

JAEBUM PARK

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SUMMARY

Ph.D. graduate with extensive experience in industry collaborations with Hilcorp, Shell, ONGC, and Samsung. Skilled in Enhanced Oil Recovery techniques for reservoirs, utilizing experimental and numerical methods, and solving complex flow assurance challenges.

SKILLS

Python (Scikit-Learn, Tensor Flow), R (including Bayesian module), MATLAB, LabVIEW, reservoir simulation (CMG, UTCHEM, PVTsim), computational fluid dynamics (ANYSYS Fluent, COMSOL), industrial design (Illustrator, SolidWorks, CATIA, AutoCAD, Rhinoceros), chemical and material analysis (rheometer, tensiometer, goniometer, chromatography, XRF, EIS), imaging (SEM, AFM), special core analysis (permeability, porosity, relative permeability, MICP, wettability measurements), micro and nano scale materials design (etching, sputter, photolithography, CVD, PDMS molding), manufacturing (3D printer, machining, micro-controller)

EXPERIENCE

Chemical EOR UT Consortium, The University of Texas at Austin

Austin, TX

Graduate Research Assistant

August 2018 – December 2024

- **Specializing in Chemical Enhanced Oil Recovery (CEOR), Reservoir Engineering and Interface Chemistry**
 - **Surfactant-Based Enhanced Oil Recovery Design:** Developed oil recovery methods with mobility control agents like AM/ATBS polymer and methane-induced low-tension gas foam, achieving up to 95% OOIP recovery in high-temperature sandstone reservoirs (70–250 mD) under industrial joint project conditions with Hilcorp.
 - **Enhanced Optimum Salinity Prediction Accuracy:** Increased surfactant microemulsion phase behavior salinity prediction accuracy by 30% using a mass-based mixing rule for diluent toluene and solution gas in live oil, validated by experimental data and HLD-NAC phase behavior simulation.
 - **Mobility and Transport Analysis:** Experimentally identified sandstone permeability thresholds, with severe reductions at 30 mD or below, minimal reductions above 100 mD, and moderate reductions in between for SP floods, validated by reservoir simulation. LTG showed no permeability reduction, ensuring effective mobility control and higher recovery.

Shell Houston Technology Center, Lubricant Discovery Hub, Shell USA Inc.

Houston, TX

Digital R&D Intern

May 2023 – August 2023

- **Digitalization of Oil Condition Monitoring (OCM) System**
 - **Automation of Lubricant Oil Test Rigs:** Implemented PID controllers to automate sequential operations on lubricant oil test rigs, significantly increasing testing speed and reducing the need for on-site technical personnel.
 - **EIS Data Conversion:** Developed a code to translate electrochemical impedance spectroscopy (EIS) data into electrical circuit models with resistance and capacitance parameters, using regression to automatically output these values.
 - **Enhanced OCM Prediction Accuracy:** Improved OCM prediction accuracy by 15-40% through two methods: a temperature and time effect model based on engineering principles, and a data-driven approach using binary symbolic regression.

CETCO Energy Services, Minerals Technologies Inc.

Houston, TX

R&D Intern

June 2022 – August 2022

- Performed coalescer filter flow loop pilot testing for offshore produced water treatment targeting oil macroemulsions
- Optimized coalescer geometry based on flow dynamics modeling and statistical analysis of oil emulsions

Institute of Advanced Machines and Design

Seoul, Republic of Korea

Researcher

January 2017 – May 2018

- Investigated particle-laden droplet spreading to understand droplet infection mechanisms
- Studied the dynamics of spherical and rod-shaped elastic particles inside droplets during evaporation

Korea Institute of Machinery and Materials

Daejeon, Republic of Korea

Technical Research Personnel, Fulfilling Republic of Korea Military Service

December 2013 – December 2016

- **Offshore pipeline flow assurance problems**
 - Developed a flow homogenizer to manage slug flow and measure flow rate at risers using Venturi meters
 - Researched terrain-induced slugging in gas-water two-phase flow in W-shaped and undulating horizontal pipelines
- **Industrial heat transfer problem:** Optimizing heat transfer limits of macroscale thermosiphon heat exchangers

Micro Fluid Mechanics Laboratory, Seoul National University

Seoul, Republic of Korea

Graduate Research Assistant

August 2011 – November 2013

- Studied micro-scale oil/water interface flow and wave dynamics driven by Electrowetting-on-Dielectric (EWOD)
- Identified critical parameters to prevent liquid prism oscillation in both dynamic and electrochemical contexts for Samsung Electronics and Samsung Advanced Institute of Technology

EDUCATION

Ph.D. in Petroleum and Geosystems Engineering

December 2024

University of Texas at Austin, Hildebrand Department of Petroleum and Geosystems Engineering

Overall GPA: 4.00/4.00

- Thesis Title: Surfactant EOR in High Temperature High Pressure Sandstone Reservoirs with Mobility Control

Master of Science, Statistics and Data Science, UT Austin

May 2023

Master of Science, Mechanical and Aerospace Engineering, Seoul National University (SNU)

August 2013

Bachelor of Science in Mechanical and Aerospace Engineering, Summa Cum Laude, SNU

August 2011

Bachelor of Science in Materials Science and Engineering, Summa Cum Laude, SNU

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PUBLICATIONS

- [1] **J. Park** and K. K. Mohanty, “*Design of Surrogate Oils for Surfactant-Brine-Oil Phase Behavior*”, SPE Improved Oil Recovery Conference (2022)
- [2] **J. Park**, J. Ha, K. Choi, J. Bae and H.-Y. Kim, “Critical AC frequency for stable operation of electrowetting-driven optofluidic devices with polymeric electrolyte solutions,” *Journal of Mechanical Science and Technology* 33.4 (2019): 1793-1797.
- [3] J. Lee, **J. Park**, J. Kim and S. M. You, “Flow visualization inside thermosyphon for measuring heat transfer limit,” *Journal of Heat Transfer* 139.2 (2017): 020911.
- [4] J. Ha, **J. Park**, Y. Kim, B. Shin, J. Bae and H.-Y. Kim, “Interfacial waves generated by electrowetting-driven contact line motion,” *Physics of Fluids* 28 (2016): 02102.
- [5] J. Lee, **J. Park** and S. Sohn, “Visualization of terrain-induced slugging in w-shaped pipeline,” *Journal of Heat Transfer* 138.2 (2016): 020908.
- [6] J. Lee, S. Sohn, **J. Park** and D.-W. Oh, “Visual criteria for measuring two-phase flow rate in Venturi with flow homogenizer,” *Journal of Heat Transfer* 137.8 (2015): 080911.
- [7] J. Lee, S. Sohn and **J. Park**, “Visual observation of circular water jet impingement boiling on stationary hot steel plate,” *Journal of Heat Transfer* 137.8 (2015): 080910.
- [8] J. Park, **J. Park**, H. Lim and H.-Y. Kim, “Shape of a large drop on a rough hydrophobic surface,” *Physics of Fluids* 25.2 (2013): 022102.
- [9] D.-G. Lee, **J. Park**, J. Bae and H.-Y. Kim, “Dynamics of a microliquid prism actuated by electrowetting,” *Lab on a Chip* 13.2 (2013): 274-279.

AWARD & LEADERSHIP

- **John and Kelli Weinzierl Endowed Presidential Fellowship in Petroleum and Geosystems Engineering** 2024
- **President** *The University of Texas at Austin Korean Student Association (UTKSA)* 2020 – 2021
- **The University of Texas at Austin Graduate School Fellowship** 2018 – 2022
- **Seoul National University Superior Academic Performance Scholarship** 2011 – 2012
- **Brain Korea 21 Research Scholarship** 2011 – 2013
- **National Scholarship for Natural Science and Engineering** 2007 – 2011
- **Award by Minister of Education (2nd prize), Science and Technology, Republic of Korea** Nov. 2010
2010 Korea National Capstone Design Contest, "Mouse for disabled person"