Advances in Intelligent Systems and Computing 1350

Jessnor Arif Mat Jizat · Ismail Mohd Khairuddin · Mohd Azraai Mohd Razman · Ahmad Fakhri Ab. Nasir · Mohamad Shaiful Abdul Karim · Abdul Aziz Jaafar · Lim Wei Hong · Anwar P. P. Abdul Majeed · Pengcheng Liu · Hyun Myung · Han-Lim Choi · Gian-Antonio Susto *Editors* 

# Advances in Robotics, Automation and Data Analytics

Selected Papers from iCITES 2020



# Advances in Intelligent Systems and Computing

Volume 1350

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### Preface

The International Conference on Innovative Technology, Engineering and Sciences 2020 (iCITES 2020), is the second edition of the conference series organized by Universiti Malaysia Pahang through its Alumni Society in an effort to promote key innovation in the following overarching themes and individual symposia, i.e. green and frontier materials, innovative robotics and automation, renewable and green energy, sustainable manufacturing as well as data analytics. The conference is aimed at building a platform that allows relevant stakeholders to share and discuss their latest researches, ideas and survey reports from theoretical to practical standpoint of the aforementioned fields.

ICITES2020 received more than 170 submissions. All submissions were reviewed in a single-blind manner, and the best 40 papers recommended by the reviewers are published in this volume. The editors would like to thank all the authors who submitted their papers as the papers are of good quality and represented good progress in industrial and robotic vision, motion control, autonomous mobile robots, intelligent sensors and actuators, multi-sensor fusion, deep learning and approaches and data processing.

The editors also would like to thank Assoc. Prof. Han-Lim Choi, Jamie Steel, Dr. Rabiu Muazu Musa, Dr. Miles Stopher, Assoc. Prof. Dr. Kazem Reza Kashyzadeh, Jee Kwan Ng for delivering their keynote speeches at the conference. They had to bring a new perspective on cutting-edge issues especially in the fields of robotics, automation and data analytics.

The editors hope that readers find this volume informative. We thank Springer for undertaking the publication of this volume. We also would like to thank the conference organization staff and the members of the international program committees for their hard work.

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