

International Conference on Sustainable Communication Networks and Application (ICSCNA 2023)

15-17, November 2023 | Theni, India

Proceedings



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Organized by
Bharath Niketan Engineering College
Theni, Tamil Nadu, India



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https://icoscn.com/2023/ icscn.conf@gmail.com

Message from Principal

On behalf of Bharath Niketan Engineering College, I welcome all the participants and delegates to the International Conference on Sustainable Communication Networks and Application (ICSCNA 2023). Bharath Niketan Engineering College is committed to providing a unique learning environment in which students can learn and thrive as they prepare to face an increasingly competitive and globalized society. In our effort to raise the education standards, we continue to prepare student in order to meet the changing societal and industrial requirements. At Bharath Niketan Engineering College, we focus to teach not only academics but also the emerging industrial and technical skills to create a technological society. As an attempt, towards it ICSCNA 2023 focuses on exploring the communication networks, which helps people to function digitally all around the globe. I am happy to note that, the conference also has the objective to discuss and deliberate on the dynamics of creating sustainable technologies for a green future.

I appreciate all the staff, teachers, organisers and the students for their contribution in successfully organising and managing this event.

I welcome you all to Bharath Niketan Engineering College and hope that this conference will benefit all participants in exploring the conference topic and conversation, as well as gaining new ideas and collaboration for the future.

Dr. P. V. Arul KumarPrincipal,
Bharath Niketan Engineering College,India



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Message from Program Chair

It is a great pleasure for me to welcome you all to the International Conference on Sustainable Communication Networks and Application (ICSCNA 2023). This international conference aims to bring researchers from both academia and industries together to present the recent advances in the field of communication networks and sustainable applications. In this new conference series (ICSCNA), we are proud to present a strong technical program including 282 technical paper presentations, keynote talks, and the academic and industrial panel discussion including experts from various leading universities and companies.

Each and every paper received to the conference is carefully peer-reviewed by our dedicated conference technical program committee members and provided valuable feedback to authors to further enhance the quality of their research work. Each submission was evaluated based on three different criteria: technical content (research impact and results), novelty and presentation style. I would like to extend my heartfelt appreciation to the members of the technical program committee for dedicating their time and effort in giving a constructive input to the authors.

I would like to extend my gratitude to the conference chair and co-chair for their guidance and enormous contributions in organizing this conference event. Furthermore, I would like to thank the local arrangement chair and publications chairs for their contributions in bringing together this diversified conference program.

Finally, and most importantly, I would like to thank all the authors and technical paper presenters, the keynote presenters and the session chairs for their valuable contributions that make this event a grand success.

Dr. K. Senthil KumarProfessor/CSE,
Bharath Niketan Engineering College, India

58	Secure Sensitive Information on IoT using Machine Learning S. Nagendiran, R. Renugadevi, R. P. Anto Kumar, K. Sasirekha, R. Harini	360
59	Development of IoT-based Smart Home Application with Energy Management Prathyusha M R, Biswajit Bhowmik	367
60	Implementation of Extreme Learning Model for Cyber Security in IoT Networks S. Parvathi, T. Sushma, Anusree K, Venkata Syamala Raju Talari, Satya Nageswara Anirudh Dasari, V. Gokula Krishnan	374
61	Enhancement of Security in IoT using Modified AES Algorithm for IoT Applications P. Satyanarayana, Narasimhachary Sriramdas, Bondili Madhavi, Arun M, N. V. Phani Sai Kumar, V. Gokula Krishnan	380
62	DNN and Cryptography based Data Monitoring System for IoMT Environment S. Shivananda, M. Sathya, K. Janani, U. Arunkumar	387
63	Concurrent Architecture of Novel Scheduler for IoT based Sensor Networks Prachi C. Khanzode, Dinesh G. Harkut	395
64	IoT based Intelligent Warehouse Monitoring and Alerting System Sathya R, Arun Francis G, Thilagaraj M, Kottaimalai R	402
65	Milk Fever Detection Device for Cattle using IoT Gowrineni Jasmitha Chowdary, Seelam Kalpana, Bitra Ramya, Jajam Likhitha, Chaganti Venkata Vinod	407
66	Power Quality Monitoring of a Photovoltaic System Through IoT T. Meenakshi, R. Ramani, A. Karthikeyan, N. Suthanthira Vanitha, S. Murugan	413
67	Predictive Analytics for Stress Management in the Digital Workplace using IoT Shanthi K G, Rukmani Devi S, Sesha Vidhya S, Santhi S, Kalaiselvi A, Harinee G A	419
68	SalineSync: A Saline Level Monitoring ToT System Dnyaneshwar Kanade, Ameya Paldewar, Sanket Paliwal, Amol Palwe, Soham Panchal, Bhavesh Patil	423
69	Anomaly Detection of Smart City in IoT Cyberattacks based on Hybrid A-BiLSTM-CRF Method Amit Jaykumar Chinchawade, M. Kalaiselvi, T. Sathish Kumar, Yogendra Singh, S. Srisathirapathy, K. P. Yuvaraj	430
70	Towards Safer Roads: Development and Evaluation of an Alcohol-Impaired Driver Alert System Ranjeetsingh Suryawanshi, Vedant A. Sawant, Vishal P. Patil, Dhanashri D. Sonawane, Riddhi. S. Sonawane	436
71	Sensor Fusion Techniques for Enhanced Environmental Monitoring in IoT B. Nandhini, Karthika. S, Karthiyayini. S, Krishnaveni. K	445
72	Ro-Boat: IoT-based Non-Autonomous Garbage Collector Boat for Organic, Metal, and Non-Metal Waste Ammarullah Wijnayaka Digda, Natasya Riana Kurniadi, Rafael Three Goenawan, Sherine Angellina Hoswari, Lina Gozali, Erwin Siahaan	451
73	Hybrid Power Generation and Storage System for the Application of EV using IoT and Big Data Sahana. S, K. Sasikala	457
74	Design and Development of IoT Oriented Solar Powered Smart Home Controlling Mechanism R. Tamezheneal, K. Kajendran, V. Samuthira Pandi, Hemalatha S, D Shobana, J. Lakshmi Priya	463



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Certificate of Presentation

This is to certify that

Lina Gozali

has presented a paper entitled

Ro-Boat: IoT-based Non-Autonomous Garbage Collector Boat for Organic, Metal and Non-Metal Waste

in the three-day International Conference on Sustainable Communication Networks and Application held during 15-17, November 2023

Session Chair

Conference Chair

Dr. K. Pouncaj

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Ro-Boat: IoT-Based Non-Autonomous Garbage Collector Boat for Organic, Metal, and Non-Metal Waste

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Ro-boat is a prototype garbage collecting vessel which generally operates in aquatic environments such as rivers, lakes and seas. Innovated in the way it operates, Ro-Boat is designed to optimize the procedures to collect garbage, especially microplastic and reduce water pollution. The ship's hull is designed with a double hull type and the propulsion system of this ship uses a propeller, while the method of transporting waste used on Ro-Boat uses a conveyor belt with an adjustable speed. Ro-boat control system is supported by a remote control as a transmitter and the it is functionally designed in an easy way to use so that anyone can operate with ease. The dimensions of the Ro-boat are designed to be as minimal while still paying attention to the level of functionality of this ship in terms of waste transport capacity. Therefore, Ro-Boat focuses on technology that is efficient while saving the water environment.

Keywords—Garbage Boat, Waste Collector, Waste Ship, Internet of Things (IoT), Waste Boat

I. INTRODUCTION

In the era of Industry 4.0, technologies are increasingly advanced and developing, it can't be avoided that more and more inventions using raw materials and waste are produced. However, along with an increase in the number of citizens, accompanied by an increase in income levels, it is able to change the trend of public consumption, financial improvements, as well as urbanization and an increase in the number of industries have the impact of increasing the volume and type of waste each year (Ngoc and Schnitzer, 2009), especially inorganic waste such as plastic, or other materials that are difficult to decompose if left alone. In this case, not a few people have the habit of littering, both on roads, ditches and roadside which will then flow and empty into the sea. The sea itself is a container for direct distribution of waste or garbage from various activities carried out by humans. Thus, what happens in the sea is that there are many types of waste and garbage polluted with other chemicals (Siahainenia, 2001), this of course causes water pollution and microplastic pollution in the sea. Marine debris or marine debris is a solid type of material which is intentionally or unintentionally dumped into the sea, resulting in adverse impacts that can ultimately threaten the survival and sustainability of many marine biota

(Zulkarnaen, 2017). Trash that cannot be decomposed will have an impact on decreasing oxygen levels in the sea, this can cause death in marine habitats caused by depletion of underwater oxygen levels. This, if it does not receive serious and genuine attention, will have a negative impact on the food chain, the economy, and the health sector of the population living in coastal areas. Plastic-based waste in large volumes has an adverse effect on marine life that is in the IUCN red list category or not according to (Gall and Thompson, 2015).

Therefore, introducing Ro-boat prototype, an IoT-based non-autonomous garbage collection boat that can separate organic, metal and non-metal waste so it can reduce pollution and contamination of marine ecosystems. With an operating system using a remote control, this tool can be used easily, and can be operated by anyone. This ship feature is expected to have a positive impact in efforts to overcome and reduce pollution that occurs, especially in the aquatic environment.

II. LITERATURE REVIEW

A. Concept Idea

Ro-boat is a type of ship that generally operates in aquatic environments such as rivers, lakes and seas. Broadly speaking, Ro-boats are designed to collect and separate waste automatically according to its type so that the waste can be collected at the nearest landfill (TPS). The ship's hull is designed with a double hull hull type and the propulsion system of this ship uses a waterjet. The method of transporting waste used on this ship uses a conveyor belt with an adjustable speed. The waste sorting process is carried out by a proximity sensor with a lever that will automatically move to separate and direct the waste to enter the waste container according to its type. The Ro-boat control system is supported by a remote control as a transmitter, this control system is selected based on the user of this ship, the ship is functionally designed in an easy way to use so that anyone can operate it without problems. The dimensions of the Roboat are designed to be as minimal as possible while still paying attention to the level of functionality of this ship in terms of waste transport capacity. Therefore, the Ro-boat design concept focuses on producing technology that is