

Zhuang Sun

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EDUCATION

Ph.D. in Petroleum Engineering, The University of Texas at Austin, Austin, Texas 2019
B.S. in Chemical Engineering, Tsinghua University, Beijing, China 2014

RESEARCH INTERESTS

Micromechanics, reservoir geomechanics, CO₂ geological storage

PROFESSIONAL EXPERIENCE

Industry Process Expert Specialist, Dassault Systèmes, San Francisco, California 2020-Present
Postdoctoral Fellow, The University of Texas at Austin, Austin, Texas 2019-2020
Research Assistant, The University of Texas at Austin, Austin, Texas 2014-2019

SELECTED JOURNAL PAPERS

Zhuang Sun, Jianping Xu, D. Nicolas Espinoza, Matthew T. Balhoff (2021). Optimization of Subsurface CO₂ Injection based on Neural Network Surrogate Modeling. Computational Geosciences. 1-12.

Zhuang Sun, Rafael Salazar-Tio, Luca Duranti, Bernd Crouse, Andrew Fager, Ganapathi Balasubramanian (2021). Prediction of rock elastic moduli based on a micromechanical finite element model. Computers and Geotechnics. 135, 104149.

Zhuang Sun, Hui-Hai Liu, Yanhui Han, Mustafa A Basri, Rabah Mesdour (2021). The Optimum Pressure Drawdown for Production from a Shale Gas Reservoir: a Numerical Study with a Coupled Geomechanics Reservoir Model. Journal of Natural Gas Science and Engineering. 88, 103848

Zhuang Sun, Zihao Li, D. Nicolas Espinoza, Matthew T. Balhoff (2020). Fluid-Driven Fractures in Granular Media: New Insights from Numerical Investigations. Physical Review E. 101 (4), 042903.

Zhuang Sun, Hwei Tang, D. Nicolas Espinoza, Matthew T. Balhoff, John E. Killough (2020). Grain-to Reservoir-scale Simulations of Depletion-induced Compaction and Implications on Production Rate. SPE Journal. 25 (03), 1543-1556.

Zhuang Sun, D. Nicolas Espinoza, Matthew T. Balhoff (2018). Reservoir Rock Chemo-Mechanical Alteration Quantified by Triaxial Tests and Implications to Fracture Reactivation. International Journal of Rock Mechanics and Mining Sciences. 106, 250-258.

Zhuang Sun, Hwei Tang, D. Nicolas Espinoza, Matthew T. Balhoff, John E. Killough (2018). Discrete Element Modeling of Grain Crushing and Implications on Reservoir Compaction. Journal of Petroleum Science and Engineering. 171, 431-439.

Zhuang Sun, D. Nicolas Espinoza, Matthew T. Balhoff, Thomas A. Dewers (2017). Discrete Element Modeling of Micro-Scratch Tests: Investigation of Mechanisms of CO₂ Alteration in Reservoir Rocks. Rock Mechanics and Rock Engineering 50 (12), 3337-3348.

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Zhuang Sun, D. Nicolas Espinoza, Matthew T. Balhoff (2016). Discrete Element Modeling of Indentation Tests to Investigate Mechanisms of CO₂-related Chemo-mechanical Rock Alteration. Journal of Geophysical Research: Solid Earth 121 (11), 7867-7881.

CONFERENCE PROCEEDINGS

Zhuang Sun, Rafael Salazar-Tio, Andrew Fager, Bernd Crouse. Micromechanics Digital Rock: Parameterization of Consolidation Level Using a Grain Contact Model. 34th International Symposium of the Society of Core Analysts. Online. 2021.

Zhuang Sun, Abelardo Garza, Rafael Salazar-Tio, Andrew Fager, Bernd Crouse. A Novel 3D Mechanical Earth Modeling of the Volve Field and Its Application to Fault Stability Analysis. 55th US Rock Mechanics/Geomechanics Symposium. Houston, TX, 20-23 June, 2021.

Zhuang Sun, Hwei Tang, D. Nicolas Espinoza, Matthew T. Balhoff, John E. Killough. Pore- to Reservoir-scale Simulations of Depletion-induced Compaction and Implications on Production Rate. SPE Annual Technical Conference and Exhibition. Dallas, TX, 24-26, September, 2018.

Zhuang Sun, Matthew T. Balhoff, D. Nicolas Espinoza. Fluid Injection Induced Fracture Initiation Based on a Resolved CFD-DEM Approach. 52nd US Rock Mechanics/Geomechanics Symposium. Seattle, WA, 20-22 June, 2018.

Zhuang Sun, Matthew T. Balhoff, D. Nicolas Espinoza. Discrete Element Modeling of Micro-Scratch Tests on Rocks Altered by CO₂. 51st US Rock Mechanics/Geomechanics Symposium. San Francisco, CA, 25-28, June, 2017.

Zhuang Sun, Matthew T. Balhoff, D. Nicolas Espinoza. Pore-Scale Modeling of the Effect of Cementation on Rock Indentation Test. 50th US Rock Mechanics/Geomechanics Symposium. Houston, TX, 26-29, June, 2016.

PROFESSIONAL SERVICES AND AWARDS

- Technical committee member, Petroleum – Conventional track lead, 56th US Rock Mechanics and Geomechanics Symposium, 2021
- Session developer and chair of “Production – Geomechanics driven production decline” Symposium, 56th US Rock Mechanics and Geomechanics Symposium, 2021
- Committee Member of “Digital Energy subcommittee” for SPE Annual Technical Conference and Exhibition (ATCE), 2021
- Session Chair of “Production - Injection hazards, faults & fractures stability and reactivation”, 55th Rock Mechanics and Geomechanics Symposium, 2020
- Session Chair of “Interdisciplinary Posters: General considerations”, 55th Rock Mechanics and Geomechanics Symposium, 2020
- SPE 2020 outstanding technical reviewer award, 2020
- Outstanding reviewer, Journal of Petroleum Science and Engineering, 2018
- The University of Texas Graduate School fellowship, 2014-2018
- Outstanding undergraduate thesis award of Tsinghua University, 2014