Editorial

M. N. Hoda¹

Published online: 1 October 2021

© Bharati Vidyapeeth's Institute of Computer Applications and Management 2021

Warm greetings to all our readers!!! We hope this year brings relief and progress to humanity. BJIT remains committed to delivering on its challenge of consistently showcasing and disseminating novel researches pertaining to computing applications and capable of altering the quality of human life. It is a matter of great privilege for me to unveil before you the thirty seventh issue i.e. Volume 13 Number 05 of the “International Journal of Information Technology” [An official Journal of Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi] with acronym BJIT. From this volume onwards we have increased our frequency to six issues an year. The issue is live on the Springer content platform SpringerLink and available to the prospective readers through Springer CS package globally.

Throughout the world, nations have started recognizing that Information Technology (IT) is now acting as a catalyst in speeding up the economic activities in efficient governance, citizens' empowerment, sustainable development and in improving the quality of human life. Recent advancements in IT have touched almost every conceivable area of human life. Its degree of pervasiveness, in day to day life, is rapidly increasing, every new day. On the backdrop of this, BJIT has accepted the challenge to consistently showcase, disseminate and institutionalize the rapidly changing huge knowledgebase globally, with authenticity and accuracy, having special focus on the new researches pertaining to IT applications for improving the quality of day to day life.

Volume 13 Number 05 presents a compilation of 48 papers, chosen out of over 400 manuscripts, that span a broad variety of topics from various emerging areas of Information Technology and Computer Science, especially addressing current research problems related to Complex Networks, Semantic Information, information retrieval, traffic light management system, workload migration, Cloud Services and movie recommendation system; to name a few.

After almost over an year, our world still continues to battle the COVID. Data visualization plays an important role in the communication of complex data between expert and non-expert audiences. The first manuscript in this issue **“Designing with biodiversity data: connections among design, materials, and technology”**, Guobin Xia et al. evaluates a strategy for design of a series of interactive data installations. The second manuscript **“Detecting community structures using Modified Fast Louvain Method in complex networks”**, Laxmi Chaudhary et al. propositions a design to deal with the issue of community detection which can efficiently reveal communities in a network. Machine Learning has become an important tool for academic and related administrative challenges. The next manuscript **“Stacking and voting ensemble methods fusion to evaluate instructor performance in higher education”**, Ravinder Ahuja et al. outlines a hybrid stacking and voting ensemble based model to evaluate faculty performance. The manuscript **“An efficient feature representation strategy for offline computer synthesized font characters using multivariate filter based feature selection technique”**, Raghunath Dey et al. implements an effective and reliable technique for the offline identification of Latin font characters produced by computers. The manuscript **“Query reformulation approach using domain specific ontology for semantic information**

✉ M. N. Hoda
bjit@bvicam.ac.in

¹ Bharathi Vidyapeeth's Institute of Computer Applications and Management, New Delhi, India

retrieval”, Navjot Kaur et al. proposes a string ontology in the music domain from scratch. The next manuscript **“Novel low quantum cost reversible logic based full adders for DSP applications”**, M. C. Parameshwara et al. intends the design and comparison of state-of-the-art 1-bit FA architectures using standard reversible logic gates. Stemmer development is important to developing efficient information retrieval (IR) systems. The manuscript **“Improving stemming for Assamese information retrieval”**, Arjun Gogoi et al. designs a novel Assamese stemmer. The next manuscript **“A framework for dynamic smart traffic light management system”**, Awad Alharbi et al. advises a cost-effective framework of smart traffic lights (STL) to dynamically control and manage Traffic Lights. The manuscript **“An analytical framework for centroid-based localization in wireless sensor networks”**, Ash Mohammad Abbas addresses the mathematical characteristics of centroid based localization in a wireless sensor network. Vision based technologies are playing an important role in revolutionizing the biomedical domain. The manuscript **“Automated skull damage detection from assembled skull model using computer vision and machine learning”**, Amol Mangrulkar et al. captures the details of an automatic skull damage detection approach. The manuscript **“An open source and practical approach to X2X linux workload migration”**, Sanjeet Kumar et al. suggests a new proof of concept for X2X linux workload migration. The manuscript **“Performance evaluation of encryption algorithm using fruit fly optimization improved hybridized seeker and PVD algorithm”**, R. Roselinkiruba et al. delineates a novel data encryption algorithm. Data mining is important to dig through huge volumes of data to explore hidden patterns and rules. The manuscript **“Single document text summarization technique using optimal combination of cuckoo search algorithm, sentence scoring and sentiment score”**, Shrabanti Mandal et al. propagates a method for single document extractive summarization. Modern processors offer fast and precise execution of pipeline instruction sets. The manuscript **“Improving branch prediction by combining perceptron with learning vector quantization neural network in embedded processor”**, Sweety et al. captures a novel, hybrid perceptron branch predictor. The manuscript **“Sobel operator enhancement based on eight-directional convolution and entropy”**, Fei Hao et al. offers an improved Sobel operator based on eight-directional convolution and the reciprocal of image entropy. The manuscript **“Recency augmented hybrid collaborative movie recommendation system”**, R. Sujithra Alias Kanmani et al. details a hybrid movie recommendation system. The manuscript **“A novel hybrid compressive encryption cryptosystem based on block quarter compression via DCT and**

fractional Fourier transform with chaos”, Bharti Ahuja et al. presents an efficient, compression encryption scheme. Air quality monitoring systems systematically monitor the air pollutant levels. The manuscript **“Air quality monitoring for Smart eHealth system using firefly optimization and support vector machine”**, Pankaj Rahi et al. details a smart system of air quality monitoring that help in preventing and controlling airborne allergies and reducing the burden of disease and the cost of treatment. Challenges of manual sleep disorder identification have fuelled the demand of automated sleep insomnia identification systems. The manuscript **“Sleep insomnia identification model using sleep quality parameters”**, Sagar Santaji et al. develops a sleep stage classification model. The manuscript **“Survey on SVM and their application in image classification”**, Mayank Arya Chandra et al. evaluates some important techniques for image classification.

The manuscript, **“Robot and virtual reality-based intervention in autism: a comprehensive review”**, Fadi Abu-Amara et al. reviews and analyzes the findings in using robot-based and virtual reality-based intervention to support the therapy of improving the social, communication, emotional, and academic deficits of children with autism. Modeling through graphs is important mechanism for efficient problem solving. The manuscript, **“K-way spectral graph partitioning for load balancing in parallel computing”**, S. V. Patil et al. investigates the use of K-way spectral partitioning as a load balancing mechanism in parallel computing. The manuscript, **“Chaotic deep neural network based physical layer key generation for massive MIMO”**, C. Ismayil Siyad et al. details a novel deep learning-based physical layer encryption key generation using a chaotic neural network modelled using Chua’s chaotic dynamics. The manuscript, **“Optimization of complex nonlinear systems using genetic algorithm”**, Chhavi Mangla et al. evaluates a novel genetic algorithm based technique to solve both single and multi-objective optimization problems. The next manuscript, **“Video summarization and captioning using dynamic mode decomposition for surveillance”**, Rakesh Radarapu et al. empirically analyzes tools for motion detection and video/image captioning for very long videos. The manuscript, **“CNFET-based digitally controlled impedance multiplier”**, Shailendra K. Tripathi et al. collates a novel, carbon nanotube-FET based impedance multiplier. Airport projects are big both in scale and cost, hence they suffer from a number of challenges. The manuscript, **“Project execution obstacles: a case of King Abdulaziz Airport in Saudi Arabia”**, Abdullah Al Hudhaif et al. investigates the possible causes of airport project delays in the Kingdom of Saudi Arabia. The manuscript, **“Energy efficient emergency rescue scheme in wireless sensor**

networks”, Vinay Rishiwal et al. offers an effective energy efficient emergency energy rescue scheme. The manuscript, **“Realization of convolution layer using system verilog for achieving parallelism and improvement in performance parameters”**, R.K. Amrutha et al. details a data flow for all the three dominant parallelism styles with a single architecture of convolution layer using System Verilog. The manuscript, **“IoT application modules placement in heterogeneous fog–cloud infrastructure”**, Upma Arora et al. deploys an efficient Heterogeneous Shortest Module First (HSMF) Algorithm for placement of the modules of an application in the heterogeneous fog–cloud computing environment. The next manuscript, **“Crop yield prediction: two-tiered machine learning model approach”**, Sushila Shidnal et al. builds a model to classify nutrient deficiency of paddy crop. The manuscript, **“Handwritten Marathi numeral recognition using stacked ensemble neural network”**, Deepak T. Mane et al. a stacked ensemble meta-learning approach is proposed for Marathi handwritten numeral recognition. The manuscript, **“Design and implementation of an internet of things based low-cost smart weather prediction system”**, Sk. Fahmida Islam et al. identifies a novel IoT-based low-cost smart weather prediction system using an artificial neural network. Our unhealthy and stressful lifestyles has led to an increase in the number of cardiovascular patients each year. The manuscript, **“Cardiovascular risk assessment using data mining inferencing and feature engineering techniques”**, Aanchal Sahu et al. presents a technical analysis of various machine learning models for precise classification of cardiovascular risk. The manuscript, **“An intelligent handoff optimization algorithm for network selection in heterogeneous networks”**, Pooja Dhand et al. empirically details a handoff optimization algorithm for network selection in heterogeneous networks. Effective placement of neural networks has helped us overcome many problems. The manuscript, **“Timed neural network using object-based model of neurons for shortest path problem”**, Ramadurai Krishnan et al. emulates and proposes a cooperative neural network where every neuron is a minimal computational processing routine. The next manuscript, **“Anomaly detection using ensemble random forest in wireless sensor network”**, Priyadurai Biswas et al. simulates the design of an anomaly detection process using ensemble random forest (ERF) in wireless sensor networks. Early malaria detection is helpful in controlling fatality. The manuscript, **“A novel computation method for detection of Malaria in RBC using Photonic biosensor”**, B. M. Hemanth Kumar simulates a biosensor based technique for malaria detection. The next manuscript, **“Numerical analysis and implementation of artificial neural network algorithm for nonlinear**

function”, Pathamuthu Suresh Kumar et al. proposes a mathematical implementation of an algorithm for known values of independent and dependent variables, with and without bias. Sentiment Analysis is an important technique to improve the content of the related service. The manuscript, **“Sentiment analysis of Marathi news using LSTM”**, Manisha Satish Divate elaborates a sentiment analysis technique to filter negative news. The manuscript, **“Employing stacked ensemble approach for time series forecasting”**, Nonita Sharma et al. proposes a novel stack-based multi-level ensemble model to forecast the future incidences of conjunctivitis disease. With increasing number of cloud users maintaining data security is a prime concern. The manuscript, **“A data security and integrity framework using third-party cloud auditing”**, B. Mishachandar et al. offers an efficient cloud storage system with security restrictions. The next manuscript, **“ZeroAccess botnet investigation and analysis”**, Ramesh Singh Rawat outlays a ZeroAccess malware binary to investigate the features and functionalities of the bot. In the present world robotics has emerged as an important field. The manuscript, **“Motor velocity based multi-objective genetic algorithm controlled navigation method for two-wheeled pioneer P3-DX robot in V-REP scenario”**, Vikas Singh Panwar et al. develops a right and left motor velocity based multi-objective genetic algorithm controlled navigation method for Two-Wheeled Pioneer P3-DX Robot (TWPR). The manuscript, **“Tackling control channel saturation for load balancing in multi-channel mobile ad hoc networks”**, Rohit Kumar et al. proposes Parallel Rendezvous Multi-Channel MAC (PRMMAC) protocol based on the concept of multi-channel communications. Tree Adjoining Grammars (TAGs) are very useful psycholinguistic formalisms for syntax and dependency analysis. The manuscript, **“Exploring a genotype based formalisation for tree adjoining grammar derivations”**, Vijay Krishna Menon et al. extends the definition of the containing formalisms on which a genetic algorithm can be deployed in order to find ambiguous derivation structures for longer sentences. The manuscript, **“Internet-of-things and mobile application based hybrid model for controlling energy system”**, Manoj A. Patil et al. details an innovative hybrid method for automation system to reduce the wastage of power. The last manuscript, **“Generating optimal solutions for the routing space and spectrum allocation problem in space division multiplexing enabled elastic optical networks”**, Sridhar Iyer et al. proposes the design of an optimal solution for the routing and spectrum allocation problem in elastic optical networks.

I am sure the contributions in this issue, which is an amalgamation of novel trends and technologies to improve our life and sustainability in the present environment, will

not only enrich our reader's knowledgebase but will also motivate many of the potential researchers to take up these challenging application areas and contribute effectively for the overall prosperity of the mankind.

As a matter of policy, all the manuscripts received and considered for the Journal, are double blind peer reviewed by at-least two independent referees. Our panel of expert referees posses a sound academic background and have a rich publication record in various prestigious journals representing Universities, Research Laboratories and other Institutions of repute, globally. Finalizing the constitution of the panel of referees, for double blind peer review(s) of the considered manuscripts, was a painstaking process, but it helped us to ensure that only the best, interesting and novel of the considered manuscripts are showcased and that too after undergoing multiple cycles of review, as required.

I wish to express my sincere gratitude to the entire editorial board, members of the resident editorial team and our panel of experts in steering the considered manuscripts through multiple cycles of review and bringing out the best from the contributing authors. I thank my esteemed authors for having shown confidence in BJIT and considering it a platform to showcase and share their original research

work. I would also wish to thank the authors whose papers could not have been published in this issue of the Journal, probably because of the minor shortcomings. However, I would like to encourage them to actively contribute for the forthcoming issues.

I will fail in my duty, if I do not thank the members of the team from the Springer, particularly Ms. Suvira Srivastav, Mr. Madan Ellappan, Ms. Jeyapradha Saravanan and Ms. Nidhi Chandok for their constant support in realizing the issue and presenting it before you.

The undertaken Quality Assurance Process involved a series of well defined activities that, I trust, went a long way in ensuring the quality of the publication. Still, there is always a scope for improvement, and so, I request the contributors and readers to kindly mail me their criticism, suggestions and feedback at bjit@bvicam.ac.in and help in further enhancing the quality of forthcoming issues.

M. N. Hoda

Editor-in-Chief

International Journal of Information Technology (BJIT)