

Matemática Industrial

ADÉRITO ARAÚJO, ANA JACINTA SOARES, CLÁUDIA NUNES, MARGARIDA PINA,
VOLKER MEHRMANN

Resumo

Nas últimas décadas, tornou-se evidente que a Modelação, a Simulação e a Otimização desempenham um papel fundamental nos processos de inovação das empresas. A investigação matemática contribui também para avanços em áreas como a medicina, a cibersegurança, a previsão meteorológica, a compressão e extração de dados digitais, a aeronáutica e a computação, só para citar algumas. Esta sessão, que reúne especialistas que têm desempenhado um papel preponderante em empresas e instituições nacionais e europeias promotoras da Matemática Industrial, pretende discutir os complexos desafios que se colocam atualmente ao desenvolvimento de novos produtos/processos e como as parcerias entre o mundo académico e as empresas podem ajudar a resolvê-los.

Abstract

Over the last few decades, it has become clear that Modelling, Simulation and Optimization play a fundamental role in innovation processes in companies. Mathematical research also contributes to advances in areas such as medicine, cybersecurity, weather forecasting, digital data compression and extraction, aeronautics and computing, just to name a few. This session, which brings together experts who have played a leading role in national and European companies and institutions promoting Industrial Mathematics, aims to discuss the complex challenges currently facing the development of new products/processes and how partnerships between the academic world and companies can help solve them.

Sobre os participantes:

Adérito Araújo (moderator) is an associate professor in the Department of Mathematics at the University of Coimbra and a member of the Numerical Analysis and Optimisation group at the Centre for Mathematics of the University of Coimbra. Throughout his career, he has held executive positions in various national and international scientific associations, including the presidency of the European Consortium for Mathematics in Industry (ECMI) from 2018 to 2020. His scientific interests include

the development of mathematical and numerical models in biomedical applications, actively collaborating with engineers, doctors, physicists and chemists in multiple interdisciplinary projects. He is currently the secretary of EU-MATHS-IN (European Service Network of Mathematics for Industry and Innovation) and a member of the executive boards of the Portuguese Network of Mathematics for Industry and Innovation (PT-MATHS-IN) and of ECMI. He is currently editor-in-chief of the Journal of Mathematics in Industry (Springer), secretary of EU-MATHS-IN (European Service Network of Mathematics for Industry and Innovation) and a member of the executive board of the Portuguese Mathematics Network for Industry and Innovation (PT-MATHS-IN) and ECMI.

Ana Jacinta Soares is an Integrated Member at the Centre of Mathematics, University of Minho, and an Associate Professor at the Department of Mathematics, University of Minho. She received her Ph.D. in Mathematics from the University of Coimbra in 1997. Her research interests cover various topics in Mathematical Physics, Modeling of Biological, Physical, and Ecological Systems.

She has a particular interest in Industrial Mathematics and knowledge transfer to Industry, which is reflected in her strong involvement in this field. Actually, she is the President of the Portuguese Network of Mathematics for Industry and Innovation (PT-MATHS-IN). She has been involved in the organization of several industrial meetings and has participated in some industrial projects.

Cláudia Nunes is Professor at the Mathematics of Instituto Superior Técnico (<https://math.tecnico.ulisboa.pt/>), where she is Vice President for International Relations, and member of CEMAT (Center for Computational and Stochastic Mathematics, <https://cemat.tecnico.ulisboa.pt/main.php>), where she coordinates the research line of Statistics and Stochastic Processes. She has been collaborating with ECMI, as Chair of the Educational Committee (2016-2020), representative of Portugal in the Council (2020-2023), and Executive Director (Jan 2024-). She has taken part in several research projects involving industry, as supervisor of PhD students, as local-project leader and as project leader. She is Co-Editor of REVSTAT-Statistical Journal (2024-..), member of the board of the Mathematical Portuguese Society (SPM, 2016-2018), and member of the board of the Statistical Portuguese Society (SPE, 2015-2020).

Margarida Pina is a Business Development manager based in Porto, Portugal, with a big experience and background in consulting, project management and strategic innovation. She has been at the forefront of leading strategic projects since 2007, overseeing purchase and product management, operations management, and industrial mathematics laboratory management. Margarida excels in optimizing process, mobilizing teams and driving organizations towards future market trends, leveraging her extensive experience to prepare companies for upcoming challenges. Before her current role as Non Food Product Development Manager in Modelo Continente, Margarida was an Innovation and Development Manager, where she focused on business strategy, innovation management and organizational optimization. Her career began as a Senior Management Consultant, contributing to high-profile projects such as the

organizational architecture of international trade departments and efficiency programs for entities like Sonae, the Portuguese Criminal Investigation Police, and Coimbra University Hospitals. She holds a degree in Economics, supplemented by certifications in Project Management. Margarida is a dedicated professional with a passion for pioneering new frontiers in business development.

Volker Mehrmann received his Diploma in mathematics in 1979, his Ph.D. in 1982, and his habilitation in 1987 from the University of Bielefeld, Germany. He spent research years at Kent State University in 1979-1980, at the University of Wisconsin in 1984-1985, and at IBM Research Center in Heidelberg in 1988-1989. After spending the years 1990-1992 as a visiting full professor at the RWTH Aachen, he was a full professor at TU Chemnitz from 1993 to 2000. He was full professor for Mathematics at TU Berlin until his retirement in October 2023. He is a member of acatech (the German academy of engineering), academia europaea and the European Academy of Sciences, he was president of GAMM (the International association of Applied Mathematics and Mechanics), and until the end of 2022 president of the European Mathematical Society (EMS). He was chair of MATHEON, the Research Center ‘Mathematics for key technologies’ and the Einstein Center ECMath in Berlin. Volker Mehrmann is SIAM and AMS Fellow, has held an ERC Advanced Grant and also was member of the ERC Mathematics Panel. He is editor of several journals in numerical analysis and editor-in-chief of Linear Algebra and its Applications. His research interests are in the areas of numerical mathematics/scientific computing, applied and numerical linear algebra, control theory, the theory and numerical solution of differential-algebraic equations, and in energy based mathematical modeling.