

عنوان مقاله:

Support vector regression for prediction of gas reservoirs permeability

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خلاصه مقاله:

Reservoir permeability is a critical parameter for characterization of the hydrocarbon reservoirs. In fact, determination of permeability is a crucial task in reserve estimation, production and development. Traditional methods for permeability prediction are well log and core data analysis which are very expensive and time-consuming. Well log data is an alternative approach for prediction of permeability because they are usually available for all of the wells. Hence, attempts have been made to utilize well log data to predict permeability. However, because of complicate and non-linear relationship of well log and core permeability data, usual statistical and artificial methods are not completely able to provide meaningful results. In this regard, recent works on artificial intelligence have led to the introduction of a robust method generally called support vector machine (SVM). The term SVM is divided into two subcategories: support vector classifier (SVC) and support vector regression (SVR). The aim of this paper is to use SVR for predicting the permeability of three gas wells in South Pars filed, Iran. The results show that the overall correlation coefficient (R) between predicted and measured permeability of SVR is 0.97 compared to 0.71 of a developed general regression neural network. In addition, the strength and efficiency of SVR was proved by less time-consuming and better root mean square error in training and testing dataset.

کلمات کلیدی:

Permeability; hydrocarbon reservoir; well logs; support vector machine; neural network

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