Wei Ma

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EDUCATION

Texas A & M University (College Station, TX)	09/2019 – 12/2024
Ph.D. Petroleum Engineering (In progress): Advised by Dr. Kan Wu	**GPA: 3.68/4.0**
Institute of Rock and Soil Mechanics, Chinese Academy of Sciences	09/2016 – 06/2019
M.S. Geotechnical Engineering (Outstanding Graduate Student)	**GPA: 3.8/4.0**
Central South University, Changsha, China	09/2012 – 06/2016
B.S Mining Engineering	**GPA: 3.8/4.0**

TECHNICAL SKILLS

Skills Summary: Reservoir and Fracture Simulation, Computational Geomechanics and Fluid Mechanics, Fracture Diagnostics, Machine Learning and Data Analysis, RTA, DCA, History Matching, Enhanced Geothermal Systems, CCS

Reservoir Simulation: ECLIPSE, Petrel RE, INTERSECT, CMG, Whitson$^+$, ResFrac, OpenFoam, TOUGH

Data Analysis: NumPy, Pandas, SciPy, Seaborn, Power BI, Spotfire, Matplotlib

Software Development: Git, GitHub, Flask, API, Azure Platform

Programming: Python, C++, Fortran, MATLAB, JavaScript

WORK EXPERIENCES

Reservoir Engineering Intern, Hess Corporation (Houston, TX)   05/2024 - 08/2024

Project: Developing an Assisted Automatic History-Matching Workflow for 2000+ Wells

- Developed modular Python code to automate the end-to-end process of history matching, including acquiring production-related data from Whiston+, generating inputs for Eclipse, running simulations, and analyzing history matching results post-simulation.
- Implemented the optimization-assisted algorithm and Monte Carlo techniques for history matching.
- Developed a proxy to automatically generate PVT tables for wells in different areas of the Bakken, ensuring accurate history matching across multiple wells and avoiding manual calculations.
- Designed a proxy-based MCMC and optimization workflow to speed up the history-matching process.

Scientific Computing Intern, SLB (Houston, TX)   05/2023 - 08/2023

Project: Modeling Downhole Notching and Jetting during Hydraulic Fracturing

- Developed a predictive model for hydraulic jetting from extensive datasets using regression analysis.
- Established an analytical model for predicting the hydraulic notch depth, validated by experimental data.

PROFESSIONAL STUDIES

Computational Geomechanics Project: Parent and Infill Well Development in Unconventional Reservoirs

- Developed a 3D coupled thermal-hydraulic-mechanical (THM) model for fractured unconventional reservoirs.
- Implemented Embedded Discrete Fracture Model (EDFM) for explicit fracture modeling in large-scale formations with up to **5 million** grids.
- Implemented an integrated workflow from hydraulic fracturing to reservoir performance modeling to optimize the completion design.

Machine Learning Assisted Automatic Data Interpretation: Distributed Strain Sensing (DSS) Dataset

- Developed an integrated workflow for real-time data interpretation of distributed strain sensing measurements through coupled fluid flow and geomechanical modeling.
- Created XGBoost and neural network proxy models for fast simulation, reducing computational time significantly.
- Improved feature set via statistical tests (T-test, F-test, MI, etc.), boosting R-squared accuracy by **10%**.
- Developed a proxy-based MCMC for efficient field-measured strain calibration and automatic history matching.
- Efficiently processed **500,000** samples with MCMC to derive uncertain distributions of fracture geometry within **30 minutes**.

Machine Learning Project: Predict the Rate of Penetration (ROP) - TAMU-SPE Chevron Datathon

- Performed feature engineering through correlation analysis, outlier handling, and domain knowledge.
- Developed and optimized regression models including KNN, random forest, and gradient boosting.
- Enhanced regression model performance by **8%** with systematic hyperparameter tuning and cross-validation.

SELECTED PUBLICATIONS

- **Ma, W.**, et al. (2025). Characterizing And Predicting Notch Depth In Hydraulic Jetting: A Comprehensive Model and Sensitivity Study. SPE/ICoTA Well Intervention Conference & Exhibition, the Woodlands, Texas, USA.
- **Ma, W.**, et al. (2024). Machine-learning Workflow for Fracture Geometry Characterization and Production Performance Evaluation using High-Resolution Distributed Strain Sensing, presented at the SPE Annual Technical Conference and Exhibition, New Orleans, USA.
- **Ma, W.**, et al. (2024). Investigation of Effective Fracture Height Using Strain Responses in a Vertical Monitoring Well During Well Interference Test. SPE Journal.
- **Ma, W.**, et al. (2024). Geomechanics Modeling of Strain-based Pressure Estimates: Insights from Distributed Fiber Optic Strain Measurements, SPE Journal.
- **Ma, W.**, et al. (2024). Investigation of Effective Fracture Height Using Strain Responses in a Vertical Monitoring Well During Well Interference Test, presented at the SPE Hydraulic Fracturing Technology Conference and Exhibition, Woodlands, TX, USA.
- **Ma, W.**, et al. (2023). Characteristics of Fracture Properties from Simulated High-Resolution Distributed Strain Sensing Data during Stable Production, presented at the 57th US Rock Mechanics/Geomechanics Symposium held in Atlanta, Georgia, USA.
- **Ma, W.**, et al. (2022). Fracture Performance Evaluation from High-Resolution Distributed Strain Sensing Measurement during Production: Insights for Completion Design Optimization, presented at SPE/AAPG/SEG Unconventional Resources Technology Conference, Houston, Texas, USA.
- Gao, Y., Pan, Y., **Ma, W.**, et al. (2022). Application of Unsupervised-Manifold-Learning for Productivity Driver Evaluation and Production Forecasting in Unconventional Oil Reservoirs, presented at SPE/AAPG/SEG Unconventional Resources Technology Conference, Houston, Texas, USA.
- Pan, Y., Li, G., **Ma, W.**, et al. (2022). A Novel Mittag-Leffler Function Decline Model for Production Forecasting in Multi-Layered Unconventional Oil Reservoirs, presented at Annual Technical Conference and Exhibition, Society of Petroleum Engineers, Houston, USA.
- Zhou, Y., **Ma, W.**, et al. (2021). Numerical simulation of fracture propagation in freezing rocks using the Extended Finite Element method (XFEM). International Journal of Rock Mechanics and Mining Sciences.

FEATURE ARTICLE

- **Ma, W.**, et al. (2024). Fiber-Optic Strain Measurements Aid Fracture Characterization. Journal of Petroleum Technology, 76 (02): 81–83.

LEADERSHIP

- **Vice President**, TAMU-chapter, American Rock Mechanics Association. 2022 – 2023.
- **Event Director**, TAMU-chapter, American Rock Mechanics Association. 2021 – 2022.