

# Muhammad Haseeb Mukhtar

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## EDUCATION

### University of Houston

PhD Candidate – Petroleum Engineering

Advisor: Dr. Christine Ehlig-Economides

Houston, USA

Aug 2021 – Expected Apr 2027

### NED University of Engineering and Technology

Bachelor of Engineering – Petroleum Engineering

Karachi, Pakistan

Feb 2017

## SUMMARY

Petroleum engineering PhD candidate who started in the field, with 3.5+ years as an on-site production engineer managing workovers, stimulation, artificial lift design/optimization, and well testing. Research spans CO<sub>2</sub> utilization, sequestration, and waterflooding design, including detailed field studies in the Permian Basin and offshore NW Australia. Currently developing a wastewater disposal optimization tool to prevent leakage events, building on a self-designed machine learning framework that identifies and characterizes leaking legacy wellbores. Interested in building data-driven systems and technologies that rethink and streamline established operational workflows.

## PROFESSIONAL EXPERIENCE

### Hilcorp Energy

Houston, USA

*Co-Op Student – Operations, East Texas Asset*

May 2025 – Sept 2026

- Identified, designed, and pitched production restoration projects; returned a dead well to ~1 MMscf/d of gas production.
- Analyzed the complete life of 200+ wells and built and maintained accurate, chronological wellbore schematics in WellView for the East Texas Asset.

### Gulf Coast Carbon Center, Bureau of Economic Geology

Austin, USA

*Research Intern*

May 2024 – Aug 2024

- Analyzed the leakage profile of a nearby legacy wellbore under CO<sub>2</sub> injection.
- Built a coupled wellbore–reservoir model in T2Well-ECO2N and ran multiple leakage scenario simulations.

### SLB – CapturePoint – University of Houston Externship

Houston, USA

*Reservoir Engineer – Extern*

May 2023 – Aug 2023

- Built a geological model of CapturePoint's Denver City Field (George Allen Unit / Ruth Hudson Unit).
- History-matched an Eclipse (E300) compositional model across primary, secondary, and tertiary recovery.
- Designed and analyzed WAG cycles to optimize recovery.
- Performed dimensionless forecasting and economic analysis.
- Presented findings at the SPE Improved Oil Recovery Conference 2024, Tulsa, OK.

### SEG EVOLVE Carbon Solutions Program

Houston, USA

*Engineer – Intern*

Aug 2022 – Feb 2023

Evaluated CO<sub>2</sub> storage potential in the depleted Wanaea and Cossack fields, NW Australia.

- Collaborated with a team of 8 engineers and geoscientists and industry/academic mentors, integrating technical and commercial data for project decisions.
- Developed CO<sub>2</sub> source, capture, and transportation designs and assessed their business viability.
- Supported reservoir simulation and monitoring plan design.
- Presented findings at the CCUS Conference 2023, Houston, TX.

### Oil and Gas Development Company Limited

Islamabad, Pakistan

*Production Engineer – Qadirpur Gas Field*

Oct 2017 – May 2021

- Managed day-to-day on-site production operations at Qadirpur, one of Pakistan's largest gas fields.
- Diagnosed underperforming wells; designed and pitched artificial lift solutions to restore deliverability.
- Planned and supervised workovers, stimulation, interventions, surveys, and well tests from design through execution.
- Implemented HSE protocols and led safety drills and training for field crews.
- Coordinated with drilling, maintenance, and service company teams to resolve operational issues and minimize downtime.

## RESEARCH AND PROJECTS

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### **Categorizing Legacy Wellbores in the Delaware Basin Based on Failure Risks Under Wastewater Injection – SPE ATCE 2025, Houston TX**

- Developed a machine learning framework that classifies legacy wellbores by failure risk to identify leaking wells (patent pending).
- Geospatially integrated surface deformation, wellbore construction (depth and age), and produced/injected volumes to assign a risk score to every well in the county.
- Flagged ~15% of wellbores in Reeves County, TX as requiring immediate remediation; work featured in the Houston Chronicle and Houston Public Media radio.
- Led to an Interagency Cooperation Contract between UH and the Railroad Commission of Texas.

### **Identifying Leaking Legacy Wellbores Using Satellite Imagery Analysis (SIA) Under Wastewater Disposal**

- Developed a technique using optical and SAR satellite imagery to identify leaking wellbores at county scale.
- Integrated a machine learning model on current and historical imagery to pinpoint leak location and timing, building a spatiotemporal leakage dataset.
- Patent filing planned upon proof-of-concept.

### **Evaluation of Future CO<sub>2</sub> Injection in Denver City Field for EOR and CCUS – SPE IOR Conference 2024, Tulsa OK**

- Built a geological and history-matched flow model to evaluate recovery from the main oil column (MOC) and residual oil zone (ROZ).
- Forecast EOR options ranging from low-capital injection increases in existing patterns to expansion drilling into new pattern areas.
- Delivered realistic renewed CO<sub>2</sub> injection strategies to current field operators.

### **Extended Aquifer System Pressure Behavior Under Carbon Storage – SPE ATCE 2023, San Antonio TX and SPE Journal 2024**

- Reviewed successful and unsuccessful open saline aquifer CO<sub>2</sub> storage projects worldwide.
- Defined key fundamentals for selecting storage aquifers.
- Analyzed unexpected lateral plume migration and aquifer pressure buildup during CO<sub>2</sub> injection.
- Assessed conditions for long-term, safe, and permanent storage during and after injection.

### **Evaluation of CO<sub>2</sub> Storage Potential in Depleted Hydrocarbon Fields: A Case Study of Cossack and Wanaea Fields, NW Australia – CCUS Conference 2023, Houston TX**

- Multidisciplinary appraisal of depleted Carnarvon Basin fields by a team of 8 engineers and geoscientists (SEG EVOLVE 2022–23).
- Integrated geological, geophysical, engineering, regulatory, and infrastructure data to assess CCS project economics.
- Achieved an estimated storage cost of USD 42.73/tCO<sub>2</sub>.

## SKILLS

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**Software:** ArcGIS, Petrel, Eclipse, CMG (IMEX, GEM), T2Well, Petra, Harmony, WellView, Techlog, MATLAB, PVTsim, Python (machine learning, artificial neural networks).

**Languages:** English (Fluent)

**Teamwork:**

- Lead a research group with faculty from 4 different schools.
- Collaborate with Chemical Engineering, Civil Engineering, and Geoscience departments on 3 projects.

## AWARDS AND ACHIEVEMENTS

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|-----------------------------------------------------------------------------------------|--------------|
| • TexE Fellow – Cohort 2026                                                             | 2025–2026    |
| • UH PetroBowl Team – Regional Qualifier Winner & 4 <sup>th</sup> in World Championship | 2025–2026    |
| • Media: Houston Chronicle profile; Houston Public Media radio interview                | 2026         |
| • Published in peer-reviewed SPE Journal                                                | 2024         |
| • Elected Senator – Student Government Association, University of Houston               | 2024–2025    |
| • Presenting author at numerous petroleum conferences and workshops                     | 2023–Present |
| • Vice President – SPWLA UH Student Chapter                                             | 2023–2024    |
| • Active reviewer for multiple peer-reviewed journals                                   | 2023–2026    |