Lecture Notes in Mechanical Engineering

Francisco J. G. Silva
António B. Pereira
Raul D. S. G. Campilho *Editors*

Flexible Automation and Intelligent Manufacturing: Establishing Bridges for More Sustainable Manufacturing Systems

Proceedings of FAIM 2023, June 18–22, 2023, Porto, Portugal, Volume 1: Modern Manufacturing

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Lecture Notes in Mechanical Engineering

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Preface

This volume of Lecture Notes in Mechanical Engineering (LNME) is one of two volumes including papers selected from the 32nd International Conference on Flexible Automation and Intelligent Manufacturing (FAIM 2023), held in Porto, Portugal, from June 18 to 22, 2023. The FAIM 2023 conference was organized by the School of Engineering, Polytechnic of Porto, located in Porto, Portugal.

Flexible Automation and Intelligent Manufacturing (FAIM) is a renowned international forum for academia and industry to disseminate novel research, theories, and practices relevant to automation and manufacturing. For over 30 years, the FAIM conference has provided a strong and continuous presence in the international manufacturing scene, addressing both technology and management aspects via scientific conference sessions, workshops, tutorials, and industry tours. Since 1991, FAIM has been hosted in prestigious universities on both sides of the Atlantic and, in recent years, in Asia. The conference attracts hundreds of global leaders in automation and manufacturing research who attend program sessions where rigorously peer-reviewed papers are presented during the multiple-day conference. The conference links researchers and industry practitioners in a continuous effort to bridge the gap between research and implementation.

FAIM 2023 received more than 400 contributions from over 40 countries and over 220 institutions around the world. After a two-stage double-blind review, the technical program committee accepted 263 papers. From these, 242 papers have been included in two LNME volumes, and 21 extended papers are published as fast-track articles in *Robotics and Computer-Integrated Manufacturing* and *The International Journal of Advanced Manufacturing Technology*. A selection of these LNME articles will be invited to submit substantially extended versions to special issues in ten international indexed journals, such as the *International Journal of Computer Integrated Manufacturing, Journal of Mechanical Engineering Science, Journal of Testing and Evaluation, Sustainability journal, Machines journal, Metals journal, Actuators journal, Systems journal, FME Transactions journal, and Technological Sustainability journal*. We are grateful to the authors for their contributions and would like to acknowledge the FAIM steering committee, advisory board committee, honorary chairs, the scientific committee members, and manuscript reviewers for their significant efforts, continuous support, sharing their expertise, and conducting manuscript reviews. Manuscript reviewers came from various locations around the world, performing 1339 reviews in total. With such effort and toughness, the high standards of the papers included in the FAIM program have been kept.

Special thanks to FAIM 2023's invited speakers: Jiju Antony (*Professor, Khalifa University, Abu Dhabi, UAE*), Daryl Powell (*Chief Scientist at SINTEF, Norway*), Marcello Pellicciari (Professor, *Director of the PhD School "E4E-Engineering for Economics, Economics for Engineering", University of Modena and Reggio Emilia, Modena, Italy*), Rodrigo Martins (*Professor, Nova School of Science and Technology, Lisboa, Portugal*), Alcibíades Guedes (*Professor at Faculty of Engineering, University of Porto, President*

of the Board & CEO at INEGI, Porto, Portugal), and Pedro Carreira (*CEO at Continental Mabor, Lousado, Portugal*).

The book *Flexible Automation and Intelligent Manufacturing: Establishing Bridges for More Sustainable Manufacturing Systems—Proceedings of FAIM 2023* has been organized in two LNME volumes. Volume 1 is mainly devoted to Mechanical Engineering, Robotics, Automation, Manufacturing Processes and Materials Processing, while Volume 2 is mainly focused on Industrial Management, Digital Transformation, Industry 4.0/5.0, Human Factors, Logistics, Sustainability, and related matters. In both volumes, the papers have been organized by topics, providing to the reader an excellent set of papers regarding each topic.

We appreciate the partnership with Springer, ConfTool, and our sponsors for their fantastic support during the preparation of FAIM 2023. Thank you very much to the FAIM 2023 organizing team, whose hard work was crucial to the success of the FAIM 2023 conference.

May 2023

Francisco J. G. Silva
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