

Learning and Analytics in Intelligent Systems

Volume 7

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Innovation in Information Systems and Technologies to Support Learning Research

Proceedings of EMENA-ISTL 2019

 Springer

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Preface

This book contains a selection of papers accepted for presentation and discussion at the third edition of International Conference Europe, Middle East and North Africa on Information System Technology and Learning Researches 2019 (EMENA-ISTL'19). This conference had the support of the University Mohamed First Oujda, Morocco; College of Computers and Information Technology, Taif University, Taif, Saudi Arabia; Institute of Artificial Intelligent Systems and Behavioural Science (ISCIAC), Atlantica; and School of Management Sciences, Health, IT & Engineering Lisbon, Portugal.

EMENA-ISTL'19 conference has two aims; first, it provides the ideal opportunity to bring together professors, researchers, and high education students of different disciplines, discusses new issues, and discovers the most recent developments, researches, and trends in information and communication technologies, emerging technologies, and security to support learning. Second goal is to focus on to boost future collaboration and cooperation between researchers and academicians from Europe, Middle East, and North Africa, and universities from all over the world.

The international program committee are from more than 60 countries around the world; EMENA-ISTL'19 was composed of a multidisciplinary group of experts and those who are intimately concerned with information systems and communication technologies, artificial intelligence, big data analytics and applications, intelligent data systems, machine learning, and security. They have had the responsibility for evaluating, in a 'blind-review' process, the papers received for each of the main themes proposed for the conference: (A) information systems technologies to support education; (B) education in science, technology, engineering and mathematics; (C) emerging technologies in education learning innovation in digital age; (D) software systems, architectures, applications and tools; (E) multimedia systems and applications; (F) computer communications and networks; (G) IoT, smart cities and people, wireless sensor and ad hoc networks; (H) organizational models and information systems and technologies; (I) human-computer interaction; (J) computers and security, ethics, and data forensic; (K) health informatics and medical informatics security; (L) information and

knowledge management; (M) big data analytics and applications, intelligent data systems, and machine learning; (N) artificial intelligence, high-performance computing; (O) mobile, embedded, and ubiquitous systems; (P) language and image processing, computer graphics and vision; (Q) interdisciplinary field of fuzzy logic and data mining; (R) bioinformatics and computational biology, (S) intelligent robotics and multi-agent systems; and (T) information storage, indexing, and retrieval.

EMENA-ISTL'19 received contributions from 48 countries around the world. The papers accepted for presentation and discussion at the conference are published by Springer (this book) and by EMENA-ISTL'19 (another e-book) and will be submitted for indexing by ISI, Ei Compendex, SCOPUS, DBLP and/or Google Scholar, among others. Extended versions of selected best papers will be published in relevant journals, including SCI/SSCI and Scopus indexed journals.

We acknowledge all those who contributed to the staging of EMENA-ISTL'19 (authors, committees, and sponsors); their involvement and support are very much appreciated.

November 2019

Mohammed Serrhini
Sultan Aljhdali
Carla Silva

The original version of the book was revised: The affiliation of the volume editor “Carla Silva” has been updated. The correction to the book is available at https://doi.org/10.1007/978-3-030-36778-7_70

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**Correction to: Innovation in Information Systems
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