

## Guest Editorial Preface

# Special Issue on Recent Trends and Developments in Artificial Intelligence and its Applications

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Since the invention of computers or machines, their capability to perform various tasks went on growing exponentially. Humans have developed the power of computer systems in terms of their diverse working domains, their increasing speed, and reducing size with respect to time. A branch of Computer Science named Artificial Intelligence pursues creating the computers or machines as intelligent as human beings.

According to the father of Artificial Intelligence, John McCarthy, it is “The science and engineering of making intelligent machines, especially intelligent computer programs.” Artificial Intelligence is a way of making a computer, a computer-controlled robot, or a software think intelligently, in the similar manner the intelligent humans think. AI is accomplished by studying how human brain thinks, and how humans learn, decide, and work while trying to solve a problem, and then using the outcomes of this study as a basis of developing intelligent software and systems. While exploiting the power of the computer systems, the curiosity of human, lead him to wonder, “Can a machine think and behave like humans do?” Thus, the development of AI started with the intention of creating similar intelligence in machines that we find and regard high in humans.

Artificial intelligence is a science and technology based on disciplines such as computer science, biology, psychology, linguistics, mathematics, and engineering. A major thrust of AI is in the development of computer functions associated with human intelligence, such as reasoning, learning, and problem solving. More and more projects related to artificial intelligence models and mechanisms have been introduced so far, still the field needs to be enhanced with advancements and logistics to attain the maturation in this aspect.

The four papers in this special issue cover a range of aspects of artificial intelligence to solve many of the issues from networking, Bio-diesel blending, Medical Imaging, etc. All the desired topics are greatly obliged with the presence of machine learning and animal-inspired algorithms. Each of these revised and extended papers has undergone full double-blind peer review, prior to being selected for this special issue.

*T-Whale: Trust and Whale optimization model for secure routing in mobile Ad-hoc network* by Ch. Ram Mohan and Dr. A. Venugopal Reddy concerns the emerging technology, mobile nodes is Mobile Ad hoc Network (MANET) that often suffers from the unsecure routing issues. Hence, they have focussed on utilizing the Whale optimization algorithm (WOA), which is one of the artificial intelligence algorithms that helped in selecting the optimal secured routing path in MANET. The model

has utilized the trust factor and the distance between the nodes to compute the fitness of routing. They have also analysed the performance of proposed work with respect to various performance measures.

Yarrapragada K.S.S Rao and Dr. Bala Krishna. B addresses the issue regarding the exploitation of conventional fuel diesel. To attain this, he has introduced a Tamanu oil-diesel oil blend in A *Comprehensive Analysis on Biodiesel Blend Model*. In this work, a new neural model is proposed, which is trained by renowned firefly algorithm, termed as FF-NM. In addition, different compression ratios such as 15, 16, 17, 17.5 and blend ratios like 5:95, 6:94, 7:93, 8:92, and 9:91 and 10:90 is exploited. The analytical results prove the estimation error minimization.

In *BEASF-based Image Enhancement for Caries Detection using Multidimensional Projection and Neural Network*, Shashikant Patil, Vaishali Kulkarni, and Archana Bhise introduces a new cavity diagnosis approach with three phases: (i) Pre-processing (ii) Feature Extraction (iii) Classification. a new Bi-Histogram Equalization with Adaptive Sigmoid Functions (BEASF) is introduced in the first phase to enhance the image quality followed by other enhancements models such as grey thresholding as well as active contour. Subsequently, the features are extracted by Multilinear Principal Component Analysis (MPCA). Furthermore, the classification is performed via Neural Network (NN) classifier.

Puri Vishal and Dr. A. Ramesh Babu in *Deployment of Context-Aware Sensor in Wireless Sensor Network based on the variants of Genetic Algorithm*, makes an analysis of various GA variations in achieving the objective. The GA variations are as follows: Self-Adaptive Genetic Algorithm (SAGA), Deterministic- Adaptive Genetic Algorithm (DAGA), Individual- Adaptive Genetic Algorithm (IAGA). Finally, they have compared the methods over others with respect to connectivity and coverage performance.

May these contributions pave the way for the broad and open waters ahead with all the new developments in artificial intelligence and break down the physical barriers imposed on us by space and time to create a special environment “Just for Us”!

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