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Canonical Correlation Analysis Based Hyper Basis Feedforward Neural Network Classification for Urban Sustainability

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Abstract

People give more importance concerning the overall quality of the modernized ecosystem. The pollution of air is one of the significant problems to be resolved as it restricted the ecological transformation of the modernized ecosystem. Therefore, it is fundamental to evaluate the implication of these ecological issues to enhance the urban ecosystem. This vital purpose of this research is to propose a canonical correlation analysis based hyper basis feedforward neural network classification (CCA-HBFNNC) model for evaluating sustainable urban environmental quality. The CCA-HBFNNC model initially acquires a large size of U.S. air pollution dataset as input. Then, a canonical correlative analysis based feature selection algorithm is applied in the CCA-HBFNNC model to select the key pollutant features, which bear fundamental implications to the modernize air pollution to maintain the level of urban sustainability. After the feature selection process, the CCA-HBFNNC model applies the HYPER BASIS FEEDFORWARD NEURAL NETWORK CLASSIFICATION (HBFNNC) algorithm in order to classify input air data based on chosen pollutants features. During the classification process, the HBFNNC algorithm used three critical layers namely hidden, output and input layers for efficiently categorizing each input data as higher or lower pollution level with higher accuracy. If the level of air pollution on the urban environment is higher, finally CCA-HBFNNC model significantly reduces the pollution level. In this way, the CCA-HBFNNC model attains improved urban sustainability levels when compared to sophisticated operation. An experimental evaluation of the CCA-HBFNNC model is determined in terms of CCA-HBFNNC model, time complexity and false-positive rate in consideration of the diversified number of air data retrieved from the big data sets. An investigational result shows that the proposed CCA-HBFNNC model can increases the sustainability level and minimizes the time complexity of urban development when contrasted with contemporary works.

Keywords:
Air pollution, Big data, Canonical correlation analysis, Gaussian activation function, Urban sustainability

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