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Editors

Industry 4.0 and Advanced Manufacturing

Proceedings of I-4AM 2022

 Springer

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Preface

Industry 4.0 is about using connected intelligence to usher in greater productivity, quality, flexibility, safety and resource utilisation across manufacturing enterprises, in which advanced manufacturing such as Robotics or Additive Manufacturing plays a critical role.

The collection of papers in this book volume constitutes the Proceedings of the Second International Conference on Industry 4.0 and Advanced Manufacturing (I-4AM 22) held online at the Indian Institute of Science, Bangalore, India, during 10–11 January 2022. I-4AM 22 is the second in a series of biennial conferences held in India to bring together all stakeholders in manufacturing and Industry 4.0, in particular, those in academia and industry in both India and abroad, for them to deliberate on the nature, needs, challenges, opportunities, problems and solutions in this transformational area of endeavour.

I-4AM 22 was hosted online in Bangalore, the “silicon plateau” of the world, with the second fastest-growing community of start-ups, many of which are exploring emerging technologies such as IoT, IIoT, digital twins, sensor networks, I4.0 and so on to design new products, systems and services. The theme for I-4AM 22 was aligned with this ambience. A specific focus of this conference is to provide a platform for exploring avenues for creating a vision of, and enablers for sustainable, affordable and human-centric Industry 4.0 and to showcase cutting-edge practice, research and educational innovation in this crucial and rapidly evolving area.

Seventy-Seven full papers were submitted, which were reviewed by experts from the I-4AM 2022 International Programme Committee comprising 75 members from 13 countries spanning 5 continents. Finally, 41 full papers, authored by 119 researchers from 4 countries spanning 2 continents were selected for presentation at the conference and for publication as chapters in this book. I-4AM has grown, starting from a humble beginning in 2019 with 28 papers to the current 41 papers with over 140 people who attended the conference.

I-4AM 22 had 41 papers presentations followed by discussion. It had eight academic keynotes from prominent researchers and practitioners from around the world such as Diane J Mynors from Brunel University London, UK, Paulo Bartolo from Nanyang Technological University (NTU), Singapore, S N Omkar from Indian

Institute of Science, Bangalore, India, Soundar Kumara from Pennsylvania State University, USA, Satyandra K. Gupta from University of Southern California, USA, Seeram Ramakrishna from National University of Singapore, Singapore, Ashutosh Tiwari from The University of Sheffield, UK, and Manoj Kumar Tiwari from NITIE Mumbai.

It had two Industrial keynotes from prominent industry and organisations around India, such as Giridhar M Prabhakar from Siemens Technology and Services Limited, India, and Ms. Nidhi Chhibber from DHI GoI, India. It had three panel discussions: “Industry needs for I-4.0 & AM”; “Manufacturing Needs of the strategic sector”; and “Industry needs for training and education in manufacturing”. Over thirty thought leaders from industry, academia and policy sectors participated in the panel discussions.

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About This Book

This book, *Industry 4.0 and Advanced Manufacturing—Proceedings of I-4AM 2022*, focuses on the following topics:

- Controls, Autonomous Systems, Robotic
- Digital Manufacturing
- Industry 4.0
- Materials Processing and Joining
- Policy and Entrepreneurship
- Supply Chains
- Sustainable Manufacturing

On behalf of the Steering Committee, Advisory Committee, Organising Committee and Co-chairs, we thank all the authors, delegates, institutions and organisations that participated in the conference. We also thank the members of the International Programme Committee for their support in reviewing the papers for I-4AM 22, which is essential for maintaining the quality of the conference, and for their support in helping us put this book together.

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Bengaluru, India

Amaresh Chakrabarti
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