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Harish Sharma · Vivek Shrivastava ·
Kusum Kumari Bharti · Lipo Wang
Editors

Communication and Intelligent Systems

Proceedings of ICCIS 2022, Volume 1

Springer

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Preface

This book contains outstanding research papers as the proceedings of the 4th International Conference on Communication and Intelligent Systems (ICCIS 2022), which was held on December 19–20, 2022, at National Institute of Technology Delhi, India, under the technical sponsorship of the Soft Computing Research Society, India. The conference is conceived as a platform for disseminating and exchanging ideas, concepts, and results of researchers from academia and industry to develop a comprehensive understanding of the challenges of the advancements of intelligence in computational viewpoints. This book will help in strengthening congenial networking between academia and industry. This book presents novel contributions in the areas of communication and intelligent systems, and it serves as reference material for advanced research. The topics covered are: intelligent system: algorithms and applications, intelligent data analytics and computing, informatics and applications, and communication and control systems.

ICCIS 2022 received a significant number of technical contributed articles from distinguished participants from home and abroad. ICCIS 2022 received 410 research submissions. After a very stringent peer-reviewing process, only 108 high-quality papers were finally accepted for presentation and the final proceedings.

This book presents first volume of 55 research papers related to Communication and Intelligent Systems and serves as reference material for advanced research.

Kota, India — Harish Sharma
New Delhi, India — Vivek Shrivastava
Singapore — Lipo Wang
Jabalpur, India — Kusum Kumari Bharti

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Color Image Encryption Using Hybrid Three-Scroll Unified Chaotic Attractor and 6D Hyperchaotic System

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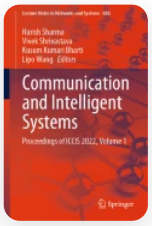

Communication and Intelligent Systems

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Subhashish Pal, Arghya Pathak, Ansuman Mahanty, Hrishikesh Mondal & Mrinal Kanti Mandal

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Abstract

This paper proposes a hybrid encryption algorithm using the three-scroll unified chaotic attractor (TSUCA) and 6D hyperchaotic systems.With the help of a 32-character key, six highly sensitive initial conditions have been generated. Out of these six initial conditions, the first three have been used in TSUCA, and all six initial conditions have been used in the 6D hyperchaotic system along with the image information for generating the chaotic sequences. The proposed algorithm involves pixel confusion and pixel shuffling to acquire a high security level. Two-level encryption using chaotic sequences generated from TUSCA and 6D hyperchaotic systems are used in the encryption algorithm. To check the efficacy of the suggested algorithm, standard security tests like key space and key sensitivity, histogram analysis, correlation analysis, NPCR, UACI, entropy, noise effect, etc., have been performed. The suggested cryptosystem has shown promising results compared to other methods, as mentioned in this paper.

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