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Well log lithology classification using supervised and unsupervised machine learning

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This paper is submitted based on the ongoing research project for reservoir characterization. In this paper, several supervised and unsupervised machine learning algorithms were successfully used to interpret geological facies using well log data. The supervised machine learning algorithms performed were K-Nearest Neighbors (KNN), Support Vector Machine (SVM), Random Forrest, and a deep neural network using the labeled well log data. Additionally, the Unsupervised Restricted Boltzmann Machine (RBM) neural network learning was also implemented. It is proven that facies classification using well log through machine learning has been a subject of interest and the application to be used largely. The effectiveness of each of these algorithms is shown for a quick and automated lithology classification and the result is further validated using blind well quality control.