

Industrial Cyber Blockchain Physical System for Microgrid in Data Based Predictive Analysis for Automatic Control Analysis

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Abstract

As an efficient distributed renewable energy utilization model, a microgrid is predictable to realize the higher incorporation of the industrial cyber-physical system (CPS) that has gained significant interest in the academia and industry fields. Electric grid is now facing exceptional variations in generation and load as rising number of distributed energy resources (DERs), typically interfaced via power electronics converter, have been positioned, which possess multifaceted technical problems. In the context of electric grid, Blockchain (BC) was primarily developed for peer-to-peer energy trading through cryptocurrency. This paper presents a deep learning based predictive model for automated control analysis (DLBPM-ACS) in BC assisted industrial CPS environment. The presented DLBPM-ACS technique aims to forecast the short-term energy requirement for reducing the delivery cost of electrical energy for consumers. In addition, the presented DLBPM-ACS technique employs BC for effective energy utilization monitoring and trading control. Moreover, the presented DLBPM-ACS technique employs deep belief network (DBN) model for energy prediction process. Furthermore, the artificial ecosystem optimizer (AEO) algorithm is applied for optimal tuning of the hyperparameters related to the DBN approach. A wide range of simulations was conducted and the outcomes demonstrate the better outcomes of the DLBPM-ACS technique.

Keywords: Industrial CPS, Microgrids, Blockchain, Deep belief network, Prediction models