

Keynote Speech

Research in the Era of AI and Advanced Technologies: Bridging Disciplines and Putting Human at the Centre



The rapid advancement of Artificial Intelligence (AI) and other Advanced Technologies (AT) has significantly transformed the way research is conceived, conducted, and translated into impacts in the real world. However, this transformation is not only technological but also it is structural. Research today is increasingly considered by the convergence of disciplines, the integration of knowledge systems, and a growing emphasis on societal relevance. Across disciplines, emerging AI-driven tools have enhanced data analysis and enabled solutions to complex problems that were previously unattainable. However, this technological change has also redefined the nature of research collaboration, increasingly moving it beyond traditional disciplinary boundaries towards multidisciplinary, interdisciplinary and transdisciplinary research. Furthermore, it calls for partnerships that extend beyond academia, involving users, communities, and stakeholders as active contributors to knowledge creation.

This keynote presents how research in the era of AI and AT evolved, with particular emphasis on the growing importance of interdisciplinary and transdisciplinary research. The challenges associated with bridging disciplinary gaps, including differences in methodologies, terminologies, and research cultures, will be highlighted. Central to this discussion is the argument that, despite rapid technological progress, humans must remain at the centre of the research process. Advanced technologies should support the research but not replace human thinking, decision-making, and ethical judgment.

Through the experiences of research in bionics and assistive robotic technology, how AI and AT can be used to carry out research by empowering and keeping humans in the loop will be explained. These bionic-related research brings together expertise from engineering, biomedical sciences, rehabilitation, and computing, including AI, demonstrating how collaborative research can restore mobility, independence, and dignity to individuals. Furthermore, the keynote will present selected examples from research in bionics and assistive robotic technologies, to show that humans must remain at the centre of the research process. In these projects, AI are employed while following interdisciplinary approaches. These examples show how advanced technologies can augment human capability while preserving autonomy and dignity.



At the last phase, this keynote encourages a research culture that balances technological intelligence with human values. Such an approach is essential for ensuring that modern research not only advances scientific knowledge but also contributes meaningfully to human well-being and societal progress.

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About the Keynote Speaker

Ruwan Gopura earned his B.Sc. Eng. degree with honors in Mechanical Engineering in 2004, followed by an M.Eng. degree in Manufacturing Systems Engineering, both from the University of Moratuwa, Sri Lanka. He later pursued a Ph.D. in Robotics and Intelligent Systems at Saga University, Japan, in 2009. Subsequently, he engaged in postdoctoral research in bio-robotics at the same institution. Currently, he is a Senior Professor in the Department of Mechanical Engineering at the University of Moratuwa and serves as the Dean of the Faculty of Graduate Studies in the same University.

Prof. Gopura played a pivotal role as the founding Head of the Department of Medical Technology in the Faculty of Medicine at the University of Moratuwa. He also held the position of Director/Research at the university from February 2021 to January 2024. His past leadership roles include serving as the Head of the Department of Mechanical Engineering. Prof. Gopura is recognised for his expertise in developing bionic devices, such as robotic prostheses, orthoses, and exoskeletons. He has authored over 180 research articles, including publications in peer-reviewed journals and conferences, and holds multiple patents.

In addition to his academic contributions, Prof. Gopura serves as an academic editor for several journals. He was the chairperson of the IEEE Sri Lanka Section in 2020 and the IEEE Robotics and Automation Society Sri Lanka Section from 2017 to 2020. He was also the secretary of the IEEE Sri Lanka Section in 2015 and the IEEE Robotics and Automation Society Sri Lanka Section from 2012 to 2017. He is one of the distinguished lecturers in IEEE EMBS for 2025–2026. His work has been acknowledged with numerous research awards and grants.