**Special Issue on**

**Role of Computational Intelligence in Cyber-Physical Energy Systems (RCICPES)**

**Aim and Scope:**

Cyber-physical energy systems are used to optimise energy usage, boost effectiveness, and cut costs. They combine computer technology with physical systems. Real-time monitoring and management of energy use are accomplished by these systems using sensors, control systems, and communication networks. In order to make decisions that can lower energy usage, boost system performance, and increase dependability, the data collected by these systems is examined. These systems can be used in a variety of contexts, such as structures, transportation networks, and power grids. Cyber-physical energy systems are designed and run in large part by computational intelligence. It helps the systems to respond quickly to changing circumstances and make decisions. For instance, energy demand forecasting and energy generation and distribution optimization can be done using machine learning techniques. Expert systems and fuzzy logic are two examples of artificial intelligence tools that can be used to manage energy use in buildings and other facilities. Computational intelligence can also be utilised for fault identification and diagnostics, reducing downtime and preventing equipment failure. Overall, computational intelligence is crucial for improving the effectiveness, dependability, and adaptability of cyber-physical energy systems.

The application of machine learning algorithms is one of the main areas of research in computational intelligence for cyber-physical energy systems. These algorithms can be applied to energy demand forecasting, energy generation and distribution optimization, and energy consumption management in structures and other facilities. For instance, researchers are investigating how deep learning algorithms may be used to forecast energy usage in smart buildings, which can assist to save energy expenditures and enhance occupant comfort. Another area of research in computational intelligence for cyber-physical energy systems is the use of expert systems and fuzzy logic. These techniques can be used to control energy usage in buildings and other facilities by analyzing sensor data and making decisions based on the current conditions. This can help to reduce energy consumption and improve system performance. Another area that computational intelligence can help to advance is fault identification and diagnosis. Equipment health can be tracked and failure times can be foreseen using machine learning techniques. By doing this, downtime may be cut down and equipment failure can be avoided. As technology continues to advance, it is likely that computational intelligence will become an increasingly important tool in the transition to a more sustainable energy future.

**Topics relevant to the special issue include (but are not limited to) the following topics:**

* Particle Swarm Optimization for optimal power flow in transmission networks.
* Evolutionary optimization for energy management in industrial systems.
* Parameter tuning of cyber-physical energy management systems using computational intelligence and Bayesian optimisation.
* Enhanced diagnosis of equipment and power failure in cyber-physical energy systems using computational intelligence.
* Design and development of a computational intelligence model for the detection of power requirements in a smart household.
* Machine learning-based prediction of energy consumption in data centres.
* Forecasting model for solar power generation using computational intelligence.
* Sentiment analysis of energy-related social media data using Natural language processing.
* Optimising the demand response in smart energy and power grids using reinforcement learning.
* Development of a fuzzy logic-based controller for wind energy farms.

**Important Dates:**

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