Editorial

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Biographical notes: Suresh Ponnan graduated in Electronics and Communication Engineering from the Anna University in 2008. In 2010, he received his Master's in Embedded System Technologies from the University Department, Anna University of Technology. He obtained his Doctorate in the Faculty of Electrical Engineering from the Anna University, in 2014. His research interests are in the field of optical engineering, photonics, IOT, system on chip, reconfigurable computing and embedded systems. He worked in various institutions designated in various positions for more than 12 years. Currently, he is working as a Professor in Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, India. He is associated with many professional societies like the IEEE from 2010 and obtained senior member recognition in 2019. He is a member at the Chartered Engineer from Institution of Engineers, India, in 2019. He is a Life Fellow of the Optical Society of India from 2018. He is associated with the OSA Community from 2013 and designated in different membership grades. He delivered his research contribution in various technical meetings and conferences. He has published more than 50 journal articles in reputed journals. He edited technical books in Springer Publishers, IGI Global, CRC Press (Taylor and Francis Group), etc.

Celestine Iwendi received his second Master's in Communication Hardware and Microsystem Engineering from the Uppsala University, Sweden, in 2008, ranked under 100 in the world university ranking, and PhD in Electronics from University of Aberdeen, UK, in 2013. He is currently a Visiting Professor at the Coal City University Enugu, He is also an ACM Distinguished Speaker, Senior Lecturer with the Bangor College China, where he has strong teaching emphasis on communication, hands-on experience, willing-to-learn and 20 years technical expertise and currently teaches with strong research emphasis in engineering team project, circuit theory, data networks and distributed systems, artificial intelligence, cybersecurity, machine learning and control systems. He is currently a board member of the IEEE Sweden Section, a wireless sensor network chief evangelist, researcher and designer. He is a highly motivated and hardworking researcher with a wireless sensor network security book, and more than 100 publications. He is a Fellow of The Higher Education Academy, UK.

1 Introduction

Artificial intelligence (AI) and simulation overlap increasingly as computer hardware prices fall and software sophistication increases. AI programming methods permit more realistic and robust simulation models and help the user develop, run, and interpret simulation experiments. Simulation algorithms permit expert systems to reason about complex models that change over time or include interacting stochastic elements. This special issue describes basic concepts in AI, applications and highlights expected benefits in each field over the next decade.

AI is a kind of simulation that involves a model intended to represent human intelligence or knowledge. An AI-based simulation model typically mimics human intelligence such as reasoning, learning, perception, planning, language comprehension, problem-solving and decision making. Theory of modelling and simulation has been reconsidered recently based on two new paradigms: the computational iterative system paradigm and the computational activity paradigm. The computational iterative system paradigm allows modelling abstractly input/output systems, which are then explicitly refined until their computational mechanisms with AI.

AI is disrupting this process by creating scalable and efficient workflows to drive productivity and reduce time-to-market. Though many software companies are still in the early stages of AI application, the use of the technology is growing steadily across the enterprise. AI algorithms and advanced analytics allow software development teams to make instant decisions using real-time data at scale. Unlike machines that react to rules-based logic or deliver pre-determined responses, AI applications perform complex and intelligent functions associated with human thinking. By capturing and analysing data from a variety of sources – including microchips, sensors, and remote inputs – AI algorithms can automate the coding process by using that data to help developers create accurate code, leading to more efficient, agile and scalable workflows.

Scheming software system code is an essential, complex, and demanding stage of the development process, particularly for teams located across geographies. Planning and designing a project requires developers, designers, R&D, and marketing teams to work collaboratively by being transparent and communicating effectively.

Additionally, the introduction of AI-related capabilities into various computing devices with traditional means that these traditional processor classes are evolving to the point where they are no longer recognisable as distinct categories. Increasingly, designers of AI-enabled systems are using highly integrated heterogenous processing solutions, such application-specific integrated circuits (ASICs) and system-on-chip (SoC) solutions, electronics industry in the world of tariffs and trade.

2 Subject coverage

Suitable topics include, but are not limited, to the following:

- expert systems and simulation models
- high performance computing applications
- next generation for emerging applications
- algorithms, principles and architectures for AI
- natural intelligence (NI) behaviour
- evolutionary computation
- data mining with AI
- computational intelligence
- systems intelligence
- methodologies, tools and operations research
- discrete event and real time systems
- energy, power generation and distribution
- parallel and distributed architectures and systems
- performance engineering of computer and communication system.