

## عنوان مقاله:

Thermal, ANFIS, and Polynomial Neural Network Models for Predicting Environmental Variables in an Arch Greenhouse

## محل انتشار:

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## خلاصه مقاله:

The aim of this study was to design an Adaptive Neuro-Fuzzy Inference Mechanism (ANFIS) and a Polynomial Neural-Network (PNN) to improve modeling and identification of some climate variables within a greenhouse. Furthermore, a Stable Deviation Quantum-Behaved Particle Swarm Optimization (SD-QPSO) algorithm was employed as a learning algorithm to train the constant parameters of ANFIS and PNN structures. To denoise measured data, a wavelet transform method was applied to ensure that no measured data exceeds a predefined interval. Moreover, to show the modeling performance, a set of differential equations were derived as a dynamical model based on the computation of energy and mass balance in a specified greenhouse. The results of modeling and simulation were evaluated with the experimental results of an experimental arch greenhouse. The results showed that the proposed models were more accurate in predicting greenhouse climate and could be used more easily. Moreover, this study showed that the PNN model with less pop-size and evaluation function was more effective than the ANFIS structure to predict the temperatures of inside air and inside roof cover. In this study, an on-line identification system is also proposed for real time identification of experimental data. The obtained simulation results show that performance of the proposed modeling structures and identification system are effective to predict and identify the soil surface, internal air, and roof cover temperatures of the greenhouse. This study shows that the identification algorithm can be used to predict and confirm the results of the model.

## کلمات کلیدی:

.Denoising data, Modeling, PNN, SD-QPSO, Wavelet

## لینک ثابت مقاله در پایگاه سیویلیکا:

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