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Identification of Nonlinear Systems Using Radial Basis Function Neural Network

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Abstract : This paper uses the radial basis function neural network (RBFNN) for system identification of nonlinear systems. Five nonlinear systems are used to examine the activity of RBFNN in system modeling of nonlinear systems; the five nonlinear systems are dual tank system, single tank system, DC motor system, and two academic models. The feed forward method is considered in this work for modelling the non-linear dynamic models, where the K-Means clustering algorithm used in this paper to select the centers of radial basis function network, because it is reliable, offers fast convergence and can handle large data sets. The least mean square method is used to adjust the weights to the output layer, and Euclidean distance method used to measure the width of the Gaussian function.

Keywords : system identification, nonlinear systems, neural networks, radial basis function, K-means clustering algorithm
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