Editorial

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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 fifth issue i.e. Volume 13 Number 03 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 03 presents a compilation of forty six 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 Fog Computing, Intrusion detection system, power optimization, Teledental Encryption, Text Steganography, Cloud Services and Test Case Prioritization; to name a few.

After almost over an year, our world still continues to battle the COVID. Technology is playing a major role in easing human life in the new norm where personal interaction has taken a backseat. The first manuscript in this issue “Advantages of using fog in IoT applications”, Adnan A. Abi Sen et al. evaluates the application of fog applications in simplifying the applications of the IoT. Low-cost and improved performance has always been desirable for systems of all configurations. The second manuscript “Computation and Communication efficient secure group key exchange protocol for low configuration systems”, Arjun Singh Rawat et al. propositions design specifically to provide computation and communication efficient algorithms for low configuration systems without violating the security. As the number of IoT system devices (called things) is growing massively, there is a shift needed from the traditional LTE network to these low power networks. The next manuscript “Critical power analysis for control path of a CAT-M based edge devices”, Harshita Bhilwaria et al. outlines power measurements issues related to factors like Power Saving Mode (PSM), extended Discontinuous Reception Mode (eDRX), Uplink Transmission Power, Channel Repetition, Bandwidth and Sub-carrier Spacing. MANETs have attracted tremendous popularity in the present times. The manuscript “Enhanced route optimization technique and design of threshold-T for malicious node detection in ad hoc networks”, Shrikant V. Sonekar

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et al. implements a design for malicious node detection through threshold-T. Attaining best network quality as per user requirement is an important challenge for Wireless Sensor Networks. The manuscript “Multi-QoS constraint multipath routing in cluster-based wireless sensor network”, Jayashree Agarkhed et al. proposes an optimal cluster head selection method that selects a node as a cluster head on basis of minimal end-to-end delay and congestion index. The next manuscript “Intrusion detection system for data warehouse with second level authentication”, Amar Arora et al. intends an automatic second level authentication within the intrusion detection system. Dynamic behavior of web services is critical to determine their performance at different times. The manuscript “Simulated dataset collection method of dynamic quality of services (QoS) metrics”, Muhammad Hasnain et al. designs a novel framework for aimed to collect dynamic web services metrics data of five web services randomly selected from dataset. The next manuscript “Markov-chain based optimization algorithm for efficient routing in wireless sensor networks”, D. Deepakraj et al. advises a Markov-chain based model to identify the adjacent nodes in a wireless sensor network with improved energy efficiency. The manuscript “Shirokekha based character segmentation for medieval handwritten Devnagari manuscript”, Nikita Mehta et al. addresses the character segmentation issue for medieval handwritten Devnagari manuscripts. Cloud computing enables resources as a utility over the Internet. The manuscript “A tree based mechanism for the load balancing of virtual machines in cloud environments”, Usha Kirana Sonangeri Pushpavati et al. presents a novel paired tree algorithm to improve the performance of makespan and migration components of the cloud. The manuscript “A novel communication framework between MANET and WSN in IoT based smart environment”, Bata K. Tripathy et al. suggests an efficient and secure communication framework for interconnecting MANET and wireless sensor network devices. The manuscript “Enhanced-AES Encryption Mechanism with S-Box Splitting for Wireless Sensor Networks”, Meeta Gupta et al. delineates an enhanced-AES implementation in the heterogeneous and hierarchical multicore sensor network. Novel technological tools have made dynamic alterations in the way we interact and learn in this environment. The manuscript “Impact of Digital Technology on Saudi Students”, Abdulellah Alaboudi et al. propagates the alterations this technology has brought about in the academia. Due to the current pandemic, telemedicine has gained tremendous importance. The manuscript “Pivotal “New Normal” Telemedicine: secured psychiatric homeopathy medicine transmission in Post-COVID”, Joydeep Dey captures homeopathy telemedicine as a pivotal way to cure patients remotely. The manuscript “GBoost: A novel

Grading-AdaBoost ensemble approach for automatic identification of erythemato-squamous disease”, Sourabh Shastri et al. offers an efficient GBoost (GB) ensemble framework based on grading approach with AdaBoost scheme for analysis and prediction of erythemato-squamous disease (ESD). The manuscript “Safeguarding railway communication signals from radiated intentional EMI from a train”, Shilpa Biju et al. details a scheme to reduce the effect of low-power jammers that operate in radio frequency to control station-to-train communications. The manuscript “A novel hybrid ultra-wideband radio sensor for primitive stage detection of breast cancer”, Taruna Sharma et al. presents a hybrid antenna design highly suitable for wearable and On-body communication. The manuscript “A study on the machine learning techniques for automated plant species identification: current trends and challenges”, A.M. Bojamma et al. details varied computer vision methodologies for taxonomical identification of plants. E-Commerce has become a popular choice among working population of towns and cities to purchase at the click of a button. The manuscript “A fuzzy-based expert system to analyse purchase behaviour under uncertain environment”, Doan Van Thang et al. develops a Mamdani based Fuzzy inference model to explore the behaviour of customers during purchase of an E-commerce product under an uncertain environment. The manuscript “Switching and frequency response of ITO-gated GaAs OPFET models for VLC applications”, Jaya V. Gaitonde et al. suggests switching and frequency responses of GaAs OPFET models (buried-gate front-illuminated, and generalized, models) with Indium-Tin-Oxide (ITO) gate. Flipped voltage follower (FVF) is a basic unit used as a fundamental component in almost every field. The manuscript, “Basic low-voltage high gain amplifier block having multiple-inputs designed using differential FVF”, Bhawna Aggarwal et al. evaluates a differential flipped voltage follower (DFVF) based multiple-input transconductance amplifier design. Modeling student learning behavior is crucial to assess their performance. The manuscript, “Students’ knowledge assessment using the ensemble methods”, Maksud Ahamad et al. investigates the ensemble classifiers with various machine learning algorithms on the students’ knowledge dataset to predict the level of knowledge acquired by the students. The manuscript, “An optimal strategy to countermeasure the impersonation attack in wireless mesh network”, Regan Rajendran et al. details a novel Unique Secret Code (USC) to avoid impersonation attack. The manuscript, “A forecasting method with efficient selection of variables in multivariate data sets”, Pinki Sagar et al. evaluates a novel mechanism to reduce the cost of data maintenance, reduce the execution time and improve the prediction accuracy rate in multivariate data sets. Useful real-life images are meant for

computer vision applications but they may appear in complex forms with varied backgrounds. The next manuscript, “Evaluating shallow capsule networks on complex images”, Patrick Kwabena Mensah et al. proposes a shallow CapsNet based on dynamic routing with a custom squashing function and normalizer. The manuscript, “CSForest: an approach for imbalanced family classification of android malicious applications”, Meghana Dhalaria et al. collates a novel CSForest approach to handle the imbalanced family classification problem of malicious applications. Varied efforts at efficient video steganography have been made in the past. The manuscript, “An efficient DCT-SBPM based video steganography in compressed domain”, Rachna Patel et al. introduces an efficient robust video steganography in compressed domain model presented based on discrete cosine transform (DCT) encoded with H.264 codec. The manuscript, “DCPM: an effective and robust approach for diabetes classification and prediction”, Madhu Kumari et al. offers an effective accurate and robust Diabetes Classification and Prediction Model (DCPM) on a dataset that suffers from the class imbalance problem and contains outliers and missing values. The manuscript, “Real power loss reduction by percheron optimization algorithm”, Lenin Kanagasabai et al. details a Percheron optimization algorithm (POA) design for voltage stability enhancement and power loss reduction. The manuscript, “Performance evaluation of RSUs deployment at dense intersections”, Nidhi et al. deploys an efficient number and locations of Roadside Units (RSUs) in a realistic real time urban area network. The next manuscript, “A predictive model to estimate effort in a sprint using machine learning techniques”, Melvina Autar Ramessur et al. builds a model to estimate and predict effort in a sprint using machine learning techniques while considering various factors that affect a sprint. The manuscript, “Securing textual and image data on cloud using searchable encryption”, B. Sushmitha Baliga et al. proposes a similarity search design over large scale textual and image data using searchable encryption with feature-based and efficient indexing mechanism. The manuscript, “Peak power reduction in multicarrier systems using Goppa codes”, Sharmila Sengupta et al. identifies a novel coded OFDM scheme using Goppa codes which shows a significant improvement on reducing the peak power of transmitted signals compared to the uncoded signals along with error correction and detection. Efficient mechanisms of educational evaluation helps improve the teaching–learning process. The manuscript, “A systematic analysis of difficulty level of the question paper using student’s marks: a case study”, Ravi Lourdusamy et al. presents a technical method called Question Paper’s Difficulty Level (QPD L) that helps to identify the difficulty level of each question in the question paper. The manuscript,

“Implementation and comparison of bi-modal dynamic branch prediction with static branch prediction schemes”, Sweety Nain et al. empirically details a significant predictor for the prediction of the conditional branch instruction. Better and more efficient algorithms are always desirable to produce faster computing operations. The manuscript, “Efficient transitive operations using binary indexed trees”, Kartikey Tewari et al. emulates and proposes a novel data structure and algorithm to build, update and perform range query operations of transitive functions. The next manuscript, “A combined three and five inputs majority gate-based high performance coplanar full adder in quantum-dot cellular automata”, Fahimeh Danehdaran et al. simulates a combined majority gate towards the realization of a one-bit full-adder gate. Deep neural networks are playing a major role in revolutionizing artificial intelligence applications. The manuscript, “An efficient stochastic computing based deep neural network accelerator with optimized activation functions”, Sunny Bodiwala attempts to evaluate Stochastic Computing as a novel computing paradigm to provide significantly low hardware footprint with high scalability. The next manuscript, “American Sign Language recognition using Support Vector Machine and Convolutional Neural Network”, Vanita Jain et al. proposes the recognition of American Sign Language by using Support Vector Machine (SVM) and Convolutional Neural Network (CNN). Braille code aids the visually impaired to read with their fingers. The manuscript, “Digitized Braille cell: a novel solution for visually impaired”, S. Gayathri et al. elaborates a new and improvised design for Braille Cell using the Arduino UNO and electromagnetic relays as tactile device. The manuscript, “Mutual authentication protocol for low cost passive tag in RFID system”, Atul Kumar et al. proposes a novel ultra-lightweight authentication approach for a passive tag rough XOR and rotate operations. The modeling aspect of the computing with words paradigm is also a research challenge. The manuscript, “Effect of Linguistic Hedges on General Type-2 Fuzzy Representation of Linear Adjectives”, Bushra Siddique et al. offers the computations for fuzzy modeling of phrases consisting of linear adjectives and linguistic hedges. The next manuscript, “Arabic sign language recognition using Ada-Boosting based on a leap motion controller”, Basma Hisham outlays an Arabic Sign Language (ArSL) recognition system that uses a Leap Motion Controller and Latte Panda. In the present world online news has become a significant mechanism of immediate news dispersal. The manuscript, “Identifying click baits using various machine learning and deep learning techniques”, Sohom Ghosh et al. develops a system capable of predicting click bait social media posts (tweets) relating to new articles. The manuscript, “Identification of spectrum holes using energy detector based

spectrum sensing”, Neha Chaudhary et al. lays an efficient transmitter and receiver section for efficient spectrum sensing in cognitive radio environment. The last manuscript, “Monitoring social distancing through human detection for preventing/reducing COVID spread”, Mohd. Aquib Ansari et al. proposes an algorithm using object detection method for social distance monitoring.

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, Ms. Deepika Sureshkumar 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.

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