# Romal Ramadhan

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## Skills

Technical skills: CMG, Petrel, Eclipse, MBAL, Pressure Transient Analysis (PTA), and Origin.

## Academic Qualifications

**University of Texas at Austin** Expected Graduation: May 2028
*Ph.D. in Geosciences*
Relevant Coursework: Reservoir Simulation, Advanced Reservoir Engineering, Applications of Data Analysis, Visualization in Geosciences, Python and Machine Learning in Geosciences.
Co-Advisors: Dr. Seyyed A. Hosseini and Dr. Larry W. Lake

**Chulalongkorn University** Jan 2023
*M.S. in Georesources and Petroleum Engineering*

**Universitas Islam Riau** Jun 2018
*B.S. in Petroleum Engineering*

## Related Experience

**Graduate Research Assistant** Aug 2024 – Present
*Gulf Coast Carbon Center (GCCC), Bureau of Economic Geology* (BEG)

- Developed and engineered a novel boundary condition modeling approach that reduced simulation grid size by up to ~80% while maintaining high pressure prediction accuracy for $CO_2$ storage reservoirs.
- Streamlined reservoir simulation workflows, delivering up to ~20x faster runtimes for both homogeneous and heterogeneous aquifer models without sacrificing regulatory or Class VI permit compliance.
- Enhanced regulatory submissions and risk management by improving Area of Review (AoR) estimates, supporting early-stage screening and decision-making for large-scale CCS projects.

**Reservoir Engineer (Research)** Jan 2023 – Jun 2024
*Carbon Capture and Storage Frontier Research Centre, Chiang Mai University*

- Led multi-disciplinary modeling projects on $CO_2$ storage in deep saline aquifers, advancing storage security by quantifying trapping mechanisms (residual, solubility, mineral) and assessing caprock integrity through coupled geomechanical and geochemical simulations.
- Optimized $CO_2$ plume migration monitoring strategies by integrating spatial-temporal simulation and risk assessment, contributing findings to peer-reviewed journals on subsurface containment dynamics.
- Advanced numerical simulation of pressure evolution and geochemical interactions, providing critical insights for safe long-term injection and reservoir performance in complex geological settings.

**Jr. Reservoir Engineer** May 2019 – Dec 2020
*PT Rafflesia Bisnis Komersial*

- Built multi-stage fractured horizontal (MSHF) models in CMG-IMEX to test landing zone, lateral length, stage/cluster spacing, and inter-well spacing; recommended pad layout delivering ~12–18% higher EUR/well.

- Operationalized CMOST design-of-experiments on IMEX cases to optimize spacing/stacking and sequence; quantified parent–child interference and frac-hit risk, setting spacing rules that protected legacy producers.
- Calibrated stimulated reservoir volume (SRV) and fracture conductivity using early-time production matches (under 10% error) and pressure data; produced decision-grade type curves and economics to rank locations by NPV.

## Presentations

- Oral: "Efficient Boundary Modeling for $CO_2$ Storage in Saline Aquifers", Geological Society of America (GSA) Connect 2025, San Antonio, Texas, 2025.
- Poster: "*Reservoir simulation optimization: quantitative evaluation of reduced-grid models with boundary condition accuracy for subsurface energy and waste storage*", 14th Annual Research Symposium of Jackson School of Geosciences, Austin, Texas, 2025.
- Oral: "*Numerical simulation of potential site for $CO_2$ sequestration in a depleted oil reservoir in northern Thailand*", 7th International Conference on Renewable Energy and Conservation (ICREC 2022), Paris, France, 2022.
- Oral: "*Correlation comparison for prediction of density and viscosity of aqueous 2-(ethylamino)ethanol (EAE) for carbon capture*", AUA Academic Conference on Sustainable Energy and Green Technology, Kuala Lumpur, Malaysia, 2022.

## Accolades and Honors

**Carbon Dioxide Removal (SMART-CDR) Competition** — Semi-finalist **|** Sep 2024 – Dec 2024

- Built an integrated geophysical & reservoir simulation workflow to track $CO_2$ plume migration in CCS, improving detection confidence while reducing interpretation cycle time.
- Combined geological modeling with data assimilation and sensitivity analysis to rank monitoring technologies, strengthening storage integrity and lowering long-term surveillance costs.
- Delivered end-to-end models and decision-ready visuals that enabled faster trade-off decisions on survey design, frequency, and coverage for scalable $CO_2$ monitoring programs.
  **Tools**: Petrel · CMG · MATLAB · Madagascar | Methods: reservoir simulation, geophysical interpretation, data assimilation, sensitivity/uncertainty analysis, CCS monitoring design

## Selected Publications

- **Ramadhan, R.,** and Hosseini, SA., (2025). "*Efficient Numerical Model Implementation for Boundary Conditions in Geological $CO_2$ Storage*". Under review.
- **Ramadhan, R.,** Abdurrahman, M., Arsad, A., Rahman, AFA., Napitupulu, V., and Restu, WK., (2025). "*Reservoir heterogeneity and its role in long-term $CO_2$ storage performance: A case study of Air Benakat formation*". Deep Resources Engineering
- Tangparitkul, S., Akamine, T., **Ramadhan, R**., Thanasaksukthawee, V., Tapanya, C., Tantisattayakul, T., and Kanchanapiya, P., (2025) "*$CO_2$ Storage Infrastructure and Cost Estimation for Bioenergy with Carbon Capture and Storage in Northern Thailand*". Carbon Capture Science & Technology.

- **Ramadhan, R**., Tapanya, C., Thakheru, A., Leelasukseree, C., and Tangparitkul S., (2024). "*$CO_2$ Trapping Dynamics in Tight Sandstone: Insights into Trapping Mechanisms in Mae Moh's Reservoir*". Environmental Management.
- **Ramadhan, R**., Mon, M, T., Tangparitkul, S., Tansuchat, R., and Agustin D., A., (2024). "*Carbon capture, utilization, and storage in Indonesia: an update on storage capacity, current status, economic viability, and policy*". Energy Geosciences.
- **Ramadhan, R**., Promneewat, K., Thanasaksukthawee, V., Tosuai, T., Babaei, M., Hosseini, S, A., Puttiwongrak, A., Leelasukseree, C., and Tangparitkul, S., (2024). "*Geomechanics Contribution to $CO_2$ Storage Containment and Trapping Mechanisms in Tight Sandstone Complexes: A Case Study on Mae Moh Basin"*. Science of Total Environment.
- Akamine, T., Tosuai, T., **Ramadhan, R.,** Promsuk, N., Srisuriyachai, F., and Tangparitkul, S., (2024). "*Visualizing oil displacement by nanofluids at pore scale: A concentration-dependent nanofluid spreading induced by structural disjoining pressure*". Capillarity.
- Tapanya, C., Fongkham, N., **Ramadhan, R.,** Tangparitkul, S., (2024). "*Relative Permeability-Dictated Huff-n-Puff Technique in Tight Reservoirs: Suitability and Limitation toward Field Implementation*". Energy & Fuels.
- Abdurrahman, M., Kamal, M. S., **Ramadhan, R.,** Daniati, A., Arsad, A., Abdul Rahman, A. F., and Rita, N., (2023). "*Ecofriendly natural surfactants in the oil and gas industry: A comprehensive review*". ACS Omega.
- **Ramadhan, R**., Abdurrahman, M., Bissen, R., and Maneeintr, K., (2023). "*Numerical simulation of potential site for CO2 sequestration in a depleted oil reservoir in northern Thailand*". Energy Reports.