RAJ KIRAN

Assistant Professor
Indian Institute of Technology (Indian School of Mines)
Dhanbad, Jharkhand, India 826004
Email: rajkiran@iitism.ac.in

Contact information

Address: Indian Institute of Technology (Indian School of Mines)
Department of Petroleum Engineering
Sardar Patel Nagar, Dhanbad, Jharkhand, India-826004
Email Address: rajkiran@iitism.ac.in
Google Scholar: https://scholar.google.com/citations?user=oHLGFMIAAAAJ&hl=en
LinkedIn Profile: https://www.linkedin.com/in/raj-kiran-ph-d-a6a76911/
Website: https://www.iitism.ac.in/~rajkiran/

Career Objective

I wish to be recognized as a thought-leader in academics for areas related to data-driven physics-based energy engineering. I aspire to motivate the next generation of engineers to realize their potential and true interest. My research interests encompass drilling, production, and completions engineering. My recent research is focused on data-driven approach on experimental and computational modeling. I envision myself in the forthcoming future contributing to a multidisciplinary, data-driven approach in various aspects of petroleum engineering.

Education

- **University of Oklahoma, Norman** August 2016 - May 2019
  Degree: **Doctor of Philosophy**, Petroleum Engineering, 2016-2019
  Ph.D. Dissertation Title: 'Study of Fluid Dynamics Effects for Loss of Well Control Incidents in Subsea Wells.'
  Advisor: Dr. Saeed Salehi
  GPA: 4.0/4.0
  Awards: MPGE Outstanding PhD Student, Robberson Travel Grant, OU MPGE SPE/SPWLA Best Paper.
  Studies Included: Computational fluid dynamics, multiphase flow, wellbore geomechanics, advanced drilling engineering, well integrity, software development and simulation, and human factors in oil and gas.

- **University of Louisiana at Lafayette** January 2013 - December 2014
  Degree: **Master of Science**, Petroleum Engineering
  MS Thesis Title: 'Finite Element Analysis of Casing While Drilling's Smearing Effect'
  Advisor: Dr. Saeed Salehi
  GPA: 3.91/4.0
  Awards: SPE Deepwater Student Paper (first place), AADE Graduate Scholarship.
  Studies Included: Advanced drilling engineering, advanced production systems, petrophysics, underbalanced drilling, reservoir engineering, enhanced oil recovery, theory and techniques of mathematical reservoir simulation, finite element analysis, project management, statistical engineering, linear and non-linear programming.

- **Indian Institute of Technology, BHU, Varanasi, India** August 2005 - May 2009
  Degree: **Bachelor of Technology**, Civil Engineering
  BTech Thesis: 'Fiber Reinforced Polymer-Boon to Construction Industry'
  Advisor: Professor Veerendra Kumar
  GPA: 8.29/10.0

Research Interests

Geothermal, Geologic Hydrogen, Underground Hydrogen Storage, Carbon Sequestration, Unconventional Oil and Gas, Well Construction and Integrity, Drilling and Completion, Petroleum Data Analytics, Production Engineering, Reservoir Geomechanics, Computational Fluid Dynamics, Finite Element Analysis, Human factors in oil and gas.

Research Experience (Academic and Industry)

Assistant Professor, December 2020 – Present
Indian Institute of Technology (Indian School of Mines), Dhanbad, India
Work Includes

- Research projects sponsored
  - Topic: Coupled Geomechanical and Fluid Flow Study of High-Temperature Wells using FEM and CFD Analysis. Sponsor: University of Oklahoma
  - Topic: Future of Geothermal in India. Sponsor: Project InnerSpace, Inc.
  - Topic: Development of Prospectivity Mapping Framework and Tools for Geological Hydrogen Exploration: Safechem Enterprises Pvt. Ltd. (Spectrum Impact).
- Presented paper in India Energy Week – 2024 on Carbon Sequestration in Basaltic Rocks (Experimental and modeling studies, Resource assessment)
- Developed a framework to identify potential Geologic Hydrogen Exploration locations and implemented in Indian Context.
- Engaged in research related to energy transition (Geothermal, Carbon Sequestration, and Underground Hydrogen Storage) and intelligent well integrity applications for conventional and unconventional wells.
- Geomechanical and fluid flow behavior characterization in high-temperature environment using FEA and CFD analysis.
- Development of AI/ML models focused on operational efficiency of energy transition and oil and gas systems.

Postdoctoral Research Associate, August 2019 – November 2020
Well Construction Technology Center, University of Oklahoma, Norman, OK
Work Included

- Technical report and papers for "***Developing Advanced Lost Prevention Methods and Smart Wellbore Strengthening Materials for Geothermal Wells***" sponsored by ***Department of Energy*** (Award number: DE-EE000862).
- Identification and quantification of well log attributes in unconventional reservoir using Machine Learning.
- Assessment of petrophysical properties and prediction of geohazards in geothermal and unconventional wells using deep learning.
- Study of fluid dynamics effect in geothermal wells and unconventional reservoirs.
- Development of proposals for research and OU presidential dream course (Oil spill response, well integrity, human factors in oil and gas, geothermal).
- Characterization of two-phase flow in the annulus for churn and annular flow regime using Image Processing and TensorFlow.
- Lectured on behalf of Dr. Saeed Salehi
  - PE – 4033: ***Drilling Engineering***, Fall 2019.
  - PE – 4970 and PE – 5970: ***Human Factors and Drilling Simulation***, Spring, 2020.
  - PE – 3313: ***Drilling Engineering***, Fall 2020.
- Created final project for ***Geothermal course*** offered at OU, Fall 2020.

Graduate Research Assistant, August 2016 – May 2019
Advisor: Dr. Saeed Salehi
Well Construction Technology Center, University of Oklahoma, Norman, OK
Primary Research Question

What are the theoretical and practical implications of high velocity multiphase flow in well operations? How can scenario-based training be implemented in petroleum industry? What are the implications and mechanisms of well integrity issues and how can it be addressed?

Work Included

- Holistic study of multiphase flow (in sonic conditions) through wellbores for offshore wells
  - Characterization of two-phase flow under different flow conditions in pipe and annulus at subsonic and sonic conditions (Mach number > 0.3).
  - Experimental study to understand the impact of High Mach number flow properties.
  - Identification of flow-regime in pipe and annulus using numerical modeling (Using **ANSYS** and **Matlab**).
  - Characterization of two-phase flow in the annulus for churn and annular flow regime using CFD Modeling and probability density function (Using **ANSYS** and **Matlab**).
  - Developed the software package to estimate worst-case discharge using **Matlab**/**C++/Visual Basics/VBA**.
  - Performance evaluation of developed software and commercial packages (**Prosper** and **Pipesim)**.
- Investigation and development of offshore operations training framework for enhancing situational awareness, decision-making, and risk communications.
  - Scenario development for Well Control incidents (Matlab and VBA).
  - Development of scenario-based training framework to enhance situational awareness and decision-making.
  - Data analysis for eye-tracking experimental measurements (R and Matlab).
  - Principal component analysis (PCA) and the implementation of item response theory (IRT) for the cognitive study of human factors (R and Python).
  - Objective framework to quantify the performance of participants in well control training by triangulation of data from different subjective and objective measurements such as ocular movement, questionnaire analysis, voice logs, and checklist.
- Identification and evaluation of well integrity issues using numerical and experimental studies.
- Proposals writing for federal and industrial grants.
- Evaluation and development of graduate and undergraduate level academic courses (drilling and human factors).

Researcher & Lab Manager, January 2015 – August 2016

Work Included

- Characterization of drilling fluids filtration and wellbore strengthening using experimental and numerical approach.
- Investigation of surfactant flooding for candidate reservoirs in the upper Assam basin and Louisiana.
  - Established collaboration with Indian University for surfactant flooding project funded by UGC under U.S. – India Educational Foundation (USIEF) - OBAMA-SINGH 21ST Century Knowledge Initiative (OSI) Program.
  - Analysis of experimental data and the development of numerical models.
- Conducted laboratory courses for reservoir and drilling engineering.
- Extensive hands-on experience with all petroleum engineering department laboratory equipment and software.

Graduate Research Assistant, January 2013 – December 2014

Advisor: Dr. Saeed Salehi

University of Louisiana at Lafayette, 2013 – 2014

Primary Research Question

What is the role and mechanism of wellbore strengthening in the casing while drilling and how can it be simulated in numerical environment? How artificial neural network can be applied for determination of flue gas minimum miscibility pressure?

Work Included

- Numerical analysis of Casing Drilling Smearing (Sponsor: Weatherford International)
  - Simulated the Poro-elastic wellbore in Abaqus to analyze the wellbore strengthening effect.

  - Numerical model for the analysis of wellbore strengthening for real-time scenarios.
- Artificial Neural Network (ANN) for the determination of Flue Gas Minimum Miscibility Pressure (MMP).
  - Developed the ANN model to analyze the experimental data and consequently trained and validated the model to predict the minimum miscibility pressure for fluid samples from the South Louisiana field (Matlab).
  - Compared different correlations to calculate MMP with the field scale data.

Teaching/Mentoring Experience

Assistant Professor, December '20 – Present
Indian Institute of Technology (Indian School of Mines), Dhanbad, India

- Orchestrated several undergraduate-level courses (PEC513 – Introduction to Python and Petroleum Data Analysis, PED502 – Well Intervention, Workover and Stimulation Techniques, PED401 – Offshore Drilling and Petroleum Production Practices, PEE202 – Petroleum Environment Management, PEC204 – Reservoir Engineering Lab, PEC210 – Drilling Simulation Lab, PEC13201 – Drilling Fluid and Cement Slurry Lab)
  - Developed course content, assignments, lectures, and group and individual projects.
  - Developed the course outline for Drilling Simulation Lab.
  - Developed project on Gen AI for students.
- Mentored 9 M. Tech. Students (Mr. Siddharth Miglani, Mr. Anas Mohammed, Mr. Lokesh Kumar Sekar, Mr. Vimal Raj, Mr. Ravi Kant Verma, Mr. Chaitanya Bathula, Mr. Rohan Patil, Mr. Chinmay Ambawale, Mr. Mukul Rajput)
- Supervising one full-time (Mr. Mohd. Saif) and two part-time PhD Scholars (Mr. Parmod Sharma and Mr. Vikash Raj.

Graduate Teaching Assistant, August '13 – December '14
Petroleum Engineering, University of Louisiana at Lafayette

- Co-orchestrated several undergraduate-level courses (Phase Behavior – PETE 382, Drilling Engineering – PETE 391, Computers Applications in Petroleum Engineering – PETE 484, Improved Petroleum Recovery Processes – PE 482, Rock Mechanics – PE 481.
  - Planned course content, assignments, lectured, and coordinated group and individual projects.
- Conducted laboratory courses: (Drilling Fluids – PETE 391 and Drilling Engineering – PETE 491).
  - Developed course content and assignments and coordinated group experiments.
- Wrote the drilling engineering laboratory manual and created several projects for teaching purposes.
- Developed the ABET Accreditation document for the Petroleum Engineering Department.

Industrial Experience

Operations Engineer, June '18 - August '18
Nabors Drilling USA Ltd, Houston, TX

- Conducted an in-depth study of connection time on the different types of rigs and proposed the means to reduce it.
- Analyzed the survey response data to assess the human factors and safety in the drilling operation.
- Presented the comparison of operational and design aspects of different rig types and ways to improve.

Design Engineer, September 2009 - December 2012
Samsung Engineering India Pvt Ltd, India

- Actively involved in ONGC- OPaL, Dahej, India (US $ 4.3bn), Natural Gas Jubail Field Development Project VIII-Jubail, Saudi Arabia, and ASMEDA Proposal- Egypt; synthesized structural analysis and design calculations (Excel, Mathcad), coordinated with Client-side engineers and Korean Counterparts.
- Led the Team of OPaL HDPE Petrochemical-Project in the absence of project manager.

Honors and Awards

Scholarships and Awards

- Received Sandbox initial seed funding for AI-based innovative startup from Massachusetts Institute of Technology, 2019 (Starting amount: $3500).
- **Outstanding Ph.D. Student** in **Mewbourne School of Petroleum and Geological Engineering** for academic excellence, University of Oklahoma, 2018.
- **Robberson Travel Grant** for research paper presentation at OMAE 37th International Conference on Ocean, Offshore & Arctic Engineering in Madrid, Spain, June 17-22, 2018 (Scholarship amount: $1000).
- **SPE 2nd place** award for **Mid-Continent Regional Student Paper Contest**, 2019.
- **AADE 2nd place** Award for **National Technical Conference and Exhibition Student Paper Contest**, 2019 (Award amount: $1000).
- **SPE 1st place** award in **MPGE student paper contest** and selected to represent OU in SPE regional student paper contest (Award amount: $1000).
- **Outstanding reviewer** for **Journal of Natural Gas Science & Engineering**, 2018.
- **SPE 2nd place** Award received at the **19th Annual Gulf of Mexico Deepwater Technical Symposium University Student Paper Contest**, New Orleans, U.S.A, October 18-19, 2015(Award amount: $250).
- **SPE 1st place** Award received at the **18th Annual Gulf of Mexico Deepwater Technical Symposium University Student Paper Contest**, New Orleans, U.S.A, August 5-7, 2014 (Award amount: $500).
- **American Association of Drilling Engineers (AADE) Graduate Student Scholarship** for Spring, Summer, and Fall 2014 (Award amount: Tuition + Stipend). Awarded to the top two graduate students.
- Top 2.5% among engineering participants in India for IIT-JEE.
- **Certificate of Merit** for top 10% Scorers in **XXXIII National Mathematics Talent Competitions** in 2001.
- Fully funded High School Education from the Government of India.

Achievements and Recognitions

- **Guest editor** for the special issue "Drilling Technologies and Process Safety" of Sustainability (www.mdpi.com/journal/sustainability/special_issues/drilling_technologies_process_safety).
- Featured in **Drilling Contractor** Magazine, April 2018, The monthly magazine for the International Association of Drilling Contractors. https://www.drillingcontractor.org/hset-corner-ou-study-indicates-potential-for-real-time-eye-tracking-to-improve-drillers-situational-awareness-decision-making-46657
- Interview featured in Drilling Contractor Magazine, March 2018, The monthly magazine for the International Association of Drilling Contractors. https://www.drillingcontractor.org/eye-tracking-technology-shows-gaps-situational-awareness-decision-making-45960
- **SPE Petrobowl team mentor** for the University of Louisiana at Lafayette in 2015. Recruited the students, mentored, and trained them for the competition. The team placed 4th worldwide in 2015 international competition held in Houston, Texas.
- **University of Louisiana at Lafayette SPE Petrobowl team member**. Represented the university at the international Petrobowl competition held in Amsterdam, Netherland, on October 27, 2014. Assisted my team in qualifying for the quarter-finals for the first time in the history of the University's participation and placed 6th worldwide.

- **Phi Kappa Phi** Honor Society member, University of Louisiana at Lafayette, (2013-Present)
- Certified, IADC Well Control Fundamental course, December 2013.
- Successfully completed online course on Reservoir Geomechanics offered by Stanford University.
- Coursera Certified Data Science Professional.

List of Publications

Ph.D. Dissertation

Kiran, R., "Effect of Fluid Dynamics in Loss of Well Control Incidents in Subsea Wells," Doctoral Dissertation, Mewbourne School of Petroleum and Geological Engineering, University of Oklahoma, USA. May 2019. Link to Dissertation: https://shareok.org/handle/11244/319699

MS Thesis

Kiran, R., "Finite Element Analysis of Casing while Drilling's Smearing Effect," MS Thesis, Department of Petroleum Engineering, University of Louisiana at Lafayette, USA. December 2014. Link: https://search.proquest.com/openview/73a98f9c947043085716e694c19b780e/1?pq-origsite=gscholar&cbl=18750&diss=y

Refereed Journal Publications

J1. Upadhyay, R., Kumar, R., Kumar, A., Mobarsha, G., **Kiran, R.** and Rajak, V.K. 2026. Coalbed methane (CBM) well performance: A new methodology combining IPR and VLP analysis. *International Journal of Coal Science & Technology*, *13*(1), p.16. https://doi.org/10.1007/s40789-025-00844-8 ***Impact Factor: 8.7***

J2. Saif, M., Bathula, C.K., Upadhyay, R., **Kiran, R.** 2026. Mechanistic Investigation of CO2 Mineralization Potential in the Ultramafic Lithology of Deccan Traps. *Energy & Fuels*. 40(24), pp.12916-12933 https://doi.org/10.1021/acs.energyfuels.6c00030 ***Impact Factor: 6.0***

J3. Elgaddafi, R., Ahmed, R., **Kiran, R.** and Salehi, S., 2025. Modeling and Experimental Studies on High-Velocity Slug and Churn Gas-Liquid Upward Flows in Vertical Pipes. *Geoenergy Science and Engineering*, p.214210. https://doi.org/10.1016/j.geoen.2025.214210 ***Impact Factor: 4.4***

J4. **Kiran, R.,** Saif, M., Wood, D.A., Datta Gupta, S., Kumar, A., Upadhyay, R. and Rajak, V.K., 2025. Geological Hydrogen Prospectivity of Iron Ore Deposits in India Based on Semiquantitative Analysis. *ACS Omega*. 10(25), pp.27332-27347 https://doi.org/10.1021/acsomega.5c02770 ***Impact Factor: 4.3***

J5. Doley, A., Rajak, V.K., **Kiran, R.**, Mahto, V., Upadhyay, R., Eswaran, U. and Yadav, P., 2025. Enhancing the Shale Drilling Compatibility Using Hydroxyethyl Acrylate Chitosan. *Arabian Journal for Science and Engineering*, pp.1-15. https://doi.org/10.1007/s13369-025-10371-y ***Impact Factor: 2.9***

J6. **Kiran, R.**, Upadhyay, R., Rajak, V.K., Kumar, A., and Gupta, S.D. 2024. Underpinnings of reservoir and techno-economic analysis for Himalayan and Son-Narmada-Tapti geothermal sites of India. *Renewable Energy*, 237, p. 121630. https://doi.org/10.1016/j.renene.2024.121630 ***Impact Factor: 9.0.***

J7. **Kiran, R.**, Rajak, V.K., Upadhyay, R., and Kumar, A. 2024. Comparative techno-economic assessment of superhot rock and conventional geothermal energy feasibility for decarbonizing India. *Geothermics*, 122, p. 103078. https://doi.org/10.1016/j.geothermics.2024.103078 ***Impact Factor: 3.5***

J8. Saif, M., **Kiran, R.**, Rajak, V.K. and Verma, R.K., 2024. Investigation of an Indian Site with Mafic Rock for Carbon Sequestration. *ACS Omega*, 9(28), pp.30270-30280. https://doi.org/10.1021/acsomega.4c00213 ***Impact Factor: 3.7***

J9. Doley A., Mahto, V., Rajak V.K., **Kiran, R.** and Upadhyay, R. 2024. Investigation of Filtration and Shale Inhibition Characteristics of Chitosan-N-(2-hydroxyl)-propyl trimethylammonium Chloride as Drilling Fluid Additives. *ACS Omega*, 9(19), pp. 21365-21377.

https://doi.org/10.1021/acsomega.4c01632 ***Impact Factor: 3.7***

J10. Sekar, L.K., **Kiran, R.,** Okoroafor, E.R. and Wood, D.A., 2023. Review of reservoir challenges associated with subsurface hydrogen storage and recovery in depleted oil and gas reservoirs. *Journal of Energy Storage*, 72, p.108605. https://doi.org/10.1016/j.est.2023.108605 ***Impact Factor: 9.4***

J11. Raza MA, **Kiran R**, Ghazal S, Kang Z, Salehi S, Cokely E, Jeon J. An eye tracking based framework for safety improvement of offshore operations. *Journal of Eye Movement Research*. 2023 Aug 10;16(3):14. https://doi.org/10.16910/jemr.16.3.2 ***Impact Factor: 2.8***

J12. **Kiran, R.,** Upadhyay, R., Rajak, V.K., Gupta, S.D. and Pama, H., 2023. Comprehensive study of the underground hydrogen storage potential in the depleted offshore Tapti-gas field. *International Journal of Hydrogen Energy,* 48(33), pp.12396-12409. https://doi.org/10.1016/j.ijhydene.2022.12.172 ***Impact Factor: 7.139***

J13. Elgaddafi, R., Ahmed, R., **Kiran, R.**, Salehi, S. and Fajemidupe, O., 2022. Experimental and modeling studies of gas-liquid flow in vertical pipes at high superficial gas velocities. *Journal of Natural Gas Science and Engineering*, 106, p.104731. https://doi.org/10.1016/j.jngse.2022.104731 ***Impact Factor: 5.285***

J14. **Kiran, R.,** Dansena, P., Salehi, S. and Rajak, V.K., 2022. Application of machine learning and well log attributes in geothermal drilling. *Geothermics*, 101, p.102355. https://doi.org/10.1016/j.geothermics.2022.102355 ***Impact Factor: 4.566***

J15. Rajak, V.K., Gautam, S., Ajit, K.P., **Kiran, R.** and Madhumaya, A., 2022. Rheological Property Measurement and Application of Formate-Based Drilling Fluids at Elevated Temperatures: A Review. MAPAN, 37(3), pp.665-681. https://doi.org/10.1007/s12647-022-00546-5 ***Impact Factor: 1.446***

J16. Magzoub, M.I., **Kiran, R.**, Salehi, S., Hussein, I.A. and Nasser, M.S., 2021. Assessing the relation between mud components and rheology for loss circulation prevention using polymeric gels: A machine learning approach. Energies, 14(5), p.1377. https://doi.org/10.3390/en14051377. ***Impact Factor: 3.252.***

J17. **Kiran, R.**, Elgaddafi, R., Ahmed, R., Salehi, S., Griffith, C.A. and Fajemidupe, T., 2020. Wellbore fluid sonic conditions during blowouts. *Journal of Petroleum Science and Engineering*, 195, p. 107822. https://doi.org/10.1016/j.petrol.2020.107822

J18. **Kiran, R.**, Ahmed, R. and Salehi, S., 2020. Experiments and CFD modelling for two phase flow in a vertical annulus. *Chemical Engineering Research and Design*, 153, pp.201-211. https://doi.org/10.1016/j.cherd.2019.10.012

J19. Ezeakacha, C.P., Salehi, S., and **Kiran, R.**, 2018. Lost circulation and filter cake evolution: Impact of dynamic wellbore conditions and wellbore strengthening implications. *Journal of Petroleum Science and Engineering*, vol. 171, pp. 1326-1337. https://doi.org/10.1016/j.petrol.2018.08.063

J20. Salehi, S., **Kiran, R.**, Jeon, J., Kang, Z., Cokely, E.T., and Ybarra, V., 2018. Developing a cross-disciplinary, scenario-based training approach integrated with eye tracking data collection to enhance situational awareness in offshore oil and gas operations. *Journal of Loss Prevention in the Process Industries*, vol. 56, pp.78-94. https://doi.org/10.1016/j.jlp.2018.08.009

J21. **Kiran, R.**, Teodoriu, C., Dadmohammadi, Y., Nygaard, R., Wood, D., Mokhtari, M., and Salehi, S. (2017). Identification and evaluation of well integrity and causes of failure of well integrity barriers (A review). *Journal of Natural Gas Science and Engineering*, vol. 45, pp. 511-526. https://doi.org/10.1016/j.jngse.2017.05.009

J22. Salehi, S., Khattak, M.J., Rizvi, H., Karbalaei, S.F., and **Kiran, R.**, 2017. Sensitivity analysis of fly ash geopolymer cement slurries: Implications for oil and gas wells cementing applications. *Journal of Natural Gas Science and Engineering*, vol. 37, pp. 116-125. https://doi.org/10.1016/j.jngse.2016.11.025

J23. **Kiran, R.** and Salehi, S. 2017. Thermoporoelastic Modeling of Time-Dependent Wellbore Strengthening and Casing Smear. *ASME Journal of Energy Resources Technology*, vol. 139, no. 2, pp. 022903. https://doi.org/10.1115/1.4033591

J24. Salehi, S., Madani, S.A., and **Kiran, R.** 2016. Characterization of drilling fluids filtration through integrated laboratory experiments and CFD modeling. *Journal of Natural Gas Science and Engineering*, vol. 29, pp. 462-468. https://doi.org/10.1016/j.jngse.2016.01.017

J25. Salehi, S. and **Kiran, R.** 2016. Integrated experimental and analytical wellbore strengthening solutions by mud plastering effects. *ASME Journal of Energy Resources Technology*, vol. 138, no. 3, pp. 032904. https://doi.org/10.1115/1.4032236

Refereed Conference Publications

C1. Wu, Y., Salehi, S., **Kiran, R.** and Ghalambor, A., 2025, June. Investigation of Wellbore Flow and Transport Dynamics during Geological Hydrogen Production. In SPE Europe Energy Conference and Exhibition. OnePetro.

C2. Wartman, P., Ettehadi, A., **Kiran, R.,** Ostrander, C. and Mokhtari, M., 2024, September. Facilitating Carbon Capture and Storage in Louisiana: The Implications of Environmental Protection Agency's Final Rule Granting Primacy for Class VI Wells. In SPE Annual Technical Conference and Exhibition. (p. D011S003R005). SPE.

C3. Elgaddafi, R., **Kiran, R.**, Ahmed, R., Salehi, S., and Griffith, C. (2020, October 21). Development of a Computational Tool for Worst-Case Discharge Rate. SPE Annual Technical Conference. Virtual. https://doi.org/10.2118/201722-MS

C4. **Kiran, R.** and Salehi, S. (2020) Assessing the Relation between Petrophysical and Operational Parameters in Geothermal Wells: A Machine Learning Approach. In the Proceedings of 45th Workshop on Geothermal Reservoir Engineering. Stanford, CA.

C5. **Kiran, R.**, Naqavi, S. A., Salehi, S., and Teodoriu, C. (2019, September 23). Human Factors and Non-Technical Skills: Towards an Immersive Simulation-Based Training Framework for Offshore Drilling Operations. SPE Annual Technical Conference and Exhibition. Calgary, Alberta, CA. Paper no.: SPE-195838-MS. https://doi.org/10.2118/195838-MS

C6. Sinha, S., **Kiran, R.**, Tellez, J., and Marfurt, K. (2019, July 31). Identification and Quantification of Parasequences Using Expectation Maximization Filter: Defining Well Log Attributes for Reservoir Characterization. Unconventional Resources Technology Conference. Denver, CO, USA. Paper Number: URTec-2019-1023. https://doi.org/10.15530/urtec-2019-1023

C7. **Kiran R.**, Salehi, S., Mokhtari, M., and Kumar, A. (2019, June). Effect of Irregular shape and Wellbore Breakout on Fluid Dynamics and Wellbore Stability. 53rd US Rock Mechanics/ Geomechanics Symposium. New York City, NY, USA. Paper Number: ARMA-2019-2058.

C8. **Kiran, R.** and Salehi, S. (2018, September). Mathematical Modeling and Analysis of Riser Gas Unloading Problem. Proceedings of the ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering. Volume 8: Polar and Arctic Sciences and Technology; Petroleum Technology. Madrid, Spain. Paper Number: OMAE2018-77719. https://doi.org/10.1115/OMAE2018-77719

C9. **Kiran, R.**, Salehi, S., and Teodoriu, C. (2018, September). Implementing Human Factors in Oil and Gas Drilling and Completion Operations: Enhancing Culture of Process Safety. Proceedings of the ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering. Volume 8: Polar and Arctic Sciences and Technology; Petroleum Technology. Madrid, Spain. Paper Number: OMAE2018-78431. https://doi.org/10.1115/OMAE2018-78431

C10. Ezeakacha, C. P., Salehi, S., and **Kiran, R**. (2018, September). Quantification of Multiple Factors and Interaction Effects on Drilling Fluid Invasion. Proceedings of the ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering. Volume 8: Polar and Arctic Sciences and Technology; Petroleum Technology. Madrid, Spain. Paper Number: OMAE2018-78328. https://doi.org/10.1115/OMAE2018-78328

C11. **Kiran, R.**, Salehi, S., Hayatdavoudi, A., and Ezeakacha, C. P. (2018, August). Wellbore Strengthening Characteristics Evaluation of Sandstones Using Experimental and Analytical Studies. 52nd U.S. Rock Mechanics/Geomechanics Symposium. Seattle, WA, USA. Paper Number: ARMA-2018-1129.

C12. Ezeakacha, C. P., Salehi, S., and **Kiran, R**. (2018, August). Pore-Scale Mud Invasion in Different Rock Samples and Wellbore Conditions: Implications for Lithology Dependent Wellbore Strengthening. 52nd U.S. Rock Mechanics/Geomechanics Symposium. Seattle, WA, USA. Paper Number: ARMA-2018-544.

C13. Kang, Z., Jeon, J., **Kiran, R.**, Salehi, S., Ybarra, V.T., and Cokely, E. (2018, May). Situation awareness assessment using eye movements and verbal response scoring metrics. In Proceedings of the 2018 IISE Annual Conference. Orlando, FL, USA. Paper Number: 2506.

C14. Salehi, S., **Kiran, R.**, Jeon, J., Kang, Z., Teodoriu, C., and Cokely, E. (2018, April). Enhancing Situation Awareness and Process Safety in Offshore Drilling Operations: Applications of Eye-Tracking System. Offshore Technology Conference. Houston, TX, USA. Paper Number: OTC-28849-MS. https://doi.org/10.4043/28849-MS

C15. **Kiran, R.**, Salehi, S., Jeon, J., and Kang, Z. (2018, March). Real-Time Eye-Tracking System to Evaluate and Enhance Situation Awareness and Process Safety in Drilling Operations. IADC/SPE Drilling Conference and Exhibition. Fort Worth, TX, USA, Paper Number: SPE-189678-MS. https://doi.org/10.2118/189678-MS

C16. Dadmohammadi, Y., Salehi, S., **Kiran, R.**, Jeon, J., Kang, Z., Cokely, E.T., and Ybarra, V. (2017, October). Integrating Human Factors into Petroleum Engineering's Curriculum: Essential Training for Students. SPE Annual Technical Conference and Exhibition. San Antonio, TX, USA. Paper Number: SPE-187241-MS. https://doi.org/10.2118/187241-MS

C17. **Kiran, R.,** Salehi, S., and Karimi, M. (2014, September). Finite Element Analysis of Casing Drilling Smearing Effect, SPE Deepwater Drilling and Completions Conference. Galveston, TX, USA. Paper Number: SPE 170314. https://doi.org/10.2118/170314-MS

Conference Presentations

CP1. **Kiran, R.** (2020, November). Worst Case Discharge (WCD) computational tool in Sonic and Supersonic. Presented at 24th Annual GoM Deepwater Technical Symposium, Virtual.

CP2. **Kiran, R.** (2019, April). Worst Case Discharge Estimation Based on Experimental and Numerical Investigation. AADE National Technical Conference and Exhibition University Student Paper and Poster Presentation. Denver, CO, USA.

CP3. **Kiran, R.** (2019, April). Worst Case Discharge Estimation Based on Experimental and Numerical Investigation of High-velocity Multi-phase Flow Characterization. SPE Mid-continent Regional Student Paper Presentation. Oklahoma City, OK, USA.

CP4. **Kiran, R.** and Salehi, S. (2017, September). Situation Awareness Assessment in Well Control Training using Eye Tracking Data and Scenario Planning. IADC Human Factors Conference & Exhibition. Galveston, TX, USA.

CP5. **Kiran, R.** and Salehi, S. (2017, April). Thermo-Poro-Elastic Modeling of Time-Dependent Wellbore Strengthening and Casing Smear. AADE National Technical Conference and Exhibition, Houston, TX, USA.

CP6. **Kiran, R.**, Salehi, S., and Karimi, M. 2014. Unravelling Casing Drilling Smearing: Finite Element Analysis. AADE National Technical Conference and Exhibition, Houston, TX, USA.

CP7. **Kiran, R.** and Salehi, S. 2015. Integrated Experimental, Numerical, and Analytical Investigation of Wellbore Strengthening and Casing Smear. Presented at 19th Annual GoM Deepwater Technical Symposium, New Orleans

CP8. **Kiran, R.** and Salehi, S. 2014. Numerical Investigation of Casing while Drilling Technology: Understanding Mechanisms. Presented at 18th Annual GoM Deepwater Technical Symposium, New Orleans

Invited Talks

CP1. **Kiran, R.** 2020. Cognitive engineering and its societal impacts of Deepwater horizon incident. International Webinar on Social Cost Benefit Analysis of Projects under the aegis of UGC-UKIERI Joint Research Program.

CP2. Salehi, S. Ahmed, R., Elgaddafi, R., Fajemidupe, O., and **Kiran R.** 2019. Project Overview - Research and Development on Critical (Sonic) Flow of Multiphase Fluids through Wellbores in Support of Worst-Case-Discharge Analysis for Offshore Wells. Technical Meeting of BOEM. New Orleans, LA, USA.

CP3. **Kiran, R.** 2015 Finite Element Analysis and Technological Benefits of Casing while Drilling. General Meeting AADE Lafayette Chapter. Lafayette, LA, USA.

Technical Reports

T1. Salehi, S. Ahmed, R., Elgaddafi, R., Fajemidupe, O., and **Kiran R.** 2019. WCD Computational Tool - Research and Development on Critical (Sonic) Flow of Multiphase Fluids through Wellbores in Support of Worst-Case-Discharge Analysis for Offshore Wells, BOEM Report Prepared under Contract Award M16PS00059, Mewbourne School of Petroleum and Geological Engineering, University of Oklahoma, Norman, OK. https://www.boem.gov/University-of-Oklahoma-Final-Report-WCD-Computational-Tool-10-2/

T2. Salehi, S. Ahmed, R., Elgaddafi, R., Fajemidupe, O., and **Kiran R.** 2019. Experimental Report - Research and Development on Critical (Sonic) Flow of Multiphase Fluids through Wellbores in Support of Worst-Case-Discharge Analysis for Offshore Wells, BOEM Report Prepared under Contract Award M16PS00059, Mewbourne School of Petroleum and Geological Engineering, University of Oklahoma, Norman, OK. https://www.boem.gov/Experimental-Report/

T3. Salehi, S. Ahmed, R., Elgaddafi, R., and **Kiran R.** 2019. CFD Modeling Report - Research and Development on Critical (Sonic) Flow of Multiphase Fluids through Wellbores in Support of Worst-Case-Discharge Analysis for Offshore Wells, BOEM Report Prepared under Contract Award M16PS00059, Mewbourne School of Petroleum and Geological Engineering, University of Oklahoma, Norman, OK. https://www.boem.gov/CFD-Modeling-Report/

T4. Salehi, S. Ahmed, R., Elgaddafi, R., and **Kiran R.** 2019. WCD Literature Review - Research and Development on Critical (Sonic) Flow of Multiphase Fluids through Wellbores in Support of Worst-Case-Discharge Analysis for Offshore Wells, BOEM Report Prepared under Contract Award M16PS00059, Mewbourne School of Petroleum and Geological Engineering, University of Oklahoma, Norman, OK. https://www.boem.gov/WCD-Literature-Review/

Professional Activities

Professional Affiliations

1. Member, Society of Petroleum Engineers, since 2013.
2. Member, American Association of Drilling Engineers, since 2013.
3. Member, Society of Petrophysicists and Well Log Analysts, since 2016.
4. Member, Phi Kappa Phi, since 2013.

Professional Duties

1. Guest Editor, Scientific Reports, Special Collection, 2026.
2. Editorial Board Member, Scientific Reviews, Springer Nature, since 2026.
3. Editorial Board Member, Scientific Reports, Springer Nature, since 2025.
4. Technical Reviewer, ACS, since 2020.
5. Guest Editor, Sustainability, since 2019.
6. Technical Reviewer, Journal of Petroleum Exploration and Production Technology, since 2018.
7. Technical reviewer, SPE Drilling and Completion Journal, since 2017.
8. Technical reviewer, OMAE, since 2017.
9. Technical Reviewer, Geoenergy Science and Engineering, since 2016.
10. Technical Reviewer, Journal of Engineering Resources and Technology, since 2016.
11. Technical Reviewer, Gas Science and Engineering, since 2016.
12. Technical Reviewer, Journal of Greenhouse Gas Control, since 2020.

Leadership

1. Mentor and Judge for Switch International Energy Competition, 2024-Present.
2. Webmaster, SPE Human Factor Technical Section, 2020-present. (https://connect.spe.org/hfts/aboutus/sectionofficers)
   - Activities: Working with section officers to improve the engagement with the public.
3. Co-chair, OMAE Human Factor Session, June 2018
   - Activities: Reviewed the papers submitted for human factors session, coordinated the Petroleum Technology session at ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering, Madrid, Spain.
4. Finance Manager, SPE Oklahoma City Drilling Study Group, 2017-18.

- Activities: Assisted the program coordinator to arrange seminars on different research topics from industry, designed social media activities to showcase the activities, and managed the financial activity.

Skills

Programming Languages: C, C++, Python, SQL, Matlab.
Software Packages: ANSYS, ABAQUS, COMSOL 5.2, Optimizer, Schlumberger Eclipse (E100 & E300), Petrel RE, CMG, Floviz, PVTi, VFPi, Maple, Fekete, MS Office, R, SAS, Solidworks, Prosper, PIPESIM, SAP, MathCAD, AUTOCAD.