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Preface to Special Issue on AI-Based Future Intelligent Networks and Communications Security

Recent advancements in science focus on the study and development of algorithms that can learn from and make predictions and decisions based on data collected through intelligent devices. Big data analytics, AI, and software defined networking help to drive the management of data and usage of the exceptional computational power provided by cloud computing.

This special issue explores novel concepts and cutting-edge research and developments aimed at designing fully automated advanced digital networks. Driven by technological advances in big data, AI, and ML, such systems potentially have a wide range of applications in networking and communication security. The special issue covers analytical techniques for handling the vast amount of data generated by the Internet of Things (IoT), addressing topics ranging from architectures and platforms to security and privacy issues, applications, and challenges as well as future directions. Next-generation protocols will dynamically learn and train themselves to improve reliability, fault tolerance, security, and storage optimization in cloud. These new concepts will allow network algorithms to 'learn' and change elastically based on the information they are exposed to. This issue comprises four outstanding contributions.

Rajasekar and Rajkumar [1] propose a review of isolation attack mitigation mechanisms in RPL-based 6LoWPAN networks for the IoT. The paper highlights the rapid growth of the IoT and the increasing deployment of the 6LoWPAN communication protocol. However, as the use of 6LoWPAN grows, there is also an increased risk of security threats, including isolation attacks that can compromise the network's integrity. The routing protocol for low-power and lossy networks (RPL) is susceptible to various attacks, including black hole attacks, selective forwarding attacks, and DAO inconsistency attacks (DAO-IA). The paper aims to review the defense mechanisms proposed by researchers to mitigate RPL isolation attacks and provide a taxonomy for them. Additionally, the paper discusses unresolved issues and research challenges, providing a valuable resource for researchers and practitioners working on securing 6LoWPAN networks against isolation attacks.

Khan [2] offers a study on big data in cloud computing. This review paper addresses the challenges posed by the exponential growth of data and the emergence of two new technological terms: "big data" and "cloud computing".

It highlights the need for a large computational infrastructure to handle big data's massive volume, high velocity, and variety. Cloud computing offers a robust technology to execute complex and massive data processing and eliminates the need for expensive hardware and software. This review provides an overview of different platforms available to handle big data and critically analyzes different parameters, including their correlation with cloud computing. It also focuses on the life cycle of big data and its applications in various fields and domains. The review concludes by presenting unresolved research issues that still need to be addressed and providing directions for new researchers in the field. It is hoped that this review will serve as a useful resource for researchers and practitioners working in the field of big data and cloud computing, providing valuable insights into the current state of research and development in this area.

Shekhar *et al.* [3] explore predicting wealth scores from remote sensing satellite images and household survey data using deep learning. This paper outlines a new approach to measuring poverty, using remote sensing satellite images and machine learning techniques to estimate poverty indices. The paper presents the prediction of cluster wealth scores and the relationship between wealth scores obtained from Demographic and Health Survey (DHS) data and remote sensing satellite images of India. The approach is conducted in four phases, including the use of four regression models for feature extraction and categorizing daylight images with DHS data. The paper concludes by comparing the results of the proposed model with existing results, making it a valuable resource for researchers, policymakers, and professionals working in the fields of remote sensing, machine learning, and poverty eradication.

Taneja and Thakur [4] explore sentiment-assisted cross-domain deep knowledge transfer recommendations. This paper focuses on the challenges of cross-domain recommendation systems in enterprise environments where users may not engage with all domains. The proposed solution is a Sentiment Transfer Network (STN-CDRS) that utilizes user review data to enrich sparse recommendations across domains. This approach helps to solve the cold-start problem and bridge the learning gap. The STN-CDRS model is evaluated against baseline recommendation models and other state-of-the-art review-aided cross-domain recommendation systems, demonstrating its efficiency in terms of various measures.

We extend our gratitude and congratulations to the authors of the selected papers in this special issue for their valuable contributions in terms of quality and innovation. Additionally, we would like to express our appreciation to the reviewers for their significant contributions to the selection and improvement process of the publications. Our aim is that this special issue will inspire researchers in both academia and industry to conduct further research in this challenging field. We are also grateful to Prof. Michał Kleiber and Prof. Tadeusz Burczyński,

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