YANFANG WANG

Data Science in Petroleum Industry

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INDUSTRY EXPERIENCE

Research Intern

PEGASUS VERTEX, INC. | Summer 2019, 2018, 2017 | Houston, TX

- Integrating rheological models into simulation software product
- Investigating wellbore temperature evolution during cementing
- Conducting parametric analysis of mud displacement efficiency
- Developing 3D Finite Element methods(FEM) with CFD tool
- Evaluating the computational efficiency of software product
- Validating with real cases and composing research papers

Engineering Intern

SINOPEC | Summer 2013, 2016 | Beijing, China

- Comparing hydraulic fracturing and production forecast simulators
- Conducting experimental study of foam rheology and foam stability
- Presenting key findings to colleagues for internal evaluation

RESEARCH EXPERIENCE

Foam Modeling Techniques in Drilling and Production

Louisiana State University | Jan 2015 – May 2021 | Baton Rouge, LA

- Implementing Python programs for transient foam liquid unloading
- Investigating foam bullheading treatment for gas kick control
- Studying foam drilling process in vertical/inclined wellbore
- Characterizing complex fluid rheological behaviors in wellbore
- Optimizing Two-Flow-Regime foam model and data visualization

Optimizing Completion Design for Unconventional Wells

Louisiana State University | Jan 2020 – May 2021 | Baton Rouge, LA

- Exploring the complex interrelation of multi-stage hydraulic fracturing completion strategy, production performance and profit
- Investigating key parameters for ML regressions with massive dataset
- Comparing ensemble ML methods with Permian basin dataset
- Applying multi-objective optimizations for oil production and profit

Optimizing Drilling Hydraulics for Safe and Efficient Drilling

University of Louisiana, Lafayette | Jan 2013 – Dec 2014 | Lafayette, LA

- Drilling optimization in real-time to warn circulation problems
- Reviewing applications of ANN models using real-time field dataset
- Applying forward regression method for sensitivity analysis
- Developing ANN model to predict pump pressure versus depth

Data-Driven Approach to Select Refracture Candidates

University of Louisiana, Lafayette | Jan 2013 – Dec 2014 | Lafayette, LA

- Choosing representative wells from Zhongyuan oilfiled wells
- Data pre-processing to remove incomplete and noise data points
- Cross-plotting and gray correlation analysis between input & output
- Well refracture candidates with feed-forward back-propagation ANN

EDUCATION

Ph.D. in Petroleum Engineering

Louisiana State University

Jan 2015 – May 2021

Dissertation: An Improved Foam Modeling Technique and Its Application to Petroleum Drilling and Production Practice

M.S. in Computer Science

Louisiana State University

Jan 2019 – May 2021

Project: Optimizing Multi-Stage Hydraulic Fracturing Treatments for Economical Production in Permian Basin Using Machine Learning

M.S. in Petroleum Engineering

University of Louisiana Lafayette

Aug 2012 – Dec 2014

Thesis: Drilling Hydraulics Optimization Using Neural Network Systems

SKILLS

Programming Languages: Python C/C++ MATLAB VBA Shell

Machine Learning Tools: Scikit-learn Pandas Pytorch TensorFlow

Databases: MySQL

Source Control: GitHub

PUBLICATIONS

SPEMPD'20 Wang *et al. Numerical Modeling, Simulation and Lab Testing of Foam-Assisted Mud Cap Drilling Processes Dealing with Non-Newtonian Foam Rheology*

SPETTSERC'18 *Wang et al. Modeling of Foam-Assisted Wellbore Cleanup and Drilling Processes with Both Dry- and Wet-Foam Rheological Properties*

JERT'15 *Wang et al. Application of Real-Time Field Data to Optimize Drilling Hydraulics Using Neural Network Approach*

SPEDECE'15 *Wang et al. Drilling Hydraulics Optimization Using Neural Networks*

JPSE'14 *Wang et al. Refracture Candidate Selection Using Hybrid Simulation with Neural Network and Data Analysis Techniques*