

ieee transactions on emerging topics in computational intelligence

ieee transactions on emerging topics in computational intelligence represents a leading scholarly publication that focuses on advancing the frontiers of computational intelligence by highlighting innovative research and novel methodologies. This journal serves as a pivotal platform for disseminating groundbreaking studies in areas such as machine learning, evolutionary computation, neural networks, and fuzzy systems. Researchers, practitioners, and academics rely on this publication to stay informed about emerging trends, state-of-the-art techniques, and applications that push the boundaries of artificial intelligence and intelligent systems. With a rigorous peer-review process and a commitment to quality, the IEEE Transactions on Emerging Topics in Computational Intelligence plays a critical role in shaping the future of computational intelligence research. This article explores the scope, key topics, submission process, and impact of this prestigious journal, shedding light on why it is essential for advancing knowledge in the field.

- Overview of IEEE Transactions on Emerging Topics in Computational Intelligence
- Scope and Focus Areas
- Editorial and Peer-Review Process
- Key Research Topics and Trends
- Importance and Impact in the Computational Intelligence Field
- Submission Guidelines and Publication Process

Overview of IEEE Transactions on Emerging Topics in Computational Intelligence

The IEEE Transactions on Emerging Topics in Computational Intelligence is a flagship journal published by the IEEE Computational Intelligence Society. It aims to publish high-quality, peer-reviewed papers that highlight novel research and emerging areas within computational intelligence. The journal addresses the rapid evolution of intelligent systems and provides a forum for researchers to present innovative solutions and theoretical advancements. It covers a wide range of topics that reflect the dynamic nature of computational intelligence and its applications across various domains. Since its inception, the journal has gained recognition for its commitment to excellence and for fostering interdisciplinary research that integrates concepts from computer science, engineering, data science, and cognitive computing. It is indexed in major databases, ensuring wide accessibility and visibility within the scientific community.

Scope and Focus Areas

The scope of the IEEE Transactions on Emerging Topics in Computational Intelligence encompasses a broad spectrum of research areas that are at the forefront of intelligent computing. It seeks contributions that push beyond traditional boundaries and introduce innovative concepts, algorithms, and systems.

Core Areas Covered

This journal covers several key areas within computational intelligence, including but not limited to:

- **Machine Learning:** New paradigms, deep learning architectures, and adaptive learning methods.
- **Evolutionary Computation:** Genetic algorithms, evolutionary strategies, and hybrid metaheuristics.
- **Neural Networks:** Novel network designs, training techniques, and applications in pattern

recognition.

- **Fuzzy Systems:** Advanced fuzzy logic models, control systems, and decision-making frameworks.
- **Swarm Intelligence:** Bio-inspired algorithms and multi-agent systems.

Emerging Topics Emphasized

The journal also focuses on emerging topics that are shaping the future of computational intelligence, such as:

- Explainable AI (XAI) and interpretable models
- Quantum-inspired computational intelligence
- Neuro-symbolic computing
- Computational intelligence for big data and IoT
- Human-centric intelligent systems and ethical AI

Editorial and Peer-Review Process

The IEEE Transactions on Emerging Topics in Computational Intelligence maintains a rigorous editorial and peer-review process to ensure the publication of high-quality scientific contributions. Manuscripts submitted to the journal undergo a multi-stage evaluation involving expert reviewers and editorial board members specialized in computational intelligence.

Manuscript Evaluation

Submissions are first assessed for relevance, originality, and adherence to the journal's scope.

Suitable manuscripts are then sent for double-blind peer review, where independent experts critically evaluate the technical soundness, novelty, and clarity of the research.

Review Criteria

Reviewers focus on several key aspects, including:

- Innovativeness of the proposed approach or methodology
- Quality and rigor of experimental design and analysis
- Clarity and coherence of presentation
- Significance and impact on the field of computational intelligence

The editorial board ensures that only manuscripts meeting high standards are accepted for publication, thereby maintaining the journal's reputation and influence.

Key Research Topics and Trends

The IEEE Transactions on Emerging Topics in Computational Intelligence showcases cutting-edge research that reflects current and future trends in intelligent systems. These topics demonstrate the diversity and interdisciplinary nature of the journal's content.

Deep Learning and Neural Architectures

Innovations in deep learning techniques, including convolutional neural networks, recurrent networks, and transformers, dominate a significant portion of recent publications. These methods are applied to

complex problems such as image and speech recognition, natural language processing, and autonomous systems.

Hybrid and Multi-Modal Systems

Research integrating multiple computational intelligence techniques, such as combining fuzzy logic with neural networks or evolutionary algorithms with reinforcement learning, is a prominent theme. These hybrid approaches aim to enhance accuracy, robustness, and interpretability.

Computational Intelligence in Real-World Applications

Emerging applications covered include healthcare informatics, smart cities, robotics, cybersecurity, and financial modeling. The journal highlights how computational intelligence techniques contribute to solving practical challenges across various industries.

Importance and Impact in the Computational Intelligence Field

The IEEE Transactions on Emerging Topics in Computational Intelligence holds a vital role in advancing research and development within the computational intelligence community. Its impact is evidenced by its high citation rates, influence on academic curricula, and adoption by industry leaders.

Academic and Research Influence

Scholars utilize this journal as a key resource for state-of-the-art methodologies and emerging trends, often referencing its articles to support new hypotheses and experimental designs. The journal also fosters collaboration among interdisciplinary teams by disseminating research that bridges multiple scientific domains.

Industrial and Practical Relevance

Many articles published in the journal translate into practical solutions and technologies that drive innovation in artificial intelligence applications. Industries such as healthcare, finance, manufacturing,

and autonomous systems benefit from the insights and breakthroughs shared through this publication.

Submission Guidelines and Publication Process

Authors aiming to contribute to the IEEE Transactions on Emerging Topics in Computational Intelligence must adhere to detailed submission guidelines designed to facilitate a smooth and transparent publication process.

Manuscript Preparation

Manuscripts should be prepared following the IEEE style and formatting requirements, ensuring clarity, conciseness, and completeness. Authors must include comprehensive descriptions of their methodologies, experiments, and results to enable reproducibility and verification.

Submission and Review Timeline

The submission process is conducted through an online system that tracks the manuscript from initial submission to final decision. Typical review cycles include:

1. Initial editorial screening
2. Peer review by expert referees
3. Revision requests and author responses
4. Final acceptance or rejection

The journal encourages timely revisions and transparent communication throughout this process to maintain efficiency and quality.

Frequently Asked Questions

What is the IEEE Transactions on Emerging Topics in Computational Intelligence journal?

IEEE Transactions on Emerging Topics in Computational Intelligence is a peer-reviewed journal that publishes high-quality research articles on emerging and innovative topics in the field of computational intelligence.

What types of topics are covered in IEEE Transactions on Emerging Topics in Computational Intelligence?

The journal covers topics such as neural networks, fuzzy systems, evolutionary computation, deep learning, reinforcement learning, and other novel computational intelligence techniques and applications.

How can I submit a paper to IEEE Transactions on Emerging Topics in Computational Intelligence?

Authors can submit their manuscripts through the IEEE's online manuscript submission system after ensuring that their work aligns with the journal's scope and formatting guidelines.

Is IEEE Transactions on Emerging Topics in Computational Intelligence an open access journal?

The journal offers a hybrid open access model, allowing authors to choose open access publication by paying an article processing charge, while other articles remain subscription-based.

What is the impact factor of IEEE Transactions on Emerging Topics in

Computational Intelligence?

The impact factor varies yearly; authors should check the latest Journal Citation Reports or the IEEE Xplore website for the most current impact factor.

Who is the target audience for IEEE Transactions on Emerging Topics in Computational Intelligence?

The target audience includes researchers, practitioners, and academics interested in the latest developments and research findings in computational intelligence and its emerging topics.

Are there special issues in IEEE Transactions on Emerging Topics in Computational Intelligence?

Yes, the journal frequently publishes special issues focused on cutting-edge and timely topics within computational intelligence to highlight significant advances and research trends.

What are the review criteria for papers submitted to IEEE Transactions on Emerging Topics in Computational Intelligence?

Submissions are evaluated based on originality, technical quality, significance of the contribution, clarity, and relevance to emerging topics in computational intelligence.

How long does the review process take for IEEE Transactions on Emerging Topics in Computational Intelligence?

The review process typically takes several months, depending on the availability of reviewers and the complexity of the paper, but the journal strives to provide timely feedback to authors.

Additional Resources

1. *Advances in Computational Intelligence: Emerging Trends and Applications*

This book explores the latest developments in computational intelligence, focusing on emerging algorithms and their applications in real-world problems. It covers topics such as neural networks, fuzzy systems, and evolutionary computation, emphasizing their integration for smarter decision-making processes. The text is suitable for researchers and practitioners interested in cutting-edge computational techniques.

2. *Deep Learning for Emerging Topics in Computational Intelligence*

Focusing on the transformative impact of deep learning, this book addresses novel architectures and training methods relevant to emerging challenges in computational intelligence. It includes case studies on natural language processing, computer vision, and autonomous systems, highlighting how deep learning drives innovation. Practical examples and experimental results provide insights into current research trends.

3. *Swarm Intelligence and Its Applications in Emerging Computational Problems*

This volume provides an in-depth examination of swarm intelligence techniques, such as particle swarm optimization and ant colony optimization, applied to complex computational tasks. It showcases how collective behavior models from nature inspire algorithms that solve optimization and control problems in dynamic environments. The book offers both theoretical foundations and application-oriented perspectives.

4. *Fuzzy Logic and Its Role in Emerging Computational Intelligence Systems*

The book delves into fuzzy logic theory and its expanding role in handling uncertainty and imprecision within computational intelligence frameworks. It discusses the design of fuzzy inference systems for decision support, pattern recognition, and control applications in evolving technological domains. Readers will gain an understanding of how fuzzy methods complement other AI techniques for robust solutions.

5. *Evolutionary Computation in Emerging Intelligent Systems*

This text covers the principles and advancements in evolutionary computation, including genetic

algorithms, genetic programming, and evolutionary strategies. It emphasizes their application to emerging intelligent systems that require adaptive, flexible, and scalable problem-solving approaches. The book also explores hybrid methods combining evolutionary algorithms with other computational intelligence techniques.

6. Hybrid Approaches in Computational Intelligence: Emerging Trends and Techniques

Highlighting the synergy of combining multiple computational intelligence methods, this book presents hybrid models that leverage the strengths of neural networks, fuzzy systems, and evolutionary algorithms. It discusses frameworks for enhancing performance in complex tasks such as data mining, robotics, and bioinformatics. The content is geared towards researchers developing integrated intelligent systems.

7. Computational Intelligence in Big Data Analytics: Emerging Perspectives

This book addresses the challenges and opportunities of applying computational intelligence to big data analytics. It covers scalable algorithms and architectures designed to process and analyze massive datasets efficiently. Topics include feature selection, clustering, classification, and anomaly detection, with a focus on emerging applications in healthcare, finance, and social media.

8. Reinforcement Learning in Emerging Computational Intelligence Applications

Focusing on the role of reinforcement learning, this book explores its application in dynamic and uncertain environments typical of emerging computational intelligence problems. It presents algorithms for continuous learning and decision-making in areas such as autonomous systems, game AI, and adaptive control. The book also discusses recent advances and future research directions.

9. Explainable Computational Intelligence: Emerging Methods and Applications

This volume examines the growing need for transparency and interpretability in computational intelligence models. It explores emerging methods for explainable AI, including rule extraction, visualization techniques, and interpretable model design. The book highlights applications where understanding model decisions is critical, such as healthcare diagnostics and financial forecasting.

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ieee transactions on emerging topics in computational intelligence: Neural Network Algorithms and Their Engineering Applications Chao Huang, Hailong Huang, Yiying Zhang, 2025-01-23 Neural Network Algorithms and Their Engineering Applications presents the relevant techniques used to improve the global search ability of neural network algorithms in solving complex engineering problems with multimodal properties. The book provides readers with a complete study of how to use artificial neural networks to design a population-based metaheuristic algorithm, which in turn promotes the application of artificial neural networks in the field of engineering optimization. The authors provide a deep discussion for the potential application of machine learning methods in improving the optimization performance of the neural network algorithm, helping readers understand how to use machine learning methods to design improved versions of the algorithm. Users will find a wealth of source code that covers all applied algorithms. Code applications enhance readers' understanding of methods covered and facilitate readers' ability to apply the algorithms to their own research and development projects. - Provides a comprehensive understanding of the development of metaheuristics, helping readers grasp the principle of employing artificial neural networks to design a population-based metaheuristic algorithm - Shows readers how to overcome the challenges faced in applying neural network algorithms to complex engineering optimization problems with multimodal properties - Demonstrates how to design new variants of neural network algorithms and how to apply machine learning methods to neural network algorithms - Covers source code to help readers solve engineering optimization problems - Shows readers how to develop the offered source code to create innovative solutions to their problems

ieee transactions on emerging topics in computational intelligence: Artificial Intelligence Algorithms for Image Dehazing and Non-Uniform Illumination Enhancement Teena Sharma, Nishchal K. Verma, 2024-06-17 This book offers a detailed insight of artificial intelligence (AI) algorithms for image dehazing and non-uniform illumination enhancement. In this book, various image enhancement techniques under hazy and non-uniform illumination conditions are discussed. The book specifically provides a detail on how to approach image enhancement under different outdoor conditions using AI tools. The biggest benefit a reader would accrue is to get exposed to the various aspects one should take care of while working with digital images. The book also includes

multiple inventions which were recently introduced by the authors for image enhancement and reviews the state of the art in respective subject matters.

ieee transactions on emerging topics in computational intelligence: *Internet of Things* Qusay F. Hassan, Atta ur Rehman Khan, Sajjad A. Madani, 2017-12-15 *Internet of Things: Challenges, Advances, and Applications* provides a comprehensive introduction to IoT, related technologies, and common issues in the adoption of IoT on a large scale. It surveys recent technological advances and novel solutions for challenges in the IoT environment. Moreover, it provides detailed discussion of the utilization of IoT and its underlying technologies in critical application areas, such as smart grids, healthcare, insurance, and the automotive industry. The chapters of this book are authored by several international researchers and industry experts. This book is composed of 18 self-contained chapters that can be read, based on interest. Features: Introduces IoT, including its history, common definitions, underlying technologies, and challenges Discusses technological advances in IoT and implementation considerations Proposes novel solutions for common implementation issues Explores critical application domains, including large-scale electric power distribution networks, smart water and gas grids, healthcare and e-Health applications, and the insurance and automotive industries The book is an excellent reference for researchers and post-graduate students working in the area of IoT, or related areas. It also targets IT professionals interested in gaining deeper knowledge of IoT, its challenges, and application areas.

ieee transactions on emerging topics in computational intelligence: *Crowd Assisted Networking and Computing* Al-Sakib Khan Pathan, 2018-09-03 Crowd computing, crowdsourcing, crowd-associated network (CrAN), crowd-assisted sensing are some examples of crowd-based concepts that harness the power of people on the web or connected via web-like infrastructure to do tasks that are often difficult for individual users or computers to do alone. This creates many challenging issues like assessing reliability and correctness of crowd generated information, delivery of data and information via crowd, middleware for supporting crowdsourcing and crowd computing tasks, crowd associated networking and its security, Quality of Information (QoI) issues, etc. This book compiles the latest advances in the relevant fields.

ieee transactions on emerging topics in computational intelligence: *Smart Manufacturing Factory* Jiafu Wan, Baotong Chen, Shiyong Wang, 2023-12-28 Artificial Intelligence (AI) technologies enable manufacturing systems to sense the environment, adapt to external needs, and extract process knowledge, including business models such as intelligent production, networked collaboration, and extended service models. This book therefore focuses on the implementation of AI in customized manufacturing (CM). The main topics include edge intelligence in manufacturing, heterogeneous networks, intelligent fault diagnosis and maintenance, dynamic resource scheduling in manufacturing, and the construction mode of the smart factory. Based on the insights of CM and AI, the authors demonstrate the implementation of AI in the smart factory for CM, including architecture, information fusion, data analysis, dynamic scheduling, flexible production line construction, and smart manufacturing services. This book will provide important research content for scholars in artificial intelligence, smart manufacturing, machine learning, multi-agent systems, and industrial Internet of Things.

ieee transactions on emerging topics in computational intelligence: *Intelligent System Design* Suresh Chandra Satapathy, Vikrant Bhateja, B. Janakiramaiah, Yen-Wei Chen, 2020-08-10 This book presents a collection of high-quality, peer-reviewed research papers from the 6th International Conference on Information System Design and Intelligent Applications (INDIA 2019), held at Lendi Institute of Engineering & Technology, India, from 1 to 2 November 2019. It covers a wide range of topics in computer science and information technology, including data mining and data warehousing, high-performance computing, parallel and distributed computing, computational intelligence, soft computing, big data, cloud computing, grid computing and cognitive computing.

ieee transactions on emerging topics in computational intelligence: *Hybridization of Blockchain and Cloud Computing* M. Lawanya Shri, E. Gangadevi, K. Santhi, Chiranjil Chowdhary, 2023-10-13 Exploring many aspects of blockchain technologies and providing an

overview of the latest cutting-edge developments along with their diversified business applications, this volume addresses the challenges, emerging issues, and problems in classical centralized architecture and covers how blockchain platforms provide almost magical solutions and novel services for improving business processes. Focusing on blockchain technology-based distributed transactions for industrial use, the chapters address applications in sectors such as healthcare, pharmaceutical drug supply, finance and banking, agriculture and farming, semantic web services, etc. The book explores blockchain applications associated with security issues, cryptocurrencies, cloud computing, Internet of Things, estimating intelligence (of crows, as an example) using artificial intelligence, and more. The chapters discuss deployment, feasibility studies, and the many diverse services offered by blockchain technology

ieee transactions on emerging topics in computational intelligence: Intelligent Systems and Applications in Computer Vision Nitin Mittal, Amit Kant Pandit, Mohamed Abouhawwash, Shubham Mahajan, 2023-11-02 The book comprehensively covers a wide range of evolutionary computer vision methods and applications, feature selection and extraction for training and classification, and metaheuristic algorithms in image processing. It further discusses optimized image segmentation, its analysis, pattern recognition, and object detection. Features: Discusses machine learning-based analytics such as GAN networks, autoencoders, computational imaging, and quantum computing Covers deep learning algorithms in computer vision Showcases novel solutions such as multi-resolution analysis in imaging processing, and metaheuristic algorithms for tackling challenges associated with image processing Highlight optimization problems such as image segmentation and minimized feature design vector Presents platform and simulation tools for image processing and segmentation The book aims to get the readers familiar with the fundamentals of computational intelligence as well as the recent advancements in related technologies like smart applications of digital images, and other enabling technologies from the context of image processing and computer vision. It further covers important topics such as image watermarking, steganography, morphological processing, and optimized image segmentation. It will serve as an ideal reference text for senior undergraduate, graduate students, and academic researchers in fields including electrical engineering, electronics, communications engineering, and computer engineering.

ieee transactions on emerging topics in computational intelligence: Medical Image Computing and Computer Assisted Intervention - MICCAI 2024 Marius George Linguraru, Qi Dou, Aasa Feragen, Stamatia Giannarou, Ben Glocker, Karim Lekadir, Julia A. Schnabel, 2024-10-03 The 12-volume set LNCS 15001 - 15012 constitutes the proceedings of the 27th International Conferenc on Medical Image Computing and Computer Assisted Intervention, MICCAI 2024, which took place in Marrakesh, Morocco, during October 6-10, 2024. MICCAI accepted 857 full papers from 2781 submissions. They focus on neuroimaging; image registration; computational pathology; computer aided diagnosis, treatment response, and outcome prediction; image guided intervention; visualization; surgical planning, and surgical data science; image reconstruction; image segmentation; machine learning; etc.

ieee transactions on emerging topics in computational intelligence: Artificial Intelligence for Cognitive Modeling Pijush Dutta, Souvik Pal, Asok Kumar, Korhan Cengiz, 2023-04-19 This book is written in a clear and thorough way to cover both the traditional and modern uses of artificial intelligence and soft computing. It gives an in-depth look at mathematical models, algorithms, and real-world problems that are hard to solve in MATLAB. The book is intended to provide a broad and in-depth understanding of fuzzy logic controllers, genetic algorithms, neural networks, and hybrid techniques such as ANFIS and the GA-ANN model. Features: A detailed description of basic intelligent techniques (fuzzy logic, genetic algorithm and neural network using MATLAB) A detailed description of the hybrid intelligent technique called the adaptive fuzzy inference technique (ANFIS) Formulation of the nonlinear model like analysis of ANOVA and response surface methodology Variety of solved problems on ANOVA and RSM Case studies of above mentioned intelligent techniques on the different process control systems This book can be used as a handbook and a guide for students of all engineering disciplines, operational research areas, computer applications,

and for various professionals who work in the optimization area.

ieee transactions on emerging topics in computational intelligence: *Establishing AI-Specific Cloud Computing Infrastructure* Sharma, Avinash Kumar, Nitin, Kumar, Sumit, 2025-04-08 As artificial intelligence (AI) continues to drive innovation across industries, the need for specialized cloud computing infrastructure to support AI workloads is critical. Traditional cloud platforms often struggle to meet the high computational demands and storage requirements of AI models, especially as they grow in complexity and scale. Establishing AI-specific cloud computing infrastructure involves designing systems optimized for the needs of AI, such as powerful processing capabilities, massive data storage, and real-time processing. With advancements in hardware like graphics processing units and tensor processing units, along with sophisticated data management solutions, businesses can better harness the full potential of AI technologies. This specialized infrastructure enhances the performance and scalability of AI applications while enabling faster innovation and more efficient deployment of AI-driven solutions across sectors. Establishing AI-Specific Cloud Computing Infrastructure explores how AI has evolved as a transformative new technology, capable of delivering large incremental value to a wide range of sectors. It examines recent advances in innovation, specifically how computing power, data storage, and digitized data have led to AI-based applications for business and governance. This book covers topics such as digital technology, sustainable development, and artificial intelligence, and is a useful resource for computer engineers, business owners, academicians, data scientists, and researchers.

ieee transactions on emerging topics in computational intelligence: *Smart Edge Computing* Rajdeep Chakraborty, Anupam Ghosh, Jyotsna Kumar Mandal, Tanupriya Choudhury, Prasenjit Chatterjee, 2024-03-19 This book pioneers the synergy between state-of-the-art edge computing technologies and the power of operations research. It comprehensively explores real-world applications, demonstrating how various operations' research techniques enhance edge computing's efficiency, reliability and resource allocation. Innovative solutions for dynamic task scheduling, load balancing and data management, all tailored to the unique challenges of edge environments, are displayed. Starting with operation research methodologies with foundations, applications and research challenges in edge computing and an overview of digital education, this book continues with an exploration of applications in the health sector using IoT, intelligent payment procedures and performance measurement of edge computing, using edge computing and operation research. Smart or AI-based applications are also explored further on and the book ends with insight into ultralightweight and security protocols with solutions for IoT using blockchain.

ieee transactions on emerging topics in computational intelligence: *Distributed Energy Resources and Electric Vehicle* Aijaz Ahmad, Kushal Jagtap, Keerti Rawal, 2024-02-29 Explore the prospective developments in energy systems and transportation through an in-depth examination of Distributed Energy Resources and Electric Vehicle: Analysis and Optimisation of Network Operations . This innovative publication explores the realm of renewable energy, electric vehicles, and their influence on network operations, offering valuable perspectives for readers from diverse disciplines. This extensive publication delves into the complex interplay between distributed energy resources (DERs) and electric vehicles (EVs), as well as their incorporation into established power grids. The subject matter encompasses a diverse array of topics, encompassing the attributes and advantages of distributed energy resources (DERs) and electric vehicles (EVs), obstacles related to grid integration, efficient allocation of resources, and strategies pertaining to demand response. The book offers a comprehensive exploration of system analysis and optimisation techniques, emphasising the effective utilisation of distributed energy resources (DERs) and electric vehicles (EVs) in energy networks. It aims to equip readers with a robust comprehension of strategies to optimise the performance and potential of DERs and EVs in this context. The book focuses on pioneering research and innovative solutions that are at the forefront of enhancing network operations. The authors demonstrate the novelty and applicability of their findings through the examination of real-world case studies and the utilisation of sophisticated mathematical models. This book serves as a highly valuable resource for individuals engaged in research, engineering,

policy-making, and industry-related activities who are interested in effectively navigating the dynamic realm of energy systems and transportation. It equips them with the necessary knowledge and insights to make well-informed decisions that contribute to the attainment of a sustainable future.

ieee transactions on emerging topics in computational intelligence: *Intelligent Computing and Communication Techniques* Arvind Dagur, Karan Singh, Pawan Singh Mehra, Dhirendra Kumar Shukla, 2025-06-10 This book contains a prolific compilation of research papers presented at the International Conference on Intelligent Computing and Communication Techniques (ICICCT 2024). Some of its key features include: In-depth coverage of artificial intelligence, blockchain, and their role in enhancing smart living and security, with a focus on intelligent computing. Depiction of detailed system models and architecture to illustrate the practical applications of AI. Discussion on the role of AI and blockchain in banking, healthcare, navigation, communication, security, etc. Analysis of the challenges and opportunities presented by intelligent computing, communication techniques and blockchain in healthcare, education, banking and related industries. It is designed for academics, researchers, students, and professionals seeking to expand their knowledge and engage with current research on artificial intelligence, secure transactions, real-time monitoring, and security.

ieee transactions on emerging topics in computational intelligence: *AI-Enabled Threat Detection and Security Analysis for Industrial IoT* Hadis Karimipour, Farnaz Derakhshan, 2021-08-03 This contributed volume provides the state-of-the-art development on security and privacy for cyber-physical systems (CPS) and industrial Internet of Things (IIoT). More specifically, this book discusses the security challenges in CPS and IIoT systems as well as how Artificial Intelligence (AI) and Machine Learning (ML) can be used to address these challenges. Furthermore, this book proposes various defence strategies, including intelligent cyber-attack and anomaly detection algorithms for different IIoT applications. Each chapter corresponds to an important snapshot including an overview of the opportunities and challenges of realizing the AI in IIoT environments, issues related to data security, privacy and application of blockchain technology in the IIoT environment. This book also examines more advanced and specific topics in AI-based solutions developed for efficient anomaly detection in IIoT environments. Different AI/ML techniques including deep representation learning, Snapshot Ensemble Deep Neural Network (SEDNN), federated learning and multi-stage learning are discussed and analysed as well. Researchers and professionals working in computer security with an emphasis on the scientific foundations and engineering techniques for securing IIoT systems and their underlying computing and communicating systems will find this book useful as a reference. The content of this book will be particularly useful for advanced-level students studying computer science, computer technology, cyber security, and information systems. It also applies to advanced-level students studying electrical engineering and system engineering, who would benefit from the case studies.

ieee transactions on emerging topics in computational intelligence: *Soft Computing in Industry 5.0 for Sustainability* C Kishor Kumar Reddy, Thandiwe Sithole, Mariya Ouaisa, Özen ÖZER, Marlia M. Hanafiah, 2024-11-15 Soft computing and Industry 5.0 are two distinct concepts that, when combined, can have a significant impact on sustainability initiatives within various industries. Soft computing is a subfield of artificial intelligence (AI) that aims to address problems characterized by uncertainty, imprecision, and partial truth. It encompasses various computational techniques, such as fuzzy logic, neural networks, genetic algorithms, and machine learning, which enable machines to deal with complex and uncertain data in a more human-like manner. Soft computing techniques are particularly valuable in sustainability efforts because they can handle non-linear relationships and uncertain data that often arise in environmental and social contexts. For example, they can be used to optimize energy consumption, waste management, and resource allocation in industries by considering various factors and trade-offs. The book highlights the latest innovations in intelligent systems in classical machine learning, deep learning, Internet of Things (IoT), Industrial Internet of Things (IIoT), blockchain, knowledge representation, knowledge

management, big data, and natural language processing. (NLP). The book contains many contemporary articles from both scientists and practitioners working in many fields where soft computing, intelligent systems and the IIoT can break new ground. Intelligent systems and the Internet of Things are now essential technologies in almost every field. From agriculture to industry to healthcare, the scope of smart systems and IIoT is as wide as the horizon. Nowadays, these technologies are extensively used in developed countries, but they are still at an early stage in emerging countries. The primary market of this book is senior undergraduate students, post graduate students, practitioners, researchers, academicians, industrialists, and professionals working in areas of core computer science, electrical engineering, mechanical engineering, environmental engineering and agricultural engineering. The secondary audience of this book is individuals working in the areas of manufacturing, agriculture, remote sensing, environmental engineering, health care, smart cities, smart farming, remote sensing, supply chain management and hydrology.

ieee transactions on emerging topics in computational intelligence: Driving Modern Business Intelligence Architecture for Operational Efficiency Ishtaiwi, Abdelraouf, Al-Qerem, Ahmad, Al Khaldy, Mohammad, Alauthman, Mohammad, 2025-09-10 Driving modern business intelligence (BI) architecture is essential for organizations to enhance operational efficiency and make data-driven decisions. As businesses accumulate large amounts of data from diverse sources, traditional BI tools struggle to deliver real-time insights and agility. Modern BI architecture leverages cloud-based platforms, data lakes, AI-driven analytics, and self-service capabilities to unify data access and accelerate decision-making. This empowers stakeholders across departments with actionable intelligence and streamline operations by identifying inefficiencies, predicting trends, and automating analysis. Further research into an adaptive BI framework may assist with future business strategies. Driving Modern Business Intelligence Architecture for Operational Efficiency explores the evolving landscape of data management within BI systems, addressing organizations' critical challenges in managing, processing, and utilizing vast amounts of data for strategic decision-making. It offers insights into cutting-edge tools, methodologies, and best practices for effective data management in BI environments. This book covers topics such as data governance, predictive security, and machine learning, and is a useful resource for computer engineers, business owners, economists, academicians, researchers, and data scientists.

ieee transactions on emerging topics in computational intelligence: The Digitalization Conundrum in India Keshab Das, Bhabani Shankar Prasad Mishra, Madhabananda Das, 2021-03-01 This book examines the nature, extent and implications of rapid strides digitalization has made in India since the turn of the millennium. These have been examined not merely in the sphere of information and communication technology (ICT) but its multifarious applications spreading across almost all aspects of production, services and institutions which have profound repercussions for the transformation of the society and economy at the micro, meso and macro levels. With contributions from both ICT scholars and social scientists, this book presents diverse scenarios and unravels challenges faced in the process of technical applications, access by the users of these disruptive technologies (automation, e-commerce, big data analytics & algorithms, artificial intelligence, cloud computing, etc.) which, unlike heavy machines (embodied technology), mostly defy physical space, pace of mobility and inoperability between technologies. Chapters in this volume address challenges and possibilities in establishing and operating intricate engineering infrastructure, technical and societal constraints encountered in broad-basing digitalization across layers of educational and social skills conducive to difficult geographies. Issues dealt within this book include farming, healthcare, education, food processing, e-commerce, labour, rural community development, open source data and information democracy. The chapters also reflect upon implications on local economy and society, of the very global nature of these seamless technologies where inter-operability remains the quintessential advantage of digitalization whether promoted or spearheaded through the state, private sector or global capital. The book critiques policy inadequacies and suggests plausible policy approaches to reduce the adverse impacts of fast

digitalization and broad-base potential benefits across space and levels of socio-economic development of regions and society. This book would be of interest to scholars, practitioners, technocrats, industry analysts, policy makers and civil society agencies.

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