

Smith Leggett

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Education

- 2018 – 2022 *Ph.D. Petroleum Engineering*
Texas A&M University
- 2010 – 2014 *B.S. Mechanical Engineering*
The University of Texas at Austin; GPA: 4.0

Academic Experience

- 2022 – present Assistant Professor of Petroleum Engineering – Texas Tech University
- Lead PI for Integrated Diagnostics for Interpreting Doublet Heat Sweep Efficiency. This is a multi-institution, DOE-funded, Utah FORGE subaward project aimed at characterizing the subsurface heat exchange efficiency of an enhanced geothermal system.
 - Founded the Texas Tech Gas Lift Consortium, a partnership of operators, service companies, and academia to advance late-life gas lift well technologies

Industry Experience

- 2025 *Founder– SELECTT LLC*
- Trained petroleum engineers and lease operators on intermittent gas lift.
- 2019 – 2020 *Part Time Engineering Consultant – PetroEdge IV*
- Managed oil and gas production allocations for leases employing huff-n-puff IOR.
- 2017 – 2018 *Facilities Engineer (Field based) – Occidental Petroleum*
- \$700M+ capital efficiency improvement by modularizing vintage test separators.
 - Led the management of change (MOC) program for facility maintenance projects.
 - Sized and specified pressure vessels, centrifugal pumps, PVF and PSVs.
- 2016 – 2017 *Workover/Completion Specialist (Field based) – Occidental Petroleum*
- Managed well sites for workover operations including cement squeezes, sucker rod, ESP, gas lift, acidizing, wireline, slickline, and casing repairs.
 - Led a culture of safe operations through a behavior-based observation program.
- 2014 – 2016 *Production/Completions Engineer – Occidental Petroleum*
- Designed and executed value added well repair, enhancement, and production optimization projects including paraffin removal, acid stimulations, artificial lift parameter adjustments, lift revisions and repairs of gas lift, plunger lift, sucker rod pump, and ESP systems, and recompletions.
 - Designed vertical gas well fracture treatments; wrote slickline, wireline, and coil-tubing cleanout procedures; created frac, coiled tubing, and workover cost estimating tools.

Research

Research Proposals and Funding

2025	Co-PI, 13% credit. Public Wireless Supply Chain Innovation Fund Grant Program - Software Solutions for Industry Verticals and Integration Automation. DOC National Telecommunications and Information Administration. \$6,740,822/\$51,852,477. Submitted.
2025	PI. Texas Tech Gas Lift Consortium – Added Member. <u>\$50,000/\$50,000. Awarded</u>
2024	Co-PI, 5% credit. MRI: Acquisition of Integrated MTS Systems for Advancing Civil Engineering Infrastructure Research and Education as a Regional Hub in West Texas. NSF. \$58,300/\$1,166,000. Not awarded.
2024	Co-PI. 50% credit. Physics-Informed Adaptive Sparse Reconstruction and Uncertainty Quantification for Enhanced Geothermal Energy Systems. \$209,688/\$419,377. Not awarded.
2024	Co-PI, 5% credit. A Comprehensive Training Program for Graduate Students in the Energy Field. Department of Education. \$69,166/\$1,383,326. Not awarded.
2024	Co-PI, 30% credit. One Earth Sequestration Carbon Capture and Storage. Department of Energy. \$221,640/\$738,800. Submitted.
2023	PI. Early Career Gulf Research Program. National Academies of Sciences, Engineering, and Medicine. <u>\$75,000/\$76,000. Awarded.</u>
2023	PI. Texas Tech Gas Lift Consortium. Joint Industry Project. <u>\$750,000/\$750,000. Awarded.</u>
2023	PI. Multiplanar Fracture Monitoring Using Distributed Fiber Optic Sensors. Cenovus. <u>\$136,000/\$136,000. Awarded.</u>
2023	PI. Reservoir Pressure and Fracture Width Characterization in Horizontal Wells using Fiber Optic Distributed Strain Sensing: A Cross-Disciplinary Approach. Neubrex Energy Services. \$300,000/\$300,000. Not Awarded.
2023	PI. Rheology Changes in Vertical Foam Flows Induced by Liquid Hydrocarbons. American Chemical Society Petroleum Research Fund. \$220,000/\$220,000. Not awarded.
2023	PI. Cradle to Grave Gas Lift. Estis Compression <u>\$130,000/\$130,000. Awarded.</u> Renewed 2024.
2023	PI. Integrated Diagnostics for Interpretation of Doublet Heat-Sweep Efficiency. Department of Energy Utah FORGE Solicitation 2022-2 <u>\$2,675,358/\$2,972,621. Awarded.</u>
2023	PI. Advancing Petroleum Engineering Undergraduate Research at Texas Tech. ASME Petroleum Division Grant \$20,000/\$20,000. Not awarded.

Peer Reviewed Journal Publications (Bold indicates myself or my student)

- 2025 **Mensah, E.; Leggett, S.** Submitted. A Model for Intermittent Gas Lift Design and Lift Gas Reduction in Deviated Wells.
- 2025 **Seo, H. Leggett, S.** Submitted. Real-time Detection and Monitoring of Liquid Slugs in Offshore Risers using Distributed Acoustic Sensing.
- 2025 **Nakamoto, R. Leggett, S.** 2025. Development of a Transient Wellbore Heat Transfer Model Validated with Distributed Temperature Sensing Data. *Sensors*. Vol. 25, Iss. 21. <https://doi.org/10.3390/s25216583>
- 2025 **Nwabueze, Q. Leggett, S.** Proppant consolidation and hysteresis in hydraulic fractures: Insights from the application of a strain transfer model for interpreting fracture width changes from distributed fiber optic strain sensing, *Geoenergy Science and Engineering*, Volume 256. <https://doi.org/10.1016/j.geoen.2025.214159>.
- 2025 **Mensah, E.; Leggett, S.** 2025. A Review on the Impact of Fallback Factor on Intermittent Gas and Gas-Assisted Plunger Lifts. *Geosciences*; Vol. 15, Iss. 7. 10.3390/geosciences15070237
- 2024 Arbad N, Watson M, Emadi H, Eytayo S, **Leggett S.** Strategic Qualitative Risk Assessment of Thousands of Legacy Wells within the Area of Review (AoR) of a Potential CO₂ Storage Site. *Minerals*. 2024; 14(4):383. <https://doi.org/10.3390/min14040383>
- 2024 **Nwabueze, Q. A.; Leggett, S.** 2024. Advancements in the Application of CO₂ Capture and 2 Utilization Technologies—a Comprehensive Review. *Fuels*. 5(3), 508-532; <https://doi.org/10.3390/fuels5030028>
- 2024 **Leggett, S.,** Chen, M. 2024. Evaluation of a Rapid Diagnostic Tool to Estimate Geometry Evolution of Multiple Simultaneously Propagating Fractures from Cross-well Fiber Optic Strain Measurements. *SPEJ*. <https://doi.org/10.2118/217820-MS>
- 2023 **Eyinla, Dorcas S., Leggett, Smith,** Badrouchi, Foued, Emadi, Hossein, Adamolekun, Olajide J., and Akinsanpe, Olumuyiwa T. 2023. A comprehensive review of the potential of rock properties alteration during CO₂ injection for EOR and storage. *Fuel* **353**: 129219. <https://www.sciencedirect.com/science/article/pii/S0016236123018331>.
- 2023 **Leggett, Smith,** Sakaida, Shohei, Zhu, Ding, Hill, Alfred Daniel, and Kerr, Erich. 2023. Interpretation of Fracture Initiation Points by In-Well Low-Frequency Distributed Acoustic Sensing in Horizontal Wells. *SPE Journal*: 1-10. <https://doi.org/10.2118/212328-PA>.
- 2023 **Leggett, Smith.** (2023). “LF-DAS Shape Factors for Fracture Front Detection.” *Interpretation*. <https://doi.org/10.1190/INT-2022-0100.1>

(Before Appointment at Texas Tech University)

- 2022 **Leggett, Smith,** Reid, Teresa, Zhu, Ding, and Hill, A. D. 2022. Experimental Investigation of Low-Frequency Distributed Acoustic Strain-Rate Responses to Propagating Fractures. *SPE Journal* **27** (06): 3814-3828. <https://doi.org/10.2118/209135-PA>.

- 2021 **Leggett, Smith**, Zhu, Ding, and Hill, Alfred Daniel. 2022. Thermal Effects on Far-Field Distributed Acoustic Strain-Rate Sensors. *SPE Journal* **27** (02): 1036-1048. <https://doi.org/10.2118/205178-PA>.
- 2014 Allouache, Aimon, **Leggett, Smith**, Hall, Matthew J., Tu, Ming, Baker, Chad, and Fateh, Haiyan. 2015. Simulation of Organic Rankine Cycle Power Generation with Exhaust Heat Recovery from a 15 liter Diesel Engine. *SAE International Journal of Materials and Manufacturing* **8** (2): 227-238. <http://www.jstor.org/stable/26268708>.

Conference Papers

- 2025 **Nwabueze, Q. Leggett, S.** 2025. Application of Strain Transfer Model for Fracture Conductivity Modeling and Monitoring of Enhanced Geothermal Systems. Stanford Geothermal Workshop 2025. https://pangea.stanford.edu/ERE/db/IGAstandard/record_detail.php?id=38081
- 2025 Rose, P. **Abdellatif, M.** Yuan, Q. **Leggett, S.** 2025. The Use of Reversibly Adsorbing Tracers for Characterizing Reservoir Fracture Surface Area in Engineered Geothermal Systems. Stanford Geothermal Workshop 2025. <https://pangea.stanford.edu/ERE/pdf/IGAstandard/SGW/2025/Rose.pdf>
- 2024 Abdelkerim, O., **Leggett, S.**, Lu, J., Nelle, Will . 2024. "High Pressure Gas Lift Optimization Using Nodal Analysis." Paper presented at the SPE Artificial Lift Conference and Exhibition - Americas, The Woodlands, Texas, USA, August 2024. doi: <https://doi.org/10.2118/219533-MS>
- 2024 **Leggett, S.**, Chen, M. 2024. Evaluation of a Rapid Diagnostic Tool to Estimate Geometry Evolution of Multiple Simultaneously Propagating Fractures from Cross-well Fiber Optic Strain Measurements. SPE HFTC 2024. <https://doi.org/10.2118/217820-MS>
- 2023 **Leggett, S.** Fiber Optic Sensing for Production and Operations Diagnostics: Past, Present, and Future. Southwest Petroleum Short Course. April 17 – 20, 2023.
- 2023 Hussain, A., Emadibaladehi, H., **Leggett, S.**, Thiyagarajan, S., and Watson, M. 2023. Implementing Fiber Optics to determine the strain changes in cement in a simulated wellbore environment – Implications of Underground Hydrogen storage. Presented at ARMA.

(Before Appointment at Texas Tech University)

- 2022 **Leggett, S.**, Kerr, E., Zhu, D., and Hill, D. (2022). Rapid Estimations of Dynamic Hydraulic Fracture Fronts from Cross-Well Low-Frequency Distributed Acoustic Sensing Strain-Rate Measurements. Proc., SPE/AAPG/SEG Unconventional Resources Technology Conference. <https://doi.org/10.15530/urtec-2022-3722728>.
- 2015 Cameron, S., Astley, A., **Leggett, S.**, Sirgo, G., & Koo, J. H. (2015). In-situ ablation recession and thermal sensor based on ultra-fine (0.25 mm) thermocouples. In *SAMPE Baltimore 2015*

Conference and Exhibition (International SAMPE Technical Conference; Vol. 2015-January).
Soc. for the Advancement of Material and Process Engineering.

Presentations

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| 2025 | "A Low-Cost Alternative for Measuring Liquid Production in Late-Life Gas Lifted Wells." Permian Basin Artificial Lift and Facilities Forum. November 4-6, 2025. |
| 2025 | "Texas Tech Artificial Lift Center of Excellence." Permian Basin Artificial Lift and Facilities Forum. November 4-6, 2025. |
| 2025 | "Insights into Intermittent Gas Lift – Lessons Learned from the Texas Tech Gas Lift Consortium." Permian Basin Artificial Lift and Facilities Forum. November 4-6, 2025. |
| 2025 | "The Texas Tech Gas Lift Consortium: Research to Advance Late-Life Gas Lift Technologies." NSI Wed(NSI)Day Seminar January 8, 2025. |
| 2024 | "The Texas Tech Gas Lift Consortium: Research to Advance Late-Life Gas Lift Technologies." Artificial Lift Forum. Bush Convention Center, Midland, TX. November 6, 2024. |
| 2024 | "Integrated Diagnostics to Interpret Double Heat Sweep Efficiency." Annual Workshop Utah FORGE webinar. August 15, 2024. |
| 2024 | "A Review of Intermittent Gas Lift and Fallback Factor Modeling". ALRDC Workshop. June, 2024. |
| 2023 | "The Texas Tech University Gas Lift Consortium." Exxon Artificial Lift Q4 Workshop. November 16, 2023. |
| 2023 | "Rapid Characterization of Hydraulic Fracture Geometry Using Cross-well Low-Frequency DAS." SPE Fiber Optic Workshop. Westminister Colorado. August 8-9, 2023. |
| 2023 | "Rapid Assessment of Hydraulic Fracture Extents in Unconventional Completions Using Crosswell Low-Frequency Distributed Acoustic Sensing." ARMA Hydraulic Fracturing Technical Seminar June 1, 2023. |
| 2023 | "Assessing Final Fracture Dimensions Using Crosswell Low-Frequency Distributed Acoustic Sensing: Unlocking Insights through the Zero Strain-Rate Location Method." NSI Wed(NSI)Day Seminar June 14, 2023. |

Awards and Recognitions

2024	Texas Tech Gas Lift Consortium a feature of the Hart Energy article, “Going with the Flow: Universities, Operators Team on Flow Assurance Research.” Published Tuesday, March 3, 2024. Written by Paul Wiseman. link
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Teaching

Courses Taught as Instructor of Record

Graduate

2024	Advanced Artificial Lift Methods, PETR 5306 (4.8/5)
2023 – 2025	Multiphase Fluid Flow in Pipes, PETR 5319 (4.43/5)
2022	Nodal Analysis and Well Optimization, PETR 5314 (4.67/5)

Undergraduate

2023 – 2025	Nodal Analysis and Artificial Lift, PETR 4314, (4.53/5)
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Other Teaching Experience

2022	TeMPO Peer Observation Program Participant
2020	<i>Associate Certification</i> Center for the Integration of Research, Teaching, and Learning (CIRTL). Trained on latest research into effective STEM teaching practices.

Service

Journal paper peer reviewer

2022 – present	SPE Journal
2022	SEG Interpretation

PhD Students Advised as Chair or Co-Chair

2024 – present	Mahmoud Heshmat
2024 – present	Caio Morias
2024 – present	Erasmus Mensah
2023 – present	Queen Nwabueze

Masters Students Advised as Chair

2025 – present	Adkham Izbassar
2025 – present	Rion Nakamoto
2024 – present	David Ofori
2023 – present	Hyojeong Seo
2024 – 2025	Rafael Mahammadov
2023 – 2025	Mohamed Refaat
2023 – 2024	Omar Abdelkarim
2022 – 2023	Dorcas Eyinla

Undergraduate Student Researchers

2024 – present	Andres Meneses Trujillo
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2024 – 2025 Maxwell Frevert
2023 – 2025 Ashley Leon

PhD Students Advised as Committee Member

2024 – 2025 Chinedu Okere
2023 – present Adewale Taiwo
2023 – present Baizheng An
2023 – 2024 Nachiket Arbad

Memberships/Organizations/Service/Certification

2023 – present Southwestern Petroleum Short Course – Chairman of the Board

- Supervise direct report to host two annual conferences, over 1,200 attendees
- 2024 – Initiated and led the SWPSC Student Paper Contest
- 2024 – Secured \$10,000 donation for TTU PETR graduate seminar series
- 2023 – Secured \$25,000 in scholarships for TTU PETR students

2014 – present Society of Petroleum Engineers
2012 Volunteer conversational English teacher in Irbid, Jordan

Service to Department

2024 – 2025 Search Committee – Department Chair
2024 – present Scholarship Committee
2024 – present Relaunched the graduate seminar series
2022 – present Committee Lead, Industry Collaboration Committee

Extracurricular Activities

9/2024 Teaching, Learning, & Professional Development Center – Presenter
What can I expect during my first years as a new faculty member? A Panel Discussion

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