RMIT Vice-Chancellor's Research Fellowships

2024 Strategic Research Priority Areas & High-Priority Topics

We live in a world that is undergoing great change and uncertainty. Over the next decade, we will live and work through complex challenges in climate, security, inequality, health and wellbeing, technological revolutions, and emerging social movements. RMIT University is committed to work with our partners and communities to find new solutions and apply transdisciplinary approaches to help society, the environment, and the economy, navigate these challenges.

The RMIT Vice-Chancellor's Research Fellowship program aims to provide researchers from all backgrounds an opportunity to flourish whilst making a positive real-world impact. If you value building connections between different people and skills, seek to make a genuine difference to Australia and the world through your research, and can demonstrate creativity and imagination in your approaches, we encourage you to apply for an RMIT Vice-Chancellor's Research Fellowship.

Applications are now open at academic levels A through to D, in three areas of research focus: Regenerative Futures, Digital Innovation, and MedTech Innovation. Under each of these overarching research areas, specific high-priority topics are provided to focus your application on for this recruitment round.

Appointment of Vice-Chancellor's Research Fellows will be on merit, taking into account strong alignment with the areas of research focus and high-priority topics, and capability for impact linked to one or more of RMIT's Enabling Impact Platforms.

1. Regenerative Futures

Regenerative Futures moves beyond 'sustainable' practices to restore, renew and revitalise social, economic and environmental systems. The RMIT approach to Regenerative Futures brings together disciplinary knowledge and expertise across a spectrum of disciplines. We define regenerative futures research as that which integrates the needs of nature and society whilst also creating technologies, processes and initiatives with a positive, regenerative impact on natural and social systems. We are seeking experts in the following high-priority topics:

(R1). **Regenerative finance:**

Based in the School of Economics, Finance and Marketing, this high-priority topic is focussed on ESG (Environmental, Social, and Governance) and the financial system's sustainability, equity, and long-term value creation through economic models that are not only sustainable but also restorative, ensuring economic activities contribute positively to the environment and society.

Artwork 'Sentient' by Hollie Johnson

(R2). **Regenerative fashion systems:**

Based in the School of Fashion and Textiles, this high-priority topic is focused on research in processes of governance and transformation to transform textile and fashion systems towards regenerative principles, working with textiles technologists, fashion and textile designers, fashion enterprise scholars, and material scientists. Applications for Senior Research Fellowships are strongly encouraged.

(R3). **Social epidemiology, innovation and public policy:**

Based in Social Work and Human Services and/or Criminology and Justice Studies, this high-priority topic is focused on regenerative social equity and community well-being in the context of climate and social inequities and policy making based on quantitative methods and analytical capability drawing on large data sets.

(R4). **Regenerative built environments:**

Based in the interdisciplinary Post-Carbon Research Centre this high-priority topic is focused on research on provisioning future built environments within planetary boundaries, working alongside building scientists, engineers and architects. Key expertise may include energy analysis and climate risk assessment of buildings, bio statistical tools for advance health modelling for buildings retrofit, and universal redesign. Skills in urban data science and analytics, and hands on experience with micro and mesoscale urban climate modelling and air pollution simulations would also be desirable. Fellows will focus on the development and application of advanced tools and methodologies for decarbonising the built environment and creating regenerative futures.

(R5). **Regenerative governance:**

This high-priority topic is focused on research excellence in design leadership and land and housing governance for climate justice. With a disciplinary base in either design or urban research, thematic areas of focus will be climate justice, public policy and governance, land use policy and planning and relationships to Indigenous sovereignties and Treaty-making.

(R6). **Environmental regeneration:**

This high-priority topic is focused on fostering regenerative futures through sustainable water management and innovative environmental, nature positive solutions. Fellows will have expertise in the development of cutting-edge technologies and strategies that address critical challenges in water scarcity, pollution, and ecosystem restoration. By integrating interdisciplinary approaches, Fellows will collaborate with global experts and industry leaders to create resilient and regenerative systems that ensure a sustainable future. This research provides a platform to drive impactful research that aligns with RMIT University's commitment to environmental stewardship and regenerative practices.

(R7). **Regenerative infrastructure:**

This high-priority topic is focused on at transforming the construction industry toward sustainability. Fellows will focus on advancing material sciences, structural optimisation, and whole-life prediction to develop novel, carbon-neutral construction techniques. Fellows will apply advanced numerical modelling and digital technologies to create high-performing, sustainable infrastructure solutions. By integrating cutting-edge research with practical applications, Fellows will contribute to the development of user-centric, reliable approaches that significantly reduce the carbon footprint of construction activities.

(R8). **Circular economy:**

This high-priority topic is focused on developing innovative technologies for effective minimisation of waste. Successful applicants will emphasise the use of advanced materials, numerical modelling, and digital technologies to enhance smart design to minimise waste and, upcycling & recycling to convert waste into valuable resources particularly for products such as batteries, solar panels and electronics. Fellows will focus on creating sustainable, user-centric solutions that address the challenges of waste conversion and support a circular economy. By leveraging cutting-edge research techniques and field trials, Fellows will drive impactful changes in waste management practices, contributing to a more sustainable and regenerative future.

(R9). **Regenerative futures for health conditions:**

This high-priority topic is focused on supporting individuals with lung, heart, brain, and/or metabolic conditions in environments increasingly affected by climate change, bushfires, or other sustainability challenges. Concentrating on areas such as environmental health, disease prevention, and adaptive healthcare strategies, Fellows will contribute to the development of innovative solutions that mitigate the impact of environmental contaminants on vulnerable populations. By integrating cutting-edge research with sustainable practices, Fellows will play a key role in creating resilient healthcare approaches that safeguard health in a changing world.

2. MedTech Innovation

Medical technologies are revolutionising health outcomes and health expectations. RMIT leads, and is investing in, areas including better disease diagnosis via advances in imaging, biosensors and biomarkers, as well as harnessing state-of-the-art smart materials such as optoelectronics, new bioinformatics and digital health AI-enabled tools. We are also engaging nanotechnology for health in areas ranging from agriculture to cancer, supporting community health across the lifespan. In all these areas, RMIT has a deep commitment to ensuring medical technologies are designed to make a practical contribution to clinical outcomes and health providers, supported by our range of partnerships and co-location initiatives with major hospitals, health providers, and community organisations. RMIT also has its own supporting infrastructure including the Micro Nano Research Facility (MNRF), Advanced Manufacturing Precinct (including digital manufacturing), and The Victorian Medical Device Prototyping and Scale-Up Facility – Discovery to Device.

Across these diverse areas we need committed and innovative researchers to drive forward our research strategy for impact, and that build on collaborative initiatives with strategic research partners such as the Aikenhead Centre for Medical Discovery (ACMD), and Northern Health.

RMIT is seeking to build and enhance our research and innovation capability in MedTech in the following areas:

(M1). **Soft matter MedTech:**

This high-priority topic is focused on advancing MedTech innovation by harnessing the unique properties of soft materials. Fellows will focus on the design, fabrication, and characterization of advanced materials for next-generation medical technologies and contribute to groundbreaking research in soft matter, colloid science, and cellular biophysics, driving the development of innovative solutions for therapeutic, theranostic, and preservation applications. This topic offers a unique opportunity to collaborate with multidisciplinary experts and propel RMIT to global leadership in soft matter science.

(M2). **MedTech sensing:**

This high-priority topic is focused on advancing MedTech innovation through breakthroughs in opto-electronics, photonics, and miniaturized electronics. Fellows will explore new materials and technologies that span areas such as electronic materials, semiconductors, information processing, precision sensing, diagnostics, and treatment technologies to create cutting-edge solutions for medical applications. This research is pivotal in addressing current bottlenecks in MedTech, enabling the development of next-generation devices and systems that enhance patient outcomes and healthcare delivery.

(M3). **AI for MedTech:**

This high-priority topic is focused on transformative research aimed at revolutionising healthcare through data-driven technologies. Focusing on areas such as biomarker discovery, medical image processing, bioinformatics and clinical natural language processing (NLP), Fellows will contribute to the advancement of healthcare by developing innovative AI-driven solutions that enhance diagnostic accuracy and patient outcomes. By harnessing cutting-edge algorithms and vast datasets, Fellows will play a key role in AI driven technologies for early disease detection and improving healthcare delivery. This high-priority topic offers a unique opportunity to drive transformative changes in healthcare, aligning with RMIT's vision for ethical, privacy-compliant, and impactful AI in the MedTech sector.

(M4). **MedTech in clinical practice:**

This high-priority topic is focused on exploring how Medical Technologies can improve outcomes and interventions in Musculoskeletal, Cardiorespiratory, Cancer and/or Neurological Conditions. Focusing on the development and application of cutting-edge medical technologies, Fellows will contribute to the enhancement of clinical practice by creating innovative solutions that improve diagnosis, treatment, and rehabilitation. By integrating advanced technologies into clinical settings, Fellows will play a key role in optimising patient care and driving innovation in healthcare delivery.

3. Digital Innovation

Digital innovation is pivotal to the future of our digital economy, for both organisations and individuals. Emerging digital technologies have created new businesses, pushed automation deep into economic administration and operations, and disrupted industries and ways of working. RMIT is deeply involved in shaping this digital future. We have national leadership in digital technologies for information retrieval, artificial intelligence, deep learning, quantum technologies, and cybersecurity, coupled with a focus on human behaviour, user interaction, design, critical technology studies, creative practices, and FATE (fairness, accountability, transparency, and ethics). In a future where businesses, governments, and citizens interact in previously unimagined ways, RMIT's commitment is to advance world-leading and multidisciplinary digital innovation research for a prosperous and secure digital future.

As part of our research strategy for impact, RMIT is building on our existing world class research capability in digital innovation by identifying established and emerging research leaders with the capability to enhance Digital Innovation in the following high-priority topics:

(D1). **Law and technology:**

Based in the Law discipline and across the Business and Human Rights Centre and the Centre for Innovative Justice, Fellows will lead research on fintech and labour transformation, labour law, dispute resolution, mental health, energy efficiency, supply chain/modern slavery, organisational responsibility in conflict zones, edtech, and innovative justice.

(D2). **Digital innovation in business:**

This high-priority topic is focused on the business and law aspects of the complex interplay between AI-driven cybersecurity strategies, the development of frameworks for AI-based security tools, and challenges inherent in AI models and algorithms, and the implications for sustainability.

(D3). **EdTech:**

This high-priority topic is focused on digital applications, distributed learning platforms, AI, gamification, interactive learning, virtual classrooms, learning analytics, virtual and augmented reality, and digital resources. Fellows will lead research that intersects EdTech and best practices in learning and teaching, and on digital literacy in early childhood and/or school-based settings, including cybersecurity awareness and digital empowerment.

(D4). **Digital harms reduction:**

This high-priority topic is focused on digital ethnography, platform governance/policy, user wellbeing, digital literacy education and digital cultures. Fellows will have strong track records in this topic and will be working with experts on technology-facilitated abuse, online harassment, disinformation and other problematic communication based in the Digital Ethnography Research Centre. Also relevant is social science-based approaches to how information and communication technologies shape public perception.

(D5). **Regenerative digital design:**

This high-priority topic is focused on research that advances regenerative topics with simulation, virtual environments and digital design, aligned with the Centre of Digital Ecosystems CODE, a cross-disciplinary initiative.

(D6). **Quantum digital innovation:**

This high-priority topic is focused on research at the intersection of quantum computing and digital technologies. Fellows will lead projects in areas such as quantum sensing for sectors like health, mining, and telecommunications, or advancing methods to process and transmit quantum information. This high-priority topic also includes precision manufacturing of high-performance quantum devices using cutting-edge materials and simulations. Collaborating with leading researchers and industry partners, fellows will be aligned to RMIT capability in areas such as AI, and next-generation digital infrastructure, aligning with RMIT's strategic priorities.

(D7). **Intelligent control and power systems:**

This high-priority topic is focused on driving cutting-edge advancements in digital technologies to support sustainable energy systems that drive a net-zero future advancing through digital technologies that support control systems, power systems, and/or microgrid technologies. The focus is on developing innovative digital solutions for optimising energy distribution, enhancing grid stability, integrating renewable energy sources and potential technologies for transition to electric vehicles. Key research areas include the application of AI for energy management, advanced control techniques for smart grids, and strategies for efficient power systems operation.

(D8). **Digital manufacturing:**

This high-priority topic is focused on transformative research driving digital innovation in manufacturing. Concentrating on digital technologies to drive automation in areas such as process development, additive manufacturing, surface technologies, and post-processing, Fellows will contribute to the transformation of the manufacturing industry. Through the integration of digital ecosystems, Fellows will play a crucial role in creating scalable, efficient, and sustainable manufacturing processes. This high-priority topic offers a unique opportunity to influence industry transformation, aligning with RMIT's vision for a digitally advanced, sustainable, and resilient manufacturing sector.

(D9). **Innovation in AI-Human interaction:**

This high-priority topic is focused on areas such as information retrieval, artificial intelligence, interaction design, evaluation methods, and human behaviour. Fellows will contribute to the development of innovative AI systems that improve how users interact with technology. By harnessing cutting-edge research and advanced techniques, Fellows will play a key role in creating intuitive, efficient, and effective AI solutions that align with human needs and behaviours. This topic offers a unique opportunity to drive significant advancements in AI-human interaction, aligning with RMIT's vision for a future where technology seamlessly integrates with human experience.