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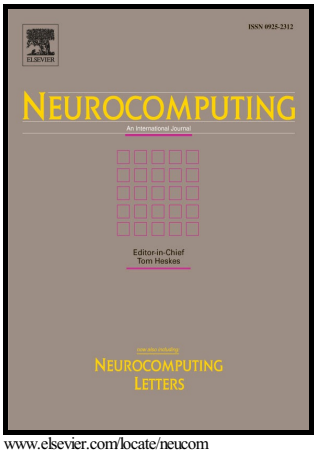

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Uniform stable radial basis function neural network for the prediction in two mechatronic processes

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Uniform stable radial basis function neural network for the prediction in two mechatronic processes

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Abstract

The stable neural networks are the models where their variables and parameters remain bounded through the time and where the overfitting is avoided. A model with overfit has many parameters relative to the number of data, and it has poor predictive performance because it overreacts to minor fluctuations in the data. This paper presents a method to obtain a stable algorithm for the learning of a radial basis function neural network. The method consists of: 1) the radial basis function neural network is linearized, 2) the algorithm for the learning of the radial basis function neural network is introduced, 3) stability of the mentioned technique is assured, 4) convergence of the suggested method is guaranteed, and 5) boundedness of parameters in the focused technique is assured. The above mentioned method is applied for the learning of two mechatronic processes.

Keywords: Radial basis function neural network, stability, learning, mechatronic process.

1 Introduction

Neural networks are some kind of intelligent techniques which have been employed for the prediction, pattern recognition, modeling, control, and classification in the mechatronic processes.

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