
Human Computer Interaction: Sociology	Human-computer interaction (HCI) serves as a powerful mechanism for both exploring the theoretical impacts of technology on human interactions as well as the application of technological systems to moderate interactions.	<i>Professor Vassilis Kostakos</i>	<i>Why that Instagram post may cost you more than you think.</i> <i>Using AI to make your smartphone smarter.</i> <i>Loving the bits and pieces.</i>
Information Systems: Engineering, Computing and Information Systems	Information Systems as an academic discipline studies how information technology can deliver value to individuals, organisations and societies at large, by enabling change and innovation. Key themes are business analytics and decision making, business process management, cybersecurity management, digital health, and innovations in the digital society.	<i>Professor Marcello La Rosa</i>	
Quantum Computing	The area of study focused on developing computer technology based on the principles of quantum theory, which explains the nature and behavior of energy and matter on the quantum (atomic and subatomic) level.	<i>Professor Udaya Paramalli</i>	



INTERDISCIPLINARY

Research Group	Research Focus	Academic Lead	In the Press
Centre for Artificial Intelligence and Digital Ethics	Collaboration between Melbourne Law School, Melbourne School of Engineering and Faculty of Arts. CAIDE will encourage and promote interdisciplinary research, teaching and leadership in the fields of AI and digital ethics.	<u>Professor Jeannie Paterson</u> <u>Associate Professor Tim Miller</u>	<u>What a second flaw in Switzerland's Svote means for NSW's Ivote</u>
Digital Ethics	An interdisciplinary research area concerned with all moral, political, social and ethical aspects of a technological society.	<u>Professor Reeva Lederman</u>	
ARC Training Centre in Computing for Medical Technologies	In partnership with IBM Research-Australia, the centre is aimed at creating a workforce that is expert in developing, applying and interrogating artificial intelligence ("AI") applications in data-intensive medical contexts, to facilitate the next generation of data-driven and machine learning-based medical technologies.	<u>Professor Tim Baldwin</u> <u>Professor Karin Verspoor</u>	

MECHANICAL ENGINEERING

Research Group	Research Focus	Academic Lead	In the Press
Computational Mechanics	Computational Mechanics is the discipline concerned with the use of computational methods to study phenomena governed by the principles of mechanics.	<u>Professor Richard Sandberg</u>	<u>Jetting into the future.</u>
Integrated Computational Materials Engineering (ICME)	Integrated Computational Materials Engineering is an approach to design products, the materials that comprise them, and their associated materials processing methods by linking materials models at multiple length scales.	<u>Professor Graham Schaffer</u>	<u>Engineering gender equality</u>



INFRASTRUCTURE ENGINEERING

Research Group	Research Focus	Academic Lead	In the Press
Geomatics	Geomatics-based spatial technology transforms the functionality of built environments and the administration of both public services and private enterprises - we develop and apply spatial sensing, mapping, analysis and communication technology.	Professor Stephan Winter	Ridesharing goes social.
Hydrology and Water Resources	Working in interdisciplinary teams to tackle use-inspired research questions to advance sustainable management of land, water and coastal resources. We work in urban, rural, subsurface, natural, freshwater and coastal environments, applying a broad range of research methods including flexible application of field observations, laboratory experimentation, simulation modelling and advanced statistical methods.	Professor Michael Stewardson	A drought of land and flooding rains. Preventing more fish deaths in the lower darling. Why we need to use water desalination plants early How did it come to this?
The Centre for Disaster Management and Public Safety (CDMPS)	CDMPS strives to promote disaster management research at the University of Melbourne. It fosters interdisciplinary research collaborations, provides training and skills development for our community of researchers, and promotes knowledge exchange and impact with regional, national and international stakeholders.	Professor Abbas Rajabifard	Preparing for our new extremes
The Centre for Spatial Data Infrastructures and Land Administration	The Centre undertakes research in a variety of areas relating to spatial data infrastructures, spatial enablement and land administration in order to support the sustainable development goals.	Professor Abbas Rajabifard	Fisherman's Bend gets Victoria's first digital twin
Transport Technologies	The Transport Engineering program is focused on contemporary topics in transportation engineering including connected vehicle and roadways, autonomous vehicles, connected public transport and city logistics, connected travelers and smart stations.	Professor Majid Sarvi	New fixes for old traffic problems Sounds like Science Fiction Stopping the stampede planning for urban emergencies

*Correct as May 2020.