IFIP Advances in Information and Communication Technology 717

Editor-in-Chief

Kai Rannenberg, Goethe University Frankfurt, Germany

Editorial Board Members

IFIP Advances in Information and Communication Technology

The IFIP AICT series publishes state-of-the-art results in the sciences and technologies of information and communication. The scope of the series includes: foundations of computer science; software theory and practice; education; computer applications in technology; communication systems; systems modeling and optimization; information systems; ICT and society; computer systems technology; security and protection in information processing systems; artificial intelligence; and human-computer interaction.

Edited volumes and proceedings of refereed international conferences in computer science and interdisciplinary fields are featured. These results often precede journal publication and represent the most current research.

The principal aim of the IFIP AICT series is to encourage education and the dissemination and exchange of information about all aspects of computing.

More information about this series at https://link.springer.com/bookseries/6102

Mieczyslaw Lech Owoc ·
Felix Enigo Varghese Sicily ·
Kanchana Rajaram · Prabavathy Balasundaram
Editors

Computational Intelligence in Data Science

7th IFIP TC 12 International Conference, ICCIDS 2024
Chennai, India, February 21–23, 2024
Revised Selected Papers, Part I

Springer

Editors
Mieczyslaw Lech Owoc
Wroclaw University of Economics and Business
Wrocław, Poland

Felix Enigo Varghese Sicily
Sri Sivasubramaniya Nadar College of Engineering
Chennai, Tamil Nadu, India

Kanchana Rajaram
Sri Sivasubramaniya Nadar College of Engineering
Chennai, Tamil Nadu, India

Prabavathy Balasundaram
Sri Sivasubramaniya Nadar College of Engineering
Chennai, Tamil Nadu, India

ISSN 1868-4238 ISSN 1868-422X (electronic)
IFIP Advances in Information and Communication Technology
ISBN 978-3-031-69981-8 ISBN 978-3-031-69982-5 (eBook)
https://doi.org/10.1007/978-3-031-69982-5

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

The International Conference on Computational Intelligence in Data Science (ICCIDS) is an annual conference organized by the Department of Computer Science and Engineering, Sri Sivasubramaniya Nadar College of Engineering. The seventh edition of the conference, ICCIDS 2024, took place during February 21−23, 2024. The International Federation for Information Processing (IFIP) has been the organizing body and technical co-sponsor for ICCIDS for the past four years.

ICCIDS 2024 offered a platform for researchers, scientists, engineers, and academics from across the globe to network and exchange their most recent, unique research experiences along with the latest advancements and trends in Artificial Intelligence (AI). The conference theme included major areas of AI application, such as computer vision, natural language processing, speech processing, and integration with IoT and cyber security. The event drew both foreign and national authors who showcased their technical skills through written contributions and presentations.

The conference received 341 submitted papers, of which 21% were accepted for presentation after a double-blind review process in which each submission received 2 or 3 reviews.

The first day of the conference commenced with an inauguration ceremony with the release of the souvenir of ICCIDS 2024. It was followed by two keynote talks. The first talk was on *Localization and Clustering in Wireless Sensor Networks*, by *Saroja P. Kanchi, Kettering University, USA*. The second talk was delivered on *Impact of Fakes on Sustainable Development Actions - Trusted Knowledge as Counteraction* by *Mieczysław Lech Owoc, Wrocław University of Economics & Business, Poland*. Presentations of the accepted papers were organized as five tracks as follows:

1. Applications of AI/ML in NLP
2. Applications of AI/ML in Image Processing
3. Application of AI/ML in KDM, Cloud Computing and Security
4. Data Analytics
5. Applications of ML

There were four parallel tracks, namely 1, 2, 3, & 4, with 6 paper presentations respectively coordinated by the session coordinators with evaluation by the session chairs.

On the second day of the conference, there were two keynote talks, one hands-on session followed by paper presentations. The first keynote talk was on *Self-Supervised Learning: An Efficient Technique to Process Unlabeled Image Data* by *Mayuri Mehta* from *Sarvajanik College of Engineering & Technology, India*. The second talk was on *Gen-AI and the Next Wave of Democratization of IT* by *Kausikram Krishnasayee*, *Kissflow*, *India*. There was a Hands-On Session on *AI and XAI-based Use Cases in Healthcare using Python* by *Mayuri Mehta* from *Sarvajanik College of Engineering & Technology, India*. There were two sessions for parallel tracks 2 and 3 with 12 paper

presentations each coordinated by the session coordinators with evaluation by the session chairs.

On the third day of the conference, there were two keynote talks followed by paper presentations. The first keynote talk was delivered by *Arun Raj Kumar P.*of *NIT Calicut* on *Securing Tomorrow: Unveiling the Synergy of Computational Intelligence and Data Science in Network Security*. The second talk was on *Cloud-Edge Coopetition: A Win-Win Partnership* by *Zakaria Maamar, University of Doha for Science and Technology, Qatar*. There were four tracks, 1, 2, 4, and 5, with 8, 8, 7, and 8 paper presentations respectively coordinated by the session coordinators with evaluation by the session chairs.

We acknowledge the invaluable assistance of the program and technical committee members. A complete list of track chairs and track PC members can be found in the next pages. Most reviewers provided detailed and constructive comments which were valuable for the authors to continue improving their papers, even if the submissions were not selected for the conference.

Given the high-quality work done by authors, reviewers, and track chairs, we are confident that the ICCIDS 2024 proceedings capture the current state of the art of research in the field of AI and knowledge management and will have significant impact on the research community in the longer term.

February 2024

Mieczyslaw Lech Owoc
Kanchana Rajaram
Felix Enigo Varghese Sicily
Prabavathy Balasundaram

Organization

Chief Patron

Shiv Nadar	SSN Institutions, India

Patron

Kala Vijayakumar	SSN Institutions, India

General Chairs

Annamalai Veiravan	Sri Sivasubramaniya Nadar College of Engineering, India
Radha Sankararajan	Sri Sivasubramaniya Nadar College of Engineering, India
Ramasamy Perumalsamy	Sri Sivasubramaniya Nadar College of Engineering, India

Conference Chairs

Kanchana Rajaram	Sri Sivasubramaniya Nadar College of Engineering, India
Felix Enigo Varghese Sicily	Sri Sivasubramaniya Nadar College of Engineering, India
Prabavathy Balasundarm	Sri Sivasubramaniya Nadar College of Engineering, India

Program Committee

Eunika Mercier-Laurent	University of Reims Champagne-Ardenne, France
Mieczysław L. Owoc	Wrocław University of Economics and Business, Poland
Dominique Verdejo	IFIP Chair, WG 12.13 - AI for Global Security, France
Zahia Guessoum	Université de Reims Champagne-Ardenne, France
Nada Matta	Université de technologie de Troyes, France

Technical Program Committee

Chutisant Kerdvibulvech	NIDA, Thailand
Yanhui Guo	University of Illinois Springfield, USA
Leung, Yiu Wing	Hong Kong Baptist University, China
Kaliappan Ravindran	City College of New York, USA

B. Vijayakumar	BITS Pilani, Dubai Campus, UAE
Femilda Josephin	İstinye University, Turkey
Elluri Lavanya	Texas A & M University, USA
Arun A.	General Motors R&D, USA
Senthilnathan C.	Virtusa, USA
Latha Karthika	Brandupwise Marketing, New Zealand
Mittapalle Kiran	Aalto University, Finland
Lakshmi Divya J.K.	Microsoft, USA
R. Ishwarya	TD Bank, Canada
Jyothi C. T.	CTS, USA
Arun Raj Kumar P.	National Institute of Technology, Calicut, India
Zakaria Maamar	University of Doha for Science & Technology, Qatar
Chandrasekar	Google LLC, USA
Seshakumar	Doordash.inc, California
Malligeswari N.	Bank of America, USA
Nirmala Balakrishnan	Luminous Computing, USA
Sridharan C. S.	Thiagarajar College of Engineering, India
R. Uma	Amazon, USA
Mayuri Mehta	Sarvajanik College of Engineering &Technology, India
Saroja P. Kanchi	Kettering University, USA
Ravikumar S.	American Family Insurance, USA
Thangmani Paulchamy	Siva Cerulean Technologies, USA
Kumaradevan P.	University of Alberta, Canada
S. Selvakumar	NIT Trichy, India
Sreenivasan R. R.	Bowie State University, USA
Kausikram Krishnasayee	Kissflow, India
Sriram Kailasam	IIT Mandi, India
Umarani Jayaram	IITDM, India
Sheerazudeen S.	NIT Calicut, India
Vani V.	NIT Puducherry, India
Padmavathy R.	NIT Warangal, India
Varalakshmi P.	Anna University, India
Gunasundari R.	Puducherrry Technological University, India
Latha Parthiban	Pondicherry University, India
Bhoopathy Bagan	Anna University, India
Rahul Raman	IITDM, India
Mary Saira Banu	NIT Trichy, India
T. M. Navamani	VIT Vellore
V. Gomathi	NEC, Kovilpatti, India
Amma N. G. Bhuvaneswari	VIT Chennai, India
B. Kishore	Dr. Mahalingam College of Engineering & Technology, India
G. Victo Sudha	Dr. M.G.R. Educational and Research Institute, India
Arun Raj Kumar	NIT Calicut, India
Chandrakumar	Thiagarajar College of Engineering, India
Geetha Narayanan	Coimbatore Institute of Technology, India

Mishra Priyanka	VIT Chennai, India
Kanakaraj	Mepco Schlenk Engineering College, India
Palani Shanmugam	Rajalaksmi Engineering College, India
B. Kamala	Sri Sairam Engineering College, India
N. Ramya	Sri Sairam Engineering College, India
A. R. Vasudevan	NIT Calicut, India
Surendiran	NIT Puducherry, India
J. M. Nandhini	Anna University, India
N. Prakash	B.S. Abdur Rahman Crescent Institute of Science and Technology, India
Parthasarathy S.	Thiagarajar College of Engineering, India
S. T. Padmapriya	Thiagarajar College of Engineering, India
N. Gopinath	Sri Sairam Engineering College, India
Sahayam Subin	SNU Chennai, India
Dhalayakumar	SNU Chennai, India

Session Coordinators

S. Angel Deborah	Sri Sivasubramaniya Nadar College of Engineering, India
Y. V. Lokeswari	Sri Sivasubramaniya Nadar College of Engineering, India
V. Balasubramanian	Sri Sivasubramaniya Nadar College of Engineering, India
S. Raghvendra Kumar Sakali	Sri Sivasubramaniya Nadar College of Engineering, India
S. Lakshmi Priya	Sri Sivasubramaniya Nadar College of Engineering, India
M. Saritha	Sri Sivasubramaniya Nadar College of Engineering, India
S. Rajalakshmi	Sri Sivasubramaniya Nadar College of Engineering, India
Nilu R. Salim	Sri Sivasubramaniya Nadar College of Engineering, India
S. Saraswathi	Sri Sivasubramaniya Nadar College of Engineering, India
A. Beulah	Sri Sivasubramaniya Nadar College of Engineering, India
S. M. Dhannya	Sri Sivasubramaniya Nadar College of Engineering, India
K. R. Sarathchandran	Sri Sivasubramaniya Nadar College of Engineering, India

Session Chairs

Saroja P. Kanchi	Kettering University, USA

Kishore B.	Mahalingam College of Engineering & Technology, India
Mieczysław Lech Owoc	Wrocław University of Economics and Business, Poland
Mayuri Mehta	Sarvajanik College of Engineering & Technology, India
B. Latha	Sri Sairam Engineering College, India
Ayesha	VIT University, India.
Noor Mahammad S. K.	IIITDM Kancheepuram, India
Kaja Mohideen	B.S. Abdur Rahman Crescent Institute of Science and Technology, India
Rahul Raman	IIITDM Kancheepuram, India
Arun Raj Kumar P.	NIT Calicut, India
Sriram M.	SDE1, Samsung Ecommerce, India

PC Chairs

Mieczysław Lech Owoc	Wrocław University of Economics and Business, Poland
Dominique Verdejo	IFIP Chair, WG 12.13 - AI for Global Security, France
Zahia Guessoum	University of Reims Champagne-Ardenne, France
Nada Matta	University of Technology of Troyes, France
Eunika Mercier	University of Reims Champagne-Ardenne, France
Mirnalinee Thanganadar Thangathai	Sri Sivasubramaniya Nadar College of Engineering, India
Kanchana Rajaram	Sri Sivasubramaniya Nadar College of Engineering, India
Felix Enigo Varghese Sicily	Sri Sivasubramaniya Nadar College of Engineering, India
Prabavathy Balasundarm	Sri Sivasubramaniya Nadar College of Engineering, India

Sponsors

Contents – Part I

Applications of AI/ML in Natural Language Processing

Applications of AI/ML in Image Processing

Contents – Part II