

Nima Daneshvarnejad Ph.D. Petroleum Engineering

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Summary

Ph.D. with experience in oil and gas risk assessment, management, and energy business model creation. Hands-on expertise in methane emission monitoring, IoT sensor deployment, and computational fluid dynamics modeling for plugged and abandoned wells. Skilled in carbon credit markets, including both voluntary and cap-and-trade frameworks. Experienced in AI-driven time series prediction modeling using Closed-form Continuous-time (CfC) and Liquid Time-Constant (LTC) networks. Seeking to enhance methane emission inventory accuracy, build legacy asset management models, and deliver AI-based solutions for oil and gas legacy assets across the U.S.

Focus Area

Risk assessment, Energy assets life cycle analysis, Emission Monitoring, Physically-Constrained Modeling, Computational Fluid Dynamic Modeling, Well and Legacy Assets Integrity, Airborne Emission Imaging, Machine Learning, Time Series Prediction.

Education

University of Southern California, Los Angeles, CA April 2026
Ph.D. Petroleum Engineering (Chevron Fellowship)

Research Focus: AI-driven methane emission monitoring and reservoir simulations

University of Southern California, Los Angeles, CA May 2022
M.S. Petroleum Engineering

Sharif University of Technology June 2018
B.S. Petroleum Engineering

Industry Experience

- Developing CO₂ Emission Measuring Methods for Berry Corporation Steam Generators and Co-generation Plants.
- Optimized steam and chemical flood processes for Cymric and Midway-Sunset heavy oil fields, enhancing recovery efficiency by 10% (in collaboration with Chevron).
- Consulting [RMI](#) in orphaned and abandoned wells explainer for voluntary carbon credit markets.
- Consulted for University of Chicago Energy Policy Institute in Democratic Republic of Congo to set up Air Quality Monitoring Infrastructure and Built Predictive Models (Awarded by the University of Chicago Energy Policy Institute).

Publications

- **MDPI Environments 2026 (under revision)**
A New Method for Monitoring System for Methane Detection from Plugged and Unplugged Abandoned Wells Using Smart Static Canopies.
DOI: [10.20944/preprints202606.0009.v1](#) 2026 [View Paper](#)
- **SPE Western Regional Meeting**
AI-Driven Computational Fluid Dynamic Simulations and Experiments to Predict Methane Emission: Applications to Idle and Abandoned Wells (in collaboration with Beyond Limits).
SPE-224153-MS 2025 [View Paper](#)
- **SPE Canadian Energy Technology Conference**
A Method for Detection of Methane Leaks from Idle and Orphaned Wells Using High-Precision Sensor and a Ventilation Canopy (in collaboration with Beyond Limits).
SPE-218022-MS 2024 [View Paper](#)
- **SPE Western Regional Meeting**
Monitoring Low and Intermittent Methane Emission from Orphaned and Idle wells (in collaboration with Beyond Limits).
SPE-218839-MS 2024 [View Paper](#)
- **SPE Western Regional Meeting**
The Integrity of Idle and Abandoned Wells in California.
SPE-218887-MS 2024 [View Paper](#)

Presentations

- **4th AAPG Orphan, Abandoned, Idle, and Marginal Wells Conference** *From Leak Rate to Leak Profile: AI-Driven Monitoring and Predictive Modeling of Methane Emissions from Orphaned and Abandoned Wells* Presenter 2026
- **2nd Annual Orphan, Idle and Marginal Wells California Conference** *Using Carbon Markets to Scale Monitoring and Remediation of Legacy Wells in California* Presenter and Panelist 2026
- **San Joaquin Well Logging Society** *Errors in Emission Measurement from Idle and Orphaned Wells* Presenter 2025

- **3rd AAPG Orphan, Abandoned, Idle, and Marginal Wells Conference** *Abandoned Wells Methane Emission Monitoring Solutions Presenter* 2025 *Working with State and Federal Agencies Panelist* 2025

Technical Skills

Computational Modeling: COMSOL Multiphysics (CFD), MATLAB, Latin Hypercube Sampling, Multiphase Flow Simulation

ML/AI: Python, Liquid Time Constant Networks, Agent Base Modeling, Keras, GRU Networks, Fourier Neural Operators, Time Series Forecasting, Image Recognition

Data & Tools: Git, LaTeX, IoT Sensor Integration, Inverse Dispersion Modeling Using Satellite Emission Data Processing

Research Projects

Ph.D. Thesis: “Monitoring and Detection of Methane Leaks From Plugged and Abandoned Wells Using MPS Sensors and Ventilation Canopies”

- Developing Liquid Time Constant and Fourier Neural Operators Machine Learning Algorithms for Time Series Prediction.
- Methane Emission Monitoring Design Enhancement by Machine Learning Assisted Multiphase Computational Fluid Dynamic Simulation (in collaboration with Beyond Limits).
- Locating Historical Wells and Regulatory Documents Analysis.
- Methane Emission Satellite Data Modeling Using Machine Learning.

Honors & Awards

- *Chevron Master level scholarship* 2020-2022
- *USC Viterbi fellowship* 2022
- *ECET fellowship* 2023
- *SPE LA Basin Section Fellowship* 2023
- *SPE LA Basin Section Fellowship* 2024
- *SPE LA Basin Section Fellowship* 2025
- *SPE NA region best Ph.D. student paper award* 2026
- *Daneshy Award recipient* 2026

Leadership

- **USC - SPE Student Chapter President** 2021-2022
Collaborated with energy scholars, managed SPE events and talks in addition to monthly newsletter and field trips.
- **USC - SPE Student Chapter Vice President** 2022-2024
Managed USC SPE student chapter relation with SPE LA basin section.
- **SPE LA basin section young professionals program officer** 2022-2024
Organized events with younger generation of industry professionals.
- **Persian Academic and Cultural Student Association** 2021-2024
Promoted Persian art and culture through the USC Persian Community.

Professional Societies Membership

- **Society of Petroleum Engineers (SPE)**
Member since 2013.
- **American Geophysical Union (AGU)**
Member since 2023.
- **American Association of Petroleum Geologists (AAPG)**
Member since 2025.

References

- **Dr. Iraj Ershaghi (USC)**
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- **Dr. Donald Paul (USC)**
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- **Dr. Rajiv Kalia (USC)**
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