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Energy; New Findings from China University of Petroleum in the Area of Energy Described (A Framework for Predicting the Production Performance of Unconventional Resources Using Deep Learning)

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2021 AUG 6 (VerticalNews) -- By a News Reporter-Staff News Editor at Energy Weekly News -- Investigators publish new report on Energy. According to news reporting originating from Beijing, People's Republic of China, by VerticalNews correspondents, research stated, "Predicting the production performance of multistage fractured horizontal wells is essential for developing unconventional resources such as shale gas and oil. Accurate predictions of the production performance of wells that have not been put into production are necessary to optimize hydraulic fracture parameters prior to operation."

Funders for this research include National Natural Science Foundation of China (NSFC), Major Scientific and Technological Projects of CNPC, Applied Fundamental Research Project of Qingdao, Nanogeosciences Laboratory at the **Bureau of Economic Geology**, Jackson School of Geosciences, The University of Texas at Austin, Mudrock Systems Research Laboratory (MSRL) at the **Bureau of Economic Geology**, Jackson School of Geosciences, The University of Texas at Austin.

Our news editors obtained a quote from the research from the China University of Petroleum, "However, traditional analytic methods are made inefficient by their strong dependency on historical production data and their huge computational expense. To conquer this issue, we developed deep belief network (DBN) models to predict the production performance of unconventional wells effectively and accurately. We ran 815 numerical simulation cases to construct a database for model training and optimized the hyperparameters of our network model using the Bayesian optimization algorithm. DBN models exhibit greater prediction accuracy and generalization ability than traditional machine-learning techniques such as back-propagation (BP) neural networks, and support vector regression (SVR). We also used the trained DBN model as a proxy to optimize the fracturing design and obtained outstanding results. Our proposed model could predict the production performance of an unconventional well instantaneously with considerable accuracy and shows excellent reusability, making it a powerful tool in optimizing fracturing designs."

According to the news editors, the research concluded: "Our work lays a solid basis for anticipating the production performance of unconventional reservoirs and sheds light on the construction of data-driven models in the areas of energy conversion and utilization."

This research has been peer-reviewed.

For more information on this research see: A Framework for Predicting the Production Performance of Unconventional Resources Using Deep Learning. Applied Energy, 2021;295. Applied Energy can be contacted at: Elsevier Sci Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, Oxon, England. (Elsevier - www.elsevier.com; Applied Energy - www.journals.elsevier.com/applied-energy/)

The news editors report that additional information may be obtained by contacting Zhenhua Rui, China University of Petroleum, College of Petroleum Engineering, Beijing 102249, People's Republic of China. Additional authors for this research include Sen Wang, Chaoxu Qin, Qihong Feng and Farzam Javadpour.

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