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MANCHESTER 1824
The University of Manchester

The 2nd Rosenbrock Lecture Series

The Control Systems and Robotics group at the University of Manchester is organising the 2nd Rosenbrock Lecture Series to celebrate ground-breaking research accomplishments in the fields of Control Engineering and Robotics. Four distinguished world-leading experts in Control Engineering and Robotics will deliver the Keynote Lectures.

THURSDAY 11TH JUNE 2026

VENUE: Foyer, Nancy Rothwell Building, University of Manchester

AGENDA

Time	Event
08:30-09:00	Registration + Coffee
09:00-09:30	Welcome University of Manchester
09:30-10:30	**Keynote Lecture 1:** Reflections on vehicle dynamics and control: algorithms, mechanisms and estimation Prof. Malcolm Smith, University of Cambridge
10:30-11:00	Coffee + Networking
11:00-12:00	**Keynote Lecture 2:** Articulated AUVs: Toward All-Terrain Marine Robots Prof. Kristin Y. Pettersen, Norwegian University of Science and Technology
12:00-13:00	Industrial Lecture, Quanser
13:00-14:00	Catered Lunch + Networking
14:00-15:00	**Keynote Lecture 3:** Optimal and Dual Control for Large-Scale Systems Prof. Anders Rantzer, Lund University
15:00-15:30	Coffee + Networking
15:30-16:30	**Keynote Lecture 4:** AI-Powered Feedback Control Systems Prof. Robert Bishop, Texas A&M University
16:30-16:45	University of Manchester Closing Remarks

Registration is open until 5pm on 8th May 2026.

Please contact Prof. Alexander Lanzon (**Alexander.Lanzon@manchester.ac.uk**) or
Dr. Joaquin Carrasco (**joaquin.carrasco@manchester.ac.uk**) in case of enquiries.

Free registration via **www.quanser.com/rosenbrock-lecture-series-2026**

KEYNOTE PRESENTERS

Keynote Lecture 1
Reflections on vehicle dynamics and control: algorithms, mechanisms and estimation

Prof. Malcolm Smith
University of Cambridge

The talk discusses the rich boundary between vehicle dynamics, mechanical networks and control systems, highlighting the role that control can play in engineering design. The talk begins with a discussion of the approach, theory and stochastic optimal control algorithm that was developed for the McLaren 720S semi-active suspension control system together with Panos Brezas and Will Hoult. The second part of the talk develops further the ideas of adjustable mechanical devices including the principles and realisability of losslessly adjustable one-ports with reference to recent work with Tryphon Georgiou and Faryar Jabbari. The final part of the talk connects with the first theme and describes recent work together with Greg Gakis on simultaneous input and state estimation.

Malcolm Smith received degrees in mathematics and control engineering from Cambridge University, England. He was subsequently a Research Fellow at the German Aerospace Centre, Oberpfaffenhofen, Germany, a Visiting Assistant Professor and Research Fellow with the Department of Electrical Engineering at McGill University, Montreal, Canada, and an Assistant Professor with the Department of Electrical Engineering, Ohio State University, Columbus. In 1990, he joined the Engineering Department, University of Cambridge, where he is currently a Professor and Head of the Control Group. He is a Fellow of Gonville and Caius College. His research interests are in the areas of robust control, nonlinear systems, electrical and mechanical networks, and automotive applications. Dr. Smith received the 1992 and 1999 George Axelby Best Paper Awards, in the IEEE Transactions on Automatic Control, both times for joint work with T.T. Georgiou. He is a winner of the 2020 IEEE Control Systems Technology Award (with W. Hoult and P. Brezas) and the 2025 IEEE Control Systems Award. He is a Fellow of the Royal Academy of Engineering.

Keynote Lecture 2
Articulated AUVs: Toward All-Terrain Marine Robots

Prof. Kristin Y. Pettersen
Norwegian University of Science and Technology

In this talk, I will present the development of a new class of marine robots: All-Terrain AUVs. These Autonomous Underwater Vehicles (AUVs) are poised to transform underwater data collection, pushing the boundaries of what is possible. Engineered for ultra-high-quality data collection, hydrodynamic efficiency, and unparalleled maneuverability, they represent a game-changer in underwater robotics. I will trace their evolution, which began with the pivotal research question of "How can we learn from nature to enhance robot mobility?" and progressed through fundamental research towards innovation and development.

Kristin Y. Pettersen is a Professor in the Department of Engineering Cybernetics at the Norwegian University of Science and Technology (NTNU), where she has been a faculty member since 1996. She is also an Adjunct Professor at the Norwegian Defence Research Establishment. She co-founded the subsea robotics company Eelume AS, where she served as CEO from 2015 to 2016 and currently serves as a board member. She received the IEEE CSS Hendrik W. Bode Lecture Prize in 2020 and was awarded an ERC Advanced Grant in 2021. She is a Fellow of the IEEE and IFAC, and a member of the Norwegian Academy of Technological Sciences, the Norwegian Academy of Science and Letters, and the Academy of the Royal Norwegian Society of Sciences and Letters.

Her main research interests are in the development of methodologies for the analysis and control of autonomous robots, with an emphasis on marine robotics and snake robotics.

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Optimal and Dual Control for Large-Scale Systems

Prof. Anders Rantzer
Lund University

The interplay between learning and control has a history dating back at least half a century, but a surge of new activities has recently been stimulated by progress in data-driven learning algorithms with strong ties to optimal control. This presentation will focus on concepts and ideas in the intersection between control and computer science. Special attention will be given to recent progress in the theory of dynamic programming, where new ideas enable computations with improved scalability and a deeper understanding of the classical exploration-exploitation tradeoff.

Anders Rantzer was appointed professor of Automatic Control at Lund University, Sweden, after a PhD at KTH Stockholm in 1991 and a postdoc 1992/93 at IMA, University of Minnesota. The academic year of 2004/05 he was visiting associate faculty member at Caltech and 2015/16 he was Taylor Family Distinguished Visiting Professor at University of Minnesota. Rantzer is a member of the Royal Swedish Academy of Engineering Sciences and a Fellow of IEEE and IFAC. He has been chairman of the Swedish Scientific Council for Natural and Engineering Sciences as well as the Royal Physiographic Society in Lund. His research interests are in modeling, analysis and synthesis of control systems, with particular attention to scalability and adaptation.

AI-Powered Feedback Control Systems

Prof. Robert Bishop
Texas A&M University

This presentation will illuminate how cutting-edge control systems and the transformative force of artificial intelligence (AI) are coming together to revolutionize tomorrow's technology landscape. At their core, feedback control systems act as the "nervous system" for machines—using sensors to gather information and actuators to respond—allowing robots, drones, and industrial devices to adjust themselves automatically and operate with remarkable smoothness. Traditionally, these systems have depended on strict mathematical models to steer their decisions. With the surge of AI, however, machines now have the remarkable ability to learn from real-world experience, adapt instinctively to new challenges, and make more insightful choices on the fly. This evolution means technology can become more dependable, require far less hands-on tweaking, and boldly tackle complex or unpredictable scenarios with greater finesse. Of course, this newfound autonomy can sometimes spark unexpected or even problematic behaviors. Some of the most fascinating ways AI and control systems unite include: self-optimizing machines that get smarter without any human intervention; AI-powered systems that detect issues before they surface; advanced modeling when mathematical equations fall short; and seamless collaborations that blend human intuition with machine intelligence. In essence, fusing AI with control systems empowers machines to learn, adapt, and make ever wiser decisions. This powerful partnership paves the way for safer, more efficient, and far more capable technology suites across countless industries and everyday life.
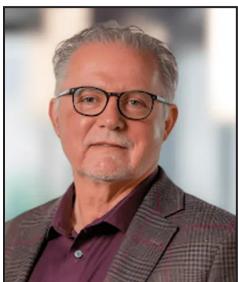
Robert Bishop is the Vice Chancellor for Engineering at the Texas A&M System, Dean of Engineering at Texas A&M University, Director of the Texas A&M Engineering Experiment Station and holds the Harold J. Haynes Dean's Chair in Engineering. He is a full professor position in the Department of Aerospace Engineering. Prior to academia, he was a member of the technical staff at the Charles Stark Draper Laboratory. As an active researcher and scholar, Dr. Bishop is a specialist in systems theory, guidance and control of spacecraft, and navigation and estimation with a special interest in small satellites and planetary precision landing. He co-authors one of the world's leading textbooks in control theory adopted in hundreds of universities worldwide having been translated into eleven foreign languages. Dr. Bishop received his PhD from Rice University in Electrical & Computer Engineering and his MS and BS from Texas A&M University in Aerospace Engineering. He is a Fellow of the American Institute of Aeronautics and Astronautics, Fellow of the American Astronautical Association, Fellow of the Institute of Electrical and Electronic Engineers, Fellow of the American Association for the Advancement of Science, and a member of the Pan American Academy of Engineering.

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