Abstract

Flow rates of oil, gas and water are most important parameters of oil production that is detected by Multiphase Flow Meters (MFM). Conventional MFM collects data on long-term, because of the radioactive source is used for detection and in unmanned location used due to being away from wells. In this work, a new method based on feed-forward artificial neural
network (ANN) and Imperialist Competitive Algorithm (ICA) have been proposed to predict oil flow rate of the wells. The proposed algorithm combines the local searching ability of the gradient–based back-propagation (BP) strategy with the global searching ability of imperialist competitive algorithm. Imperialist Competitive Algorithm is used to decide the initial weights of the neural network. The ICA-ANN is applied to predict oil flow rate of the wells utilizing data set of 31 wells in one of the northern Persian Gulf oil fields of Iran. The performance of the ICA-ANN is compared with ANN and the results demonstrate the effectiveness of the ICA-ANN.

Reference

An Imperialist Competitive Algorithm Artificial Neural Network Method to Predict Oil Flow Rate of the Wells

Index Terms
Computer Science
Evolutionary

Key words
Artificial Neural Network
Back-Propagation
Oil
Flow Rate
Multiphase Flow meter
Imperialist Competitive Algorithm