

Editorial

In the ever-evolving landscape of scientific inquiry, this issue brings together a diverse collection of research papers spanning various domains of technology and science. Each paper contributes valuable insights and innovative approaches to address contemporary challenges. This editorial provides a brief overview of 16 accepted papers, highlighting its key contributions and implications.

The first paper explores the escalating energy consumption in cloud data centers, a consequence of the increasing number of servers. Tackling the problem through meta-heuristic and heuristic algorithms, the authors propose an approach using Genetic Algorithm (GA) and First Fit Decreasing (FFD) for workload placement and power consumption prediction in data centers [1]. The study demonstrates the efficiency of the proposed algorithms, particularly the superiority of GA compared to Ant Colony Optimization (ACO) and Simulated Annealing (SA).

Moving to the realm of nanotechnology, the second paper delves into the characterization of Co-Axial Cylindrical Carbon Nanotube Field Effect Transistor (CNTFET). Highlighting the advantages of CNTFET over traditional Si-MOSFET, the research investigates the impact of gate-insulator thickness on its performance, providing valuable insights for optimizing its current carrying capacity [2].

Shifting gears to robotics, the third paper introduces an open-source anthropomorphic robotic hand designed for telepresence robots. Utilizing a four-bar linkage mechanism to reduce the number of actuators while maintaining human-like movement, the authors present a cost-effective solution with applications in various fields [3]. The experimental results demonstrate the hand's capability to perform human-like movements and grasp various objects.

The fourth paper addresses the critical issue of droughts, focusing on the Marathwada region. Through a comprehensive analysis of rainfall data spanning nearly four decades, the study identifies negative trends in annual rainfall, particularly in the monsoon season. The findings lay the groundwork for advanced computation techniques to predict and mitigate droughts [4].

Shifting to the domain of error-correcting codes, the fifth paper presents a new decoder for Reed Solomon and BCH codes using a novel syndromes block. The proposed algorithm aims to reduce the number of iterations compared to existing blocks, demonstrating its efficacy through hardware description language implementation and simulation [5].

The sixth paper explores the realm of robotics control algorithms, introducing Optimal Control Allocation (OCA) and Nonlinear Model Predictive Control (NMPC) for a rover robotics system with mecanum wheels and dual arms. The study showcases the efficiency of these algorithms in addressing wheel and joint torque saturation issues while manipulating a heavy payload [6].

The seventh paper introduces an innovative approach to edge detection-based image steganography. The authors propose hybridizing edge detectors dynamically based on embedding demands, using logical AND, OR, or OR with dilation operations. The results demonstrate improved embedding capacity and security against attacks compared to existing methods [7].

In the eighth paper, the focus shifts to the robust H^∞ control of nonlinear systems subject to cyber-attacks. The authors present a polytopic modeling approach and a robust controller design

method, demonstrating its efficacy in ensuring stability and security for a quadrotor/UAV subject to actuator attacks [8].

The ninth paper introduces an ensemble of voting-based deep learning models with regularization functions for sleep stage classification. Leveraging recurrent neural network (RNN), long short-term memory (LSTM), and gated recurrent unit (GRU) models, the study achieves impressive accuracy in sleep stage classification [9].

Moving to the field of subsurface utility engineering (SUE), the tenth paper proposes an integrated GIS-SUE map cost estimation system prototype. By utilizing GIS-compatible digital spatial maps, the research aims to enhance the efficiency of utility mapping and cost estimation, providing a valuable tool for managing and maintaining utilities [10].

The eleventh paper explores the realm of olfactory acquisition through the conception and simulation of an electronic nose prototype. The study focuses on designing an efficient gas chamber for gas sensors, enhancing the overall performance of the electronic nose in measuring gas quality [11].

The twelfth paper addresses the pressing need for strengthening cybersecurity management in public organizations. The research develops a model to identify the cybersecurity management capacity of public organizations, providing a process for assessment and categorization based on the level of cybersecurity capacity [12].

The thirteenth paper contributes to the field of power system optimization, comparing the performance of particle swarm optimization (PSO) and firefly algorithm (FA) in the optimal allocation of a static synchronous compensator (STATCOM). The study showcases the benefits of FA over PSO in reducing voltage deviation and power losses [13].

In the realm of agricultural technology, the fourteenth paper introduces a novel deep learning method for the detection of Northern Leaf Blight and Gray Leaf Spot in corn. Leveraging YOLOv3 with additional enhancements, the research presents a valuable tool for early disease detection in corn crops [14].

The fifteenth paper introduces an active simulation of grounded parallel-type immittance functions employing voltage differencing buffered amplifiers (VDBAs) and all grounded passive components. The proposed circuit demonstrates the feasibility of simulating parallel-type impedances with only two VDBAs and two grounded passive components [15].

Finally, the sixteenth paper addresses the urgent need for effective models in teaching mathematics to gifted students. The research develops a comprehensive model based on various teaching approaches, demonstrating its effectiveness in improving the performance of gifted students [16].

In conclusion, this compilation of research papers reflects the richness and diversity of contemporary scientific endeavors. Each contribution brings forth innovative solutions, insights, and methodologies, contributing to the collective pursuit of knowledge and advancement in their respective fields.

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