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Sankar K. Pal
Sabu M. Thampi
Ajith Abraham *Editors*

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Editors
Sankar K. Pal
Center for Soft Computing Research
Indian Statistical Institute
Kolkata, West Bengal, India

Ajith Abraham
Bennett University
Greater Noida, India

Sabu M. Thampi
School of Computer Science
and Engineering
Kerala University of Digital Sciences
Innovation and Technology (Digital
University Kerala)
Thiruvananthapuram, Kerala, India

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Preface

The 8th International Symposium on Intelligent Informatics (ISI'23) was held in Bengaluru (Bangalore), India, from December 18 to 20, 2023. ISI'23 provided a platform to share and discuss theoretical and practical developments in intelligent informatics. It was co-located with the International Conference on Applied Soft Computing and Communication Networks (ACN'23). The conference included keynote addresses, contributed papers, workshops, and tutorials. The event was organized by PES University, Bengaluru, and received technical support from the IEEE Signal Processing Society Bangalore Chapter and the IEEE Communications Society Bangalore Chapter.

This volume comprises 30 papers presented at the symposium and is organized into different sections, such as Computer Vision, Image Processing, Signal Processing, Machine Learning and Deep Learning Applications, Healthcare and Medical Diagnostics, Biotechnology and Environmental Applications, IoT Security and Data Encryption, and Quantum Computing and Intelligent Systems.

All submissions underwent evaluation based on their significance, novelty, and technical quality. A double-blind review process was conducted to ensure that the author names and affiliations were unknown to the Technical Program Committee (TPC).

We extend our gratitude to all the authors who contributed their papers to the success of ISI'23. We acknowledge the pivotal role played by PES University, Bengaluru, as the organizing institution, and express our thanks to the IEEE Signal Processing Society Bangalore Chapter and IEEE Communications Society Bangalore Chapter for their technical support. The dedication of the Local Organizing Committee members is commendable, as is the selfless contribution of time by the faculty, staff, and student volunteers who played vital roles in ensuring the success of ACN'23.

Lastly, we express our appreciation for the collaboration with our publisher, Springer, and extend our sincere thanks to Senior Editor Aninda Bose for their invaluable support.

Kolkata, India — Sankar K. Pal
Thiruvananthapuram, India — Sabu M. Thampi
Greater Noida, India — Ajith Abraham
December 2023

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About the Editors

Sankar K. Pal (Life Fellow, IEEE) received the first Ph.D. degree in radio physics and electronics from the University of Calcutta, Kolkata, India, in 1979, and the second Ph.D. degree in electrical engineering along with DIC from Imperial College, University of London, London, UK, in 1982. He is currently National Science Chair, Government of India, and President of the Indian Statistical Institute (ISI). He is also Distinguished Scientist and Former Director of ISI, Former Distinguished Professor of the Indian National Science Academy, and Former Chair Professor of the Indian National Academy of Engineering. He founded the Machine Intelligence Unit and the Center for Soft Computing Research: a national facility in the institute in Calcutta. In 1975, he joined ISI as CSIR Senior Research Fellow where he became Full Professor in 1987, Distinguished Scientist in 1998, Director in 2005–2010, and President in 2022–2024.

Sabu M. Thampi is a Professor at the School of Computer Science and Engineering, Digital University Kerala, Trivandrum, India. His current research interests include the Internet of Things (IoT), cognitive security, social networks, endpoint security, and smart cyber-physical systems. Sabu is also coordinating the Connected Systems and Intelligence (CSI) Lab at the University. He holds a Ph.D. in Computer Engineering from the National Institute of Technology Karnataka. Dr. Sabu has been actively involved in funded research projects and published papers in book chapters, journals, and conference proceedings. He has authored and edited a few books, as well as edited 45+ conference proceedings published by Springer in various series, as well as a few others published by IEEE, ACM, and Elsevier.

Ajith Abraham received his Ph.D. in Computer Science from Monash University, Melbourne, Australia. He has a Master of Science in Control and Automation from Nanyang Technological University, Singapore. He holds a bachelor's degree in electrical and electronic engineering from the University of Calicut, Kerala, India. He has over 32 years of industry and academic experience. His primary research is on developing advanced machine intelligence using hybridization of function approximation methods, approximate reasoning and global optimization methods focused on big

data analytics, understanding networks, information security, Web intelligence, decision support systems, the Internet of things, etc. He is Founding Director of Machine Intelligence Research Labs, a not-for-profit Scientific Network for Innovation and Research Excellence connecting industry and academia.

Preliminary Testing of a Color-based Test Kit Detector for Bioplastics

Farrah Wong[1[0000-0002-8685-7165]], Noor Fazilah Binti Rahmansyah[1], Sariah Abang[2], Kheau Chung[1], Aroland Kiring[1], Jamal Ahmad Dargham[1] and Rosalam Sarbatly[1]

[1] Faculty of Engineering, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia
[2] Faculty of Engineering, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak
[1] farrah@ums.edu.my

Abstract. Plastic was invented in 1907 by Leo Baekeland who is a Belgian-American Chemist. Since then, his creation has paved the way for the future of polymers. Nowadays, plastics come in different types with multitude of uses ranging from household storage purpose to medical packaging means. However, it also has a negative impact on humanity as well, particularly on the environment and bioplastics is noticeably would be the way forward to achieve a sustainable environment. Bioplastics is synthesized from biomass or other natural material as the new alternative to plastic as it degrades much faster. Eventually, a bioplastic testing kit will be necessary, especially in the market where the use of plastic will be regulated. A prototype test kit based on Arduino and a color sensor was developed to distinguish different plastic types based on their distinct color reactions to specific chemical reagents. The fundamental question was how to create a feasible way to distinguish between cellulose-based, starch-based, biodegradable, and conventional plastics and deal with the accompanying challenges. The reagents applied to the samples included iodine, iodine-CaCl2, and Schultze reagents. Notably, the cellulose-based and starch-based straw samples exhibited a dark purple color change with iodine and dark blue with iodine-CaCl2 and Schultze reagent. In contrast, starch-based singlet bags exhibited brown transforming into purple with iodine and Schultze reagents. Besides, biodegradable, and conventional plastics displayed no color changes with any reagents. The test kit has shown a promising way to assist consumers to make a more informed decision through a simple test.

Keywords: Bioplastics, Test Kit, Reagents.

1 Introduction

1.1 Bioplastics

Over the last decades, the market has developed various materials within various manufacturing fields; overtaking wood, glass, ceramic and metal, plastics have become an essential material in the manufacturing environment [1]. There is also an increasing impetus for bioplastics manufacturing, growing demand and the introduc-