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The series “Advances in Intelligent Systems and Computing” contains publications on theory, applications, and design methods of Intelligent Systems and Intelligent Computing. Virtually all disciplines such as engineering, natural sciences, computer and information science, ICT, economics, business, e-commerce, environment, healthcare, life science are covered. The list of topics spans all the areas of modern intelligent systems and computing.

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Computational Intelligence in Data Mining

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on CIDM, 10–11 December 2016

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Preface

In this decade, with advancements in data mining, many new models and tools in discovering knowledge and extracting intelligence brought forth revolutionary developments with the help of computational intelligence techniques. The present scenario of storage of the amount of data is quite huge in the modern database due to the availability and popularity of Internet. Thus, information needs to be summarized and structured in order to maintain effective decision-making. When the quantity of data, dimensionality, and complexity of the relations in the database are beyond human capacities, there is a requirement for intelligent data analysis techniques, which could discover useful knowledge from data. While data mining evolves with innovative learning algorithms and knowledge discovery techniques, computational intelligence harness the results of data mining for becoming more intelligent than ever. In the present scenario of computing, computational intelligence is playing a major role in solving many real world complex problems. The 3rd International Conference on “Computational Intelligence in Data Mining (ICCIDM 2016)” organized by Kalinga Institute of Industrial Technology (KIIT), Bhubaneswar, Odisha, India on 10 and 11 December 2016. ICCIDM is an international forum for representation of research and developments in the fields of data mining and computational intelligence. More than 300 prospective authors had submitted their research papers to the conference. This time the editors have selected 79 papers after double-blind peer-review process by experienced subject experts chosen from the country and abroad. The proceedings of ICCIDM are a mix of papers from some latest findings and research of the authors. It is a great honor for us to edit the proceedings. We have enjoyed considerably working in cooperation with the International Advisory, Program, and Technical Committees to call for papers, review papers, and finalize papers that are included in these proceedings.

This International Conference ICCIDM aims at encompassing a new breed of engineers, technologists making it a crest of global success. All papers are focused on thematic presentation areas of the conference and they have provided ample opportunity for presentation in different sessions. This year’s program includes exciting collections of contributions resulting from a successful call for papers. The selected papers have been divided into thematic areas including both review and

research papers and which highlight the current focus of computational intelligence techniques in data mining. The conference aims at creating a forum for further discussion for an integrated information field, incorporating a series of technical issues in the frontier analysis and design aspects of different alliances in the related field of intelligent computing and others. Therefore, the call for paper was on three major themes such as methods, algorithms, and models in data mining and machine learning, advance computing and applications. Further the papers discussing the issues and applications related to the theme of the conference were also welcomed in ICCIDM.

We hope readers will enjoy the collection papers published in this volume.

Sambalpur, India
Rourkela, India

Himansu Sekhar Behera
Durga Prasad Mohapatra

Acknowledgements

The 2016 edition of ICCIDM has drawn nearly eighty research articles authored by numerous academicians, researchers, and practitioners throughout the world. We thank all of them for sharing their knowledge and research findings on an international platform like ICCIDM and thus contributing towards producing such a comprehensive conference proceedings of ICCIDM.

The level of enthusiasm displayed by the members of organizing committee right from day one is commendable. The extraordinary spirit and dedication shown by the organizing committee in every phase throughout the conference deserves sincere thanks from the bottom of my heart.

After two successful versions of ICCIDM, it is an honor for us to edit the proceedings of this third series of ICCIDM. We are fortunate to work in cooperation with a brilliant international as well as national Advisory, Program, and Technical Committees, comprising eminent academicians, to call, review, and finalize the papers for the proceedings.

We would like to express our heartfelt gratitude and obligations to the benign reviewers for sparing their valuable time and putting in effort to review the papers in a stipulated time and providing their valuable suggestions and appreciation in improving presentation, quality, and content of these proceedings. The eminence of these papers is an accolade not only to the authors but also to the reviewers who have guided towards perfection.

Last but not least, the editorial members of Springer Publishing deserve a special mention and we offer our sincere thanks to them not only for making our dream come true in the shape of these proceedings, but also for its hassle-free and in-time publication in the reputed Advances in Intelligent Systems and Computing Series.

The ICCIDM conference and proceedings are a credit to a large group of people and everyone should be proud of the outcome.

About the Conference

The International Conference on “Computational Intelligence in Data Mining” (ICCIDM) has become one of the reputed conferences in data mining and its applications amongst the researchers across the globe after its two successful versions in 2014 and 2015. ICCIDM 2016 aims to facilitate cross-cooperation across diversified regional research communities within India as well as with other international regional research programs and partners. Such active discussions and brainstorming sessions among national and international research communities are the need of the hour as new trends, challenges, and applications of computational intelligence in the field of science, engineering and technology are cropping up by each passing moment. The 2016 edition of ICCIDM is an opportune platform for researchers, academicians, scientists, and practitioners to share their innovative ideas and research findings, which will go a long way in finding solutions to confronting issues in related fields.

The conference aims to:

- Provide a sneak preview into the strengths and weakness of trending applications and research findings in the field of computational intelligence and data mining.
- Enhance the exchange of ideas and achieve coherence between the various computational intelligence methods.
- Enrich the relevance and exploitation experience in the field of data mining for seasoned and naïve data scientists.
- Bridge the gap between research and academics so as to create a pioneering platform for academicians and practitioners.
- Promote novel high-quality research findings and innovative solutions to the challenging problems in intelligent computing.
- Make a fruitful and effective contribution towards the advancements in the field of data mining.
- Provide research recommendations for future assessment reports.

At the end, we hope the participants will enrich their knowledge with new perspectives and views on current research topics from leading scientists, researchers and academicians around the globe, contribute their own ideas on important research topics like data mining and computational intelligence, as well as will collaborate with their international counterparts.

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