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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
- \$3.8M net \$4.0M gross external funding as PI
 - Founder, Texas Tech Gas Lift Consortium
 - PI, DOE Utah FORGE project
 - National Academies Early Career Award
 - 12 peer-reviewed journal publications and 14 conference papers
 - 2 pending U.S. patent applications
 - 6 Ph.D. students advised

Industry Experience

- 2025 - present *Founder– SELECTT LLC*
- Trained petroleum engineers and lease operators on intermittent gas lift.
 - Provided expert witness services in an oilfield fatality civil case.
- 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*
- \$700k+ 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.

Research

Awarded Research Proposals and Funding \$3,797,837 net / \$4,028,757 gross

2025	PI. Texas Tech Gas Lift Consortium – Added Member. <u>\$50,000/\$50,000.</u>
2023	PI. Early Career Gulf Research Program. National Academies of Sciences, Engineering, and Medicine. <u>\$76,000/\$76,000.</u>
2023	PI. Texas Tech Gas Lift Consortium. Joint Industry Project. <u>\$800,000/\$800,000.</u>
2023	PI. Multiplanar Fracture Monitoring Using Distributed Fiber Optic Sensors. Cenovus. <u>\$136,000/\$136,000.</u>
2023	PI. Cradle to Grave Gas Lift. Estis Compression <u>\$85,337/\$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>\$2,650,500/\$2,972,621. Awarded.</u>

Other Efforts to Secure Funding

2026	ARPA-E IGNITE 2026. \$500,000. Submitted.
2026	DOE Office of Science Early Career Research Program. \$875,000. Not awarded.
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.
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. 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.

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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)

- 2026 **Heshmat, M., Leggett, S.** Submitted. Analytical Modeling of Tracer Pulse Tests with Significant Background Concentration at the Utah FORGE Geothermal Site. *Geothermics*.
- 2026 **Mensah, E.; Leggett, S.** Submitted. A Model for Intermittent Gas Lift Design and Lift Gas Reduction in Deviated Wells. *Gas Science and Engineering*.
- 2026 **Morais, C.; Mensah, E.; Leggett, S.** In Press. Cycle-by-Cycle Liquid Slug Production Measurement from Surface Flowline Instrumentation. *SPEJ*. SPE-234705-PA.
- 2026 **Nakamoto, R., Leggett, S.** 2026. Analytical Model for Thermal Slug Tracking in Enhanced Geothermal Systems. *Geothermics*. Vol. 136.
<https://doi.org/10.1016/j.geothermics.2026.103680>
- 2026 **Seo, H.; Mensah, E.; Almeida, C; Amudzi-Deku A; Leggett, S.** 2026. Monitoring Liquid Slugs Using Distributed Acoustic Sensing and an Air Gun. *Sensors*. Vol. 26, Iss. 4.
<https://doi.org/10.3390/s26041278>
- 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](https://doi.org/10.3390/geosciences15070237)
- 2024 Arbad N, Watson M, Emadi H, Eyitayo 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

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properties alteration during CO₂ injection for EOR and storage. *Fuel* **353**: 129219.
<https://www.sciencedirect.com/science/article/pii/S0016236123018331>.

2023 **Leggett, Smith.** (2023). "LF-DAS Shape Factors for Fracture Front Detection." *Interpretation*.
<https://doi.org/10.1190/INT-2022-0100.1>

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>.

(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>.

Patents and Intellectual Property

2026 **Leggett, S., Lu, Q., & Nelle, W.** (2026). High Pressure Gas Lift Optimization. U.S. Patent Application No. 19/457,493, filed January 23, 2026. Pending.

2026 **Leggett, S., Seo, H., Brasher, M.** (2026). Distributed Acoustic Sensing for Detection and Monitoring of Gas Kick and Liquid Slug Production. U.S. Patent Application No. 19/693,086, filed May 29, 2026. Pending.

Conference Papers

2026 **Ogbuka, J.; Reynolds, R.; Leggett, S.** 2026. Automated High-Pressure Gas Lift Optimization: Coupling Surface Constraints With Subsurface Dynamics. SPE Artificial Lift Conference and Exhibition – Americas 2026. Woodlands, TX. SPE-232991-MS.

2026 **Mensah, E.; Almeida, C.; Leggett, S.** 2026. A Predictive Fallback Factor Model for Intermittent Gas Lift Based on Field-Scale Slug Dynamics Experiments. SPE Artificial Lift Conference and Exhibition – Americas 2026. Woodlands, TX. SPE-232985-MS.

2026 **Almeida, C.; Mensah, E., Leggett, S.** 2026. Cycle-Resolved Slug Production Measurement in Intermittent Gas Lift Wells Using Surface Flowline Instrumentation. SPE Artificial Lift Conference and Exhibition – Americas 2026. Woodlands, TX. SPE-233015-MS.

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- 2026 **Nakamoto, R., Leggett, S.** 2026. Numerical and Analytical Approaches to Production Logging in EGS Using Fiber-Optic Thermal Slug Tracking. 60th US Rock Mechanics / Geomechanics Symposium. June 21-24, 2026. Tucson, AZ.
- 2026 **Heshmat, M., Leggett, S.** 2026. Analytical Modeling of a Negative Sorbing Tracer Pulse Test with Significant Background Concentration at the Utah FORGE Geothermal Site. 60th US Rock Mechanics / Geomechanics Symposium. June 21-24, 2026. Tucson, AZ.
- 2026 **Mensah, E. Leggett, S.** 2026. Insights into Intermittent Gas Lift: Pilot Scale Experiments and Modeling. Southwestern Petroleum Short Course. Lubbock, TX.
- 2026 **Nwabueze, Q. Leggett, S.** 2026. Physics-Based Interpretation of RFS-DSS for Far-Field Monitoring of Fracture Conductivity. SPE Hydraulic Fracturing Technology Conference and Exhibition. Woodlands, TX. SPE-230629-MS
- 2026 **Leggett, S.,** Keough, D., Andriianov, A., Jurick, D. 2026. Deploying Coiled-Tubing Conveyed Fiber Optic Cables at the Utah FORGE Enhanced Geothermal System. Stanford Geothermal Workshop.
- 2026 **Leggett, S., Morias de Almeida, C., Nakamoto, R., Nwabueze, Q. Seo, H.,** Jurick, D. Giri, P. **Yaw Oforio,** D. Yuan, Q. **Abdellatif, M.** 2026. Integrated Diagnostics for Interpreting the Efficiency of the Utah FORGE EGS. Stanford Geothermal Workshop.
- 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>
- 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. Assessing the Viability of Oilwell Cement for 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>.

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- 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

- 2025 "Intermittent Gas Lift Research and Practical Insights." ExxonMobil Artificial Lift Q4 Workshop. December 4, 2025.
- 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." Permian Basin 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." ExxonMobil Artificial Lift Q4 Workshop. November 16, 2023.
- 2023 "Rapid Characterization of Hydraulic Fracture Geometry Using Cross-well Low-Frequency DAS." SPE Fiber Optic Workshop. Westminster 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.

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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](#)

Teaching

Courses Taught as Instructor of Record

Graduate

2024 – 2025 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

2026 Production and Carbon Storage Facilities and Processing

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

Other Teaching Experience

2022 TeMPO Peer Observation Program Participant

2020 *Associate Certification*
Center for the Integration of Research, Teaching, and Learning (CIRTL).

Service

Journal paper peer reviewer

2026 Geothermics

2022 – present SPE Journal

2022 SEG Interpretation

PhD Students Advised as Chair or Co-Chair

2025 – present Rion Nakamoto

2025 – present David Ofori

2024 – present Mahmoud Heshmat

2024 – present Caio Morias

2024 – present Erasmus Mensah

2023 – present Queen Nwabueze

Masters Students Advised as Chair or Co-Chair

2025 – present Jefferson Ogbuka

2025 – present Adkham Izbassar

2025 – 2025 Rion Nakamoto

2024 – 2025 David Ofori

2023 – 2025 Hyojeong Seo

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2024 – 2025	Rafael Mahammadov
2023 – 2025	Mohamed Refaat
2023 – 2024	Omar Abdelkarim
2022 – 2023	Dorcas Eyinla

Undergraduate Student Researchers

2025 – present	Cole Bridges
2025 – present	David Mastrovich
2024 – present	Andres Meneses Trujillo
2024 – 2025	Maxwell Frevert
2023 – 2025	Ashley Leon

PhD Students Advised as Committee Member

2025 – present	Zayed Bin Sultan
2023 – present	Adewale Taiwo
2023 – 2026	Baizheng An
2023 – 2025	Amine Ifticene
2024 – 2025	Chinedu Okere
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 – 2026 – Initiated and led the SWPSC Student Paper Contest • 2024, 2025, 2026 – Secured \$10,000 donation for TTU PETR graduate seminar series • 2026 – Secured \$110,000+ donation for undergraduate research • 2023 – Secured \$25,000 in scholarships for TTU PETR students
2014 – present	Society of Petroleum Engineers • 2025 – 2026 Committee Member, SPE Artificial Lift Conference and Exhibition
2012	Volunteer conversational English teacher in Irbid, Jordan

Service to Department

2025	Manage Department Software ADA Compliance
2024 – 2025	Search Committee – Department Chair
2024 – 2025	Scholarship Committee
2024 – 2025	Relaunched the graduate seminar series
2022 – 2025	Committee Lead, Industry Collaboration Committee

Extracurricular Activities

2025 – 2026	Program Committee Member for the Society of Petroleum Engineers Artificial Lift Conference and Exhibition 2026
9/2024	Teaching, Learning, & Professional Development Center – Presenter <i>What can I expect during my first years as a new faculty member? A Panel Discussion</i>
9/2023	Teaching, Learning, & Professional Development Center – Presenter <i>What can I expect during my first years as a new faculty member? A Panel Discussion</i>