Lecture Notes in Business Information Processing 405

Series Editors

More information about this series at http://www.springer.com/series/7911

Adiel Teixeira de Almeida ·
Danielle Costa Morais (Eds.)

Innovation for Systems Information and Decision

Second International Meeting, INSID 2020
Recife, Brazil, December 2–4, 2020
Proceedings

🐎 Springer

Editors
Adiel Teixeira de Almeida 🄳
Federal Univ of Pernambuco
Recife, Pernambuco, Brazil

Danielle Costa Morais 🄳
Departamento de Engenharia de Producao
Universidade Federal de Pernambuco
Recife, Pernambuco, Brazil

Preface

The INnovation for Systems Information and Decision meeting (INSID) is an event (http://insid.events) linked to the international network INCT-INSID (http://insid.org.br). This network involves academics and practitioners from different countries, bringing together outstanding researchers from around the world in the field of Information Systems and Decision.

The INSID meetings have provided a stimulating environment for the dissemination of state-of-the-art knowledge about innovation for systems, information, and decision. This broad theme is transversely related to many areas, particularly to operational research, management engineering (or production engineering), including also, system engineering (and engineering in general), management science, computer science, and their interdisciplinary related areas. These meetings have allowed discussions among participants as well as the exchange of ideas and critical comments for further improvement since 2008, under the acronym SIDS.

INSID 2020 should have been held at the Federal University of Pernambuco, in Recife-Pernambuco, Brazil, during December 2–4, 2020. However, due to the COVID-19 pandemic, it took place virtually. This was the first time that the event happened in an online format since 2008. However, this was not the only reason it was a historic meeting. This is the first volume of the INSID meeting included in the *Lecture Notes in Business Information Processing* (LNBIP) series.

In total, 84 papers were approved for presentation covering the main topics related to themes and areas of interest of the meeting as follows: Methodological advances in decision making and aid; decision models in the environmental context; decision models in the energy context; decision models in the service systems; and, potential applications of decision and negotiation models. After a thorough review process, 8 of these papers were selected for inclusion in this volume entitled *INnovation for Systems Information and Decision: Models and Applications*.

These selected papers reflect methodological improvements and advances in Multicriteria Decision-Making/Multicriteria Decision-Aid (MCDM/MCDA) oriented toward real-world applications, contributing to the understanding of relevant developments of current research on, and future trends of, innovation for systems, information, and decision.

The first paper by Danielson and Ekenberg explores and tests a robust multicriteria weight generating method under uncertainty covering a wide set of decision situations and exemplify its application with a problem of selecting strategies for combatting COVID-19. Then, a paper by von Nitzsch, Tönsfeuerborn, and Siebert introduces the ENTSCHEIDUNGSNAVI, a multi-criteria decision support system, which besides the basic functionalities of a decision support system, provides training to improve the user's decision-making skills. The third paper by Angelo and Lins deals with a combination of Soft and Hard Operational Research (OR) presenting a multimethodology

named Complex Holographic Assessment of Paradoxical Problems (CHAP^2) applied to a complex health system.

Zaraté presents the results of multicultural experiments in order to see whether decision-makers feel comfortable with shared preferences and how the need to use private preferences could be seen using a multicriteria Group Decision Support System (GDSS) called GRUS. Eufrazio and Costa propose a synthetic index of quality life for OECD countries called Synthetic Better Life Index (SBLI). It follows a study by Xu, Liu, Kilgour, and Hipel, which presents a new algebraic definition to facilitate calculating of Stackelberg stability in a graph model for conflict resolution with two decision-makers, and a superpower military confrontation is used to illustrate how Stackelberg stability can be applied to a real-world problem.

Fossile, Costa, and Lima deal with a study on the development of a sustainable measurement model of renewable energy sources, aiming to identify the most adequate energy source to be used in Brazilian ports. Finally, the eighth paper by Cunha, Mota, de Almeida, Frej, and Roselli presents an application related to security in the Brazilian Federal Police, applying Value Focused Thinking with the FITradeoff method for the assignment of priorities regarding special operations.

The preparation of this volume required the efforts and collaboration of many people. In particular, we would like to thank the Steering Committee and Program Committee for their contributions to the INSID 2020. Special thanks also go to all members of the INCT-INSID network. We are also very grateful to the following reviewers for their timely and informative additional reviews: Marc Kilgour, Liping Fang, Ana Paula Gusmão, Mischel Carmen Belderrain, Eduarda Frej, Leandro Rego, Maisa M. Silva, Carolina Lino, Luciana Hazin, and Ana Paula Cabral.

We would also like to thank Ralf Gerstner, Alfred Hofmann, Christine Reiss, Guido Zosimo-Landolfo, and Anna Kramer at Springer for the excellent collaboration.

Finally, we hope readers will find the content of this book useful and stimulating for further developments and applications of innovation for systems, information, and decision.

December 2020   Adiel Teixeira de Almeida
                                                                      Danielle Costa Morais

Organization

Program Chair

Danielle Costa Morais   Universidade Federal de Pernambuco, Brazil

Steering Committee

Adiel Teixeira de Almeida	Universidade Federal de Pernambuco, Brazil
Keith Hipel	University of Waterloo, Canada
Love Ekenberg	Stockholm University,Sweden
Marc Kilgour	Wilfrid Laurier University, Canada
Pascale Zarate	Université Toulouse 1 Capitole, France
Ralph Keeney	Duke University and University of Southern California, USA
Roman Slowinski	Poznań University of Technology, Poland
Rudolf Vetschera	University of Vienna, Austria
Petr Ekel	Pontifícia Universidade Católica do Minas Gerais, Brazil
Marcos Pereira Estellita Lins	Universidade Federal do Rio de Janeiro, Brazil
Helder Gomes Costa	Universidade Federal Fluminense, Brazil
Mischel Carmen Neyra Belderrain	Instituto Tecnológico de Aeronáutica, Brazil
Danielle Costa Morais	Universidade Federal de Pernambuco, Brazil

Program Committee

Alexandre Bevilacquea Leoneti	Universidade de São Paulo, Brazil
Ana Paula Cabral Seixas Costa	Universidade Federal de Pernambuco, Brazil
Ana Paula Henriques de Gusmã	Universidade Federal de Sergipe, Brazil
Annibal Parracho Sant'Anna	Universidade Federal Fluminense, Brazil
Carlos Francisco Simões Gomes	Universidade Federal Fluminense, Brazil
Caroline Maria de Miranda Mota	Universidade Federal de Pernambuco, Brazil
Cristiano Alexandre V. Cavalcante	Universidade Federal de Pernambuco, Brazil
Cristiano Torezzan	Universidade Estadual de Campinas, Brazil

Daniel Aloise	Polytechnique Montréal, Canada
Haiyan Xu	Nanjing University of Aeronautics and Astronautics, China
Hannu Nurmi	University of Turku, Finland
João Carlos Correia Baptista Soares de Mello	Universidade Federal Fluminense, Brazil
Johannes Siebert	MCI Management Center Innsbruck, Austria
José Rui Figueira	Technical University of Lisbon, Portugal
Leandro Chaves Rêgo	Universidade Federal do Ceará, Brazil
Liping Fang	Ryerson University, Canada
Luciana Hazin Alencar	Universidade Federal de Pernambuco, Brazil
Luiz Bueno da Silva	Universidade Federal da Paraíba, Brazil
Luiz César Ribeiro Carpinetti	Universidade de São Paulo, Brazil
Maria Teresinha Arns Steiner	Pontifícia Universidade Católica Paraná, Brazil
Mariana Rodrigues de Almeida	Universidade Federal do Rio Grande do Norte, Brazil
Salvatore Greco	University of Catania, Italy
Sérgio Eduardo Gouvêa da Costa	Pontifícia Universidade Católica Paraná, Brazil
Vanessa Batista de Sousa Silva	Universidade Federal de Campina Grande, Brazil

Contents