Emre Artun, Ph.D.

Associate Professor of Petroleum and Natural Gas Engineering
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Research Interests

Data analytics and machine learning applications, reservoir engineering and management, subsurface gas/energy storage, geothermal energy

Academic Degrees

Penn State University, University Park, Pennsylvania, USA

Ph.D., Petroleum and Natural Gas Engineering, 2008.

Minor, Computational Science, 2008.

West Virginia University, Morgantown, West Virginia, USA

M.S., Petroleum and Natural Gas Engineering, 2005.

Middle East Technical University, Ankara, Turkey

B.Sc., Petroleum and Natural Gas Engineering *(Honors)*, 2003.

Professional Experience

Sultan Qaboos University, Muscat, Oman

Associate Professor, Petroleum and Natural Gas Eng. (09/2023 – present)

Istanbul Technical University, Istanbul, Turkey

Associate Department Head (Education), Petroleum and Natural Gas Eng. (03/2021 – 09/2023)

Accreditation Coordinator, Petroleum and Natural Gas Eng. (09/2020 – 09/2023)

Associate Professor, Petroleum and Natural Gas Eng. (08/2020 – 09/2023)

Middle East Technical University, Northern Cyprus, Güzelyurt, Northern Cyprus

Associate Professor, Petroleum and Natural Gas Eng. (10/2017 – 02/2020)

Program Chair, Petroleum and Natural Gas Eng. (08/2017 – 02/2020)

Assistant Professor, Petroleum and Natural Gas Eng. (09/2012 – 10/2017)

Quantum Reservoir Impact (QRI), Houston, Texas, USA / Ahmadi, Kuwait

Analyst, Reservoir Engineering (04/2011 – 09/2012)

Chevron Energy Technology Company, Houston, Texas, USA

Reservoir Simulation Engineer (05/2007 – 07/2007 and 10/2008 – 04/2011)

Professional Memberships

- Turkish Chamber of Petroleum Engineers (2020 – present)
- Society of Petroleum Engineers (2001 – present)

Consultancy

- Quantum Reservoir Impact (QRI), Ahmadi, Kuwait (07/2013 – 09/2013).
- Miller Energy Technologies, Lexington, Kentucky, USA (07/2007 – 08/2007)

Honors and Awards

- **2024** Best Paper Award - 4th Annual Meeting of Mediterranean Geosciences Union (MedGU)
- **2021** Istanbul Tech. Univ. - Publication Award (Top 10% annual performance in the department)
- **2013-2016** SPE Faculty Enhancement Travel Grant (4 times)
- **2013** Certificate of Excellence in Reviewing, J. of Natural Gas Science and Engineering
- **2009** Chevron Winning Together Award
- **2008** Penn State Petroleum and Natural Gas Engineering Graduate Merit Award
- **2008** 2nd place at the Penn State Annual Graduate Exhibition - Engineering Poster Competition
- **2005** Best Student Paper Award at the AAPG Eastern Section Meeting

Research Grants

1. Principal investigator: Feasibility and Risk Assessment of CO_2 Storage via Mineral Carbonation in Peridotites in Oman. Funded by Sultan Qaboos University - Internal Grant. Duration: 01/2025-01/2027 (2 years).
2. Principal investigator: Data-Analytics Assisted Investigation of Carbon-Dioxide Sequestration in Depleted Shale Gas Reservoirs. Funded by Sultan Qaboos University - Deanship of Research Fund. RF/ENG/PCED/24/01. Duration: 01/2024-01/2025 (12 months).
3. Principal investigator: An Investigation of Machine Learning Applications for Reservoir Characterization, Performance Forecasting and Field Development Planning. Funded by Turkish Petroleum Corporation via ITUNOVA Technology Transfer Office. Duration: 08/2022-06/2023 (10 months).
4. Principal investigator: Selecting Candidate Wells for Extended Shut-in Periods Using Unsupervised Machine Learning Algorithms. ITU Research Fund. MGA-2021-42991. Duration: 08/2021-08/2023 (2 years).
5. Principal investigator: Development of a Screening Tool to Assess the Feasibility of Solar-to-Steam Application for the Purpose of Enhanced Oil Recovery. METU Northern Cyprus Campus - KALTEV Research Fund. KALTEV-17-003. Duration: 12/2017-10/2020 (34 months).
6. Principal investigator: Estimation of Carbon Footprint: A Case Study for Middle East Technical University Northern Cyprus Campus. METU Northern Cyprus Campus - Campus Research Fund. Project No. FEN-16-D-2. Duration: 04/2016-01/2018 (21 months).
7. Principal investigator: Optimization of Waterflooding in Mature Oil Reservoirs Using Computationally-Efficient Analytical Tools. METU Northern Cyprus Campus - Campus Research Fund. Project No. FEN-13-YG-2. Duration: 04/2013-04/2015 (2 years).

Recent Publications and Presentations

1. Mansour, A., Al-Maamari, R., Souayeh, M., Artun, E., Al-Riyami, O. (2025). Experimental investigation and modeling of water alternating polymer flooding in homogeneous sandstone reservoirs. *Geoenergy Science and Engineering*, **247**:213725. doi:10.1016/j.geoen.2025.213725
2. Artun, E., Canbolat, S., Yildirim, E.C., Acikgoz, C., Yuruker, O. (2025). An integrated workflow for data analytics assisted reservoir management with incomplete well-log data. *SPE Journal*, **30**(2):486-506. doi:10.2118/223633-PA
3. Al-Ghafri, A.H.†, Al Senani, A., Al-Salmi, H.†, Al-Mamari, S.†, Artun, E. (2025). An unsupervised learning framework for managing ESP-driven oil field operations with water injection in Northern Oman. SPE Conference at the Oman Petroleum & Energy Show. 12-14 May. doi:10.2118/225013-MS

4. Al-Ghafri, A.H.†, Al-Maamari, R., Artun, E. (2025). Investigation of naturally fractured carbonate reservoir development in Northern Oman through dynamic modelling. SPE Conference at the Oman Petroleum & Energy Show. 12-14 May. doi:10.2118/225097-MS

5. Artun, E., Al-Amri, A.† (2025). Time-to-event analysis of shale well performance for identification of key performance drivers. SPE EuropEC - Europe Energy Conference. 10-12 June. Vienna, Austria. doi:10.2118/225535-MS

6. Canbolat, S., Cicek, M., Artun, E. (2025). Data-driven reservoir performance forecasting: leveraging machine learning for complex reservoirs. SPE EuropEC - Europe Energy Conference. 10-12 June. Vienna, Austria.

7. Gunel, T.†, Pak, Y.†, Herekeli, O.†, Gul, S., Kulga, B., Artun, E. (2025). Machine learning-based estimation of solids content in drilling fluids through utilization of a comprehensive mud-report database. SPE EuropEC - Europe Energy Conference. 10-12 June. Vienna, Austria. doi:10.2118/225536-MS

8. Lobut, B.†, Artun, E. (2024). Enhancing economic sustainability in mature oil fields: insights from the clustering approach to select candidate wells for extended shut-in. *Artificial Intelligence in Geosciences*, **5**:100082. doi:10.1016/j.aiig.2024.100082R

9. Al-Yaqoubi, H.†, Al-Mamari, S.†, Lobut, B.†, Artun, E. (2024) Integrating unsupervised learning and fuzzy inference systems for well classification and shut-in decision making in the oil and gas industry. 2nd GCC International Conference on Industrial Engineering and Operations Management. 1-3 December. Muscat, Oman.

10. Artun, E., Guful, P. †, Aliyev, K. †, Kulga, B., Al-Amri, A.† (2024)# Sustainability of CO_2 sequestration in shale gas reservoirs: an investigation of economic and environmental aspects through numerical and data-driven models. The 4th Annual Meeting of Mediterranean Geosciences Union. 25-28 November. Barcelona, Spain.

11. Onder, A. †, Ak, A.C., Kulga, B., Artun, E. (2024)# Machine learning assisted forecasting of geothermal production with or without CO2 reinjection. The 4th Annual Meeting of Mediterranean Geosciences Union. 25-28 November. Barcelona, Spain.

12. Aliyev, K. †, Artun, E., Kulga, B. (2023)#. Evaluation of sustainability aspects of CO_2 sequestration in depleted shale reservoirs using data analytics. IPETGAS Conference and Exhibition. 27-29 September. Ankara, Turkey.

13. Artun, E., Canbolat, S., Yildirim, E.C., Acikgoz, C., Yuruker, O. (2023)#. Machine learning assisted forecasting of field performance: a case study. IPETGAS Conference and Exhibition. 27-29 September. Ankara, Turkey.

14. Artun, E., Canbolat, S., Yildirim, E.C., Acikgoz, C., Yuruker, O. (2023)#. Estimation of missing well-log sections using machine learning assisted multivariate imputation: a case study. IPETGAS Conference and Exhibition. 27-29 September. Ankara, Turkey.

15. Lobut, B. †, Artun, E. (2023)*. Machine-learning based selection of candidate wells for extended shut-in due to fluctuating oil prices. SPE EuropEC - Europe Energy Conference. 5-8 June. Vienna, Austria.

16. Shedaiwa, M. †, Artun, E. (2023). Forecasting the performance of shale gas wells using machine learning. ITU 2nd International Graduate Research Symposium (IGRS). 16-18 May.

17. Baabbad, H.K.H. †, Artun, E., Kulga, B. (2022)*. Understanding the controlling factors for CO_2 sequestration in depleted shale reservoirs using data analytics and machine learning. SPE EuropEC - Europe Energy Conference. 6-9 June. Madrid, Spain.

18. Artun, E. (2022). Machine Learning Assisted Forecasting of Reservoir Performance. In *Machine Learning Applications in Subsurface Energy Resource Management: State of the Art and Future Prognosis*, S. Mishra, Ed., CRC Press, Boca Raton, Florida, USA. doi:10.1201/9781003207009

19. Canbolat, S., Artun, E. (2022). Machine-learning approach for forecasting steam-assisted gravity-drainage performance in the presence of noncondensable gases. *ACS Omega*, **7**(24):21119–21130. doi:10.1021/acsomega.2c01939

20. Baabbad, H.K.H.†, Artun, E., Kulga, B. (2022). Understanding the controlling factors for CO_2 sequestration in depleted shale reservoirs using data analytics and machine learning. *ACS Omega*, **7**(24):20845–20859. doi:10.1021/acsomega.2c01445

21. Zarepakzad, N.†, Artun, E., Durgut, I. (2021). A comparative analysis and rapid performance prediction of polymer flooding process by coupling reservoir simulation with neural networks. *International Journal of Oil, Gas and Coal Technology*. **27**(3):227-246. doi:10.1504/ijogct.2021.115801

22. Turan, A.†, Artun, E., Saner, S. (2021). Probabilistic assessment of geothermal resources and their development in Dikili-Izmir region. *SN Applied Sciences*, **3**(6):1-13. doi:10.1007/s42452-021-04603-7

23. Mugisha, J.†, Al-Rbeawi, S., Artun, E. (2021). Analytical modeling of flow regimes during cyclic CO_2 injection in hydraulically fractured tight reservoirs for enhanced oil recovery. *Journal of Petroleum Science and Engineering*, **201**:108385. doi:10.1016/j.petrol.2021.108385

24. Artun, E. (2021). Assessment of carbon footprint of a campus with sustainability initiatives. *Gazi University Journal of Science*, **34**(3):652-663. doi:10.35378/gujs.726553

25. Artun, E. (2021). Machine-learning based modeling of hydrocarbon reservoirs. *Invited talk* at TUBA World Conference on Energy Science and Technology, 8-12 August, virtual.

26. Celik, D.†, Bolat, F.†, Guler, M.I.†, Artun, E. (2021). Designing carbon sequestration in a depleted oil reservoir considering sustainability aspects. 4th Graduate Student Conference on Energy and Sustainable Development (GCESD 2021), 8-October, virtual.

27. Turan, A.†, Artun, E., Saner, S. (2021)*. Resource assessment of Kozak Granodiorite for an EGS application in Dikili-Izmir Region, Western Turkey. World Geothermal Congress. Paper no. 31012, March-October, virtual.

28. Seilkhanov, A.†, Otynshin, D.†, Novopokrovskiy, G., Artun, E. (2020) Comparison of machine learning algorithms for the development of a forecasting tool for cyclic gas injection in hydraulically-fractured wells. SPE Annual Caspian Technical Conference, Virtual, October. doi:0.2118/202507-MS

29. Artun, E. (2020). Machine learning applications in reservoir engineering: past, present and future. *Invited talk* at SPE Turkey Section Seminar Series, 20 February, Ankara, Turkey.

30. Artun, E. (2020). Performance assessment and forecasting of cyclic gas injection into a hydraulically fractured well using data analytics and machine learning. *Journal of Petroleum Science and Engineering*, **195**:107768. doi:10.1016/j.petrol.2020.107768

31. Artun, E., Kulga, B. (2020). Selection of candidate wells for re-fracturing in tight gas sand reservoirs using fuzzy inference. *Petroleum Exploration and Development*, **47**(2):225-232. doi:10.1016/S1876-3804(20)60058-1

†: student/advisee/co-advisee author; *: with full manuscript; #: with extended abstract.

Recent Service Activities

- *Editorial Service:*
  - Associate Editor: J. of Natural Gas Science and Engineering (2015-2023)
  - Managing Special Issue Guest Editor: J. of Petroleum Science and Engineering (2022-23), Energies (2022-23)
  - Editorial Board Member: Int. J. of Oil, Gas and Coal Technology (2012-2020)
  - Reviewer: SPE Journal, SPE Production and Operations, Computers & Geosciences, J. of Petroleum Science and Engineering, Int. J. of Coal Geology, J. of Natural Gas Science and Engineering, Int. J. of Oil, Gas and Coal Technology, Petroleum Science and Technology.

- *Conference Service:*
  - **2025** Member, Technical Program Committee / Session Co-Chair, SPE Europe Energy Conference, Vienna, Austria, 10-12 June
  - **2024** Member, Technical Program Committee, SPE Europe Energy Conference, Turin, Italy, 26-28 June
  - **2023** Member, Organization Committee, 32nd ITU Petroleum and Natural Gas Seminar and Exhibition, Istanbul, Turkey, 22-23 June
  - **2022** Member, Organization Committee, 31st ITU Petroleum and Natural Gas Seminar and Exhibition, Istanbul, Turkey, 30 June - 1 July
  - **2021** Member, Technical Program Committee, Mediterranean Geosciences Union (MedGU) Conference, Istanbul, Turkey, 15-18 November
  - **2021** Member, Technical Program Committee, The Abu Dhabi International Petroleum Exhibition and Conference (SPE ADIPEC), Abu Dhabi, UAE, 9-12 November
  - **2021** Member, Technical Program Committee, SPE Annual Technical Conference and Exhibition (SPE ATCE), Dubai, UAE, 21-23 September
  - **2021** Member, Organization Committee, 30th ITU Petroleum and Natural Gas Seminar and Exhibition, virtual, 8-9 July
  - **2020** Member, Technical Program Committee, The Abu Dhabi International Petroleum Exhibition and Conference (SPE ADIPEC), Abu Dhabi, UAE, 9-12 November
- *Other Service:*
  - **2023** Member, SPE Academic Task Force
  - **2019-2024** Member, SPE Reservoir Technical Discipline Advisory Committee
  - **2019-2020** Member, SPE Awards and Recognition Committee
  - **2018-19** Chairperson, SPE International Formation Evaluation Award Committee
  - **2016-19** Member, SPE International Formation Evaluation Award Committee

Teaching Experience

Sultan Qaboos University, Muscat, Oman
- PNGE 4101: Statistics for Engineers
- PNGE 5402: Petroleum Data Analytics
- PNGE 6121: Economic Evaluation of Subsurface Reservoirs (graduate level)
- PNGE 6211: Petroleum Data Mining (graduate level)

Istanbul Technical University, Istanbul, Turkey
- PET 328E: Geo-Energy Data Analytics
- PET 412E: Petroleum and Natural Gas Economics
- PET 513E: Numerical Reservoir Simulation (graduate level)
- PET 596E: Scientific Research, Ethics and Seminar (graduate level)
- PET 4901E: Petroleum and Natural Gas Engineering Design I (coordination)
- PET 4902E: Petroleum and Natural Gas Engineering Design II (coordination)

Near East University, online, as a part-time instructor
- PGE 507: Advanced Reservoir Engineering (graduate level)
- PGE 516: Numerical Reservoir Simulation (graduate level)

Middle East Technical University, Northern Cyprus, Güzelyurt, Northern Cyprus
- PNGE 343: Petroleum Reservoir Engineering I
- PNGE 344: Petroleum Reservoir Engineering II
- PNGE 490: Petroleum Engineering Research
- PNGE 411: Petroleum Property Valuation
- PNGE 418: Petroleum Engineering Design II
- PNGE 443: Enhanced Oil Recovery Methods
- PNGE 444: Mathematical Modeling of Hydrocarbon Reservoirs
- PNGE 450: Introduction to Geothermal Reservoir Engineering

Penn State University, University Park, Pennsylvania, USA
- P N G 411: Introduction to Petroleum and Natural Gas Extraction
- P N G 489: Engineering Evaluation of Oil and Gas Properties