# Guest editorial: Hyperscale computing for edge of things and pervasive intelligence

Cloud computing is widely utilized in Internet of Things based applications to handle big data, whereas edge computing is preferred to deal with real-time instant data from sensors and users. Edge of things finds applications in automation, smart city, digital healthcare and autonomous systems to enhance the quality of life. Because the data generated by sensors increase in every passing day, it is required to increase the storage capacity and computing power of edge devices. The performance of smart devices and connected vehicles is improved by deploying intelligent computing with smart networking solutions. Edge of things and pervasive intelligence force us to increase the computing power of edge devices using hyperscale computing.

Intelligent sensors and cameras provide data in the form of signal, image and video, and it is necessary to analyze the data using deep learning techniques. Hyperscale computing focuses on storage, networking and computation to store the acquired data, transmit data through networks and process the data to create actionable results. Due to the increase in intelligent devices and smart systems, pervasive intelligence emerged as a major technology for intelligent decision making with low latency. In smart city applications, edge analytics and smart devices are essential to improve the reliability and performance of communication systems.

The special issue focuses on hyperscale computing for edge of things and pervasive intelligence. The first paper, titled "Shifted Rayleigh filter: a novel estimation filtering algorithm for pervasive underwater passive target tracking for computation in 3 D by bearing and elevation measurements," introduces a shifted Rayleigh filter for three-dimensional (3D) underwater target tracking. A comparison is drawn between the shifted Rayleigh filter and previously proven method unscented Kalman filter. The second paper, "Efficient techniques of fractional-N phase locked loop for pervasive wireless applications," proposes a new phase-frequency detector with the removal of dead, blind zones and a modified charge pump to minimize the mismatch of currents. The purpose of this paper to ensure the rapid developments in the radio frequency wireless technology; the synthesis of frequencies for pervasive wireless applications is crucial by implementing the design of low voltage and low power fractional-N phase locked loop for controlling medical devices to monitor remotely patients. The third paper, "An optimized deep learning-based trust mechanism in VANET for selfish node detection," aims to develop a trust mechanism in a vehicular *ad hoc* network based on an optimized deep learning for selfish node detection. The authors built a deep learning-based optimized trust mechanism that removes malicious content generated by selfish VANET nodes. This deep learning-based optimized trust framework is the combination of the Deep Belief Network-based Red Fox Optimization algorithm. A novel deep learning-based optimized model is developed to identify the type of vehicle in the non-line of sight condition.

The fourth paper, "Underwater target tracking in three-dimensional environment using intelligent sensor technique," aims to target tracking in the marine environment is typically obtained by considering the measurement parameters like frequency, elevation and bearing.

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Marine environmental surveillance provides critical information and assistance for the exploitation and maintenance of marine resources. With the use of intelligent sensor techniques like Hull-mounted and towed array sensors, convenient, precise and dependable 3D underwater target tracking is introduced. In the fifth paper, "A novel utilization-aware and power-delay-aware intelligent DMA controller for video streaming used in AI applications," high-performance direct memory access controller (DMAC) is incorporated in SoC to perform the multiple data transfers without the participation of main processors. But achieving the area-efficient and power-aware DMAC suitable for streaming the multiple data remains to be a daunting challenge among the researchers. The purpose of this paper is to provide the DMA operations without intervention of central processing unit for bulk video data transmissions. The sixth paper, "Six sigma DMAIC approach based mobile application for statistical analysis of COVID-19 data," aims to study issues like viral transmission, mortality rates and vaccination rates and also provides suitable solutions based on the statistical analysis with the assistance of the Six-Sigma Define-Measure-Analyse-Improve-Control (DMAIC) concept. Statistical analysis is done for different countries, and the required solutions are provided by using the DMAIC procedure. This application has the ability to represent the current risk status of the user and notify them to secure themselves.

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