

Efficient Neural and Fuzzy Models for the Identification of Dynamical Systems

Authors : Aouiche Abdelaziz, Soudani Mouhamed Salah, Aouiche El Moundhe

Abstract : The present paper addresses the utilization of Artificial Neural Networks (ANNs) and Fuzzy Inference Systems (FISs) for the identification and control of dynamical systems with some degree of uncertainty. Because ANNs and FISs have an inherent ability to approximate functions and to adapt to changes in input and parameters, they can be used to control systems too complex for linear controllers. In this work, we show how ANNs and FISs can be put in order to form nets that can learn from external data. In sequence, it is presented structures of inputs that can be used along with ANNs and FISs to model non-linear systems. Four systems were used to test the identification and control of the structures proposed. The results show the ANNs and FISs (Back Propagation Algorithm) used were efficient in modeling and controlling the non-linear plants.

Keywords : non-linear systems, fuzzy set Models, neural network, control law

Conference Title : ICACSTA 2022 : International Conference on Adaptive Control Systems, Techniques and Analysis

Conference Location : Istanbul, Türkiye

Conference Dates : July 28-29, 2022