

Foreword

We are delighted to welcome you to the Proceedings of the Cardiff University School of Engineering Research Conference 2024. Launched in 2023, this conference is part of our initiative to foster a vibrant research culture and promote dissemination activities at the School of Engineering, Cardiff University, in Cardiff, United Kingdom. The conference provides a platform to celebrate achievements in various engineering disciplines, and to explore and discuss further advancements in the diverse fields that shape contemporary engineering. In this edition, the structure of the conference programme reflected the crosscutting themes and collaborative nature of our research and was built around current and emerging research areas in the School:

Bio-based engineering brings together all of the engineering topics that interface with medicine or biology. This theme recognises both the pivotal role technology plays in revolutionizing healthcare and the implementation of biological processes in providing novel solutions to engineering problems.

Computational modelling and digital twins represents cutting-edge research into virtual representations of objects or systems that are updated with real time information and used to guide decision making. Our research in this area focuses on developing smart materials and structures, and sustainable processes that help create a sustainable and greener economy.

AI and deep learning focuses on the application of artificial intelligence and machine learning techniques in engineering. Our research in this field harnesses the power of AI in medical applications and in agriculture, improving the health and wellbeing of society.

Net Zero is a testament to our commitment to a greener, more efficient future. We aim to advance energy technology and play a key role in addressing the increasing demand for sustainable and low carbon technologies while reducing environmental impact and ensuring a sustainable environment. Our work helps to drive forward net-zero solutions for achieving the government carbon targets.

Future engineering represents state of the art technologies for the next generation such as wireless communication systems and future power systems engineering. This theme showcases the exciting and emerging interdisciplinary work being done in the School of Engineering.

These proceedings embody the shared vision of engineers and researchers from our School as they work to tackle today's challenges and pave the way for a brighter future. We extend our heartfelt gratitude to all participants, presenters, and sponsors for their invaluable contributions to this effort, and we eagerly anticipate hosting this event again soon.

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