

# RAHUL VERMA

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## EDUCATION

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<b>The University of Texas at Austin</b> PhD candidate, Petroleum Engineering GPA: 3.7/4.00	Austin, Texas Aug 2018
<b>The University of Texas at Austin</b> Master of Science, Petroleum Engineering	Austin, Texas December 2014
<b>Indian Institute of Technology</b> Bachelor of Engineering, Chemical Engineering	Guwahati, India May 2010
<b>Springboard Data Science Career Track</b> Data Science/Machine learning certification	January-May, 2018

## SKILLS

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<b>Programming languages</b>	C/C++, Fortran, Python, MATLAB
<b>Parallel computing</b>	MPI, OpenMP
<b>Data processing</b>	pandas (data wrangling, cleaning), SQL
<b>Machine learning</b>	scikit-learn (regularized regression, random forest, gradient boosting, neural networks, cross validation, hyper-parameter selection), statsmodels
<b>Visualization Software</b>	Matplotlib, Seaborn, Plotly, PyQtGraph, Bokeh, ImageJ, Paraview
<b>Other software</b>	L <sup>A</sup> T <sub>E</sub> X, OpenFOAM, Palabos, LSMPQS

## INDUSTRY EXPERIENCE

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<b>Sandbox Semiconductor - Computational Engineer</b>	January -December 2017
<ul style="list-style-type: none"><li>Implemented level set methods for simulating a patent-pending machine learning model for etching in semiconductors. Work presented in several international conferences</li><li>Used Python to construct reaction database, and interface with C/C++ library</li><li>Supervised offshore team to make user interface for software, and connect it to computational model</li></ul>	
<b>Chevron - Petroleum Engineering Intern</b>	May - August 2015, May-August 2014
<ul style="list-style-type: none"><li>Developed new techniques to quantify petrophysical properties from high resolution thin-section carbonate rock images from Chevrans Tengiz reservoir</li><li>Generated relative permeability and capillary pressure properties for both carbonate samples (conventional reservoirs), and shales (unconventionals, from Vaca Muerta, Argentina)</li><li>Worked on relating wettability measurements to values measured from thin sections</li><li>Conducted training seminar for company employees, deploying newly developed algorithm</li></ul>	
<b>Reliance Industries Limited - Manager, Jamnagar Refinery</b>	August 2010 - July 2012
<ul style="list-style-type: none"><li>Developed model for predicting product quality in alkylation unit, based on combination of chemical reactor model and non-linear optimization of plant data</li><li>Developed model for predicting product quality in hydrotreating units, using neural networks and non-linear optimization on large multi-year datasets</li><li>Deployed models as Visual Basic tools for use by plant operators</li><li>Used commercial CFD software Fluent to troubleshoot Sundyne pumps by modeling cavitation</li></ul>	

## ACADEMIC EXPERIENCE

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### PhD candidate, The University of Texas at Austin

August 2012-present

- Developed the parallelized LSMPQS level set library, written in C/Fortran, and Python/MATLAB, for understanding capillary-dominated flow in porous media, and related results to experimental datasets at larger scales, quantifying effects of wettability in multiphase flow.

### Teaching Assistant, The University of Texas at Austin

August 2014 - May 2015

- Courses: Thermodynamics, Formation and solution of geosystems problems, Transport Phenomena

### Research Assistant, RWTH Aachen, Germany

May 2009 - July 2009

- Worked on development of a Poisson solver using the GMRES algorithm, funded by a scholarship from the German embassy

### Selected Graduate Courses:

Transport Phenomena, Parallel Computing, Advanced Reservoir Engineering, Surface Phenomena, Drilling Engineering, Advanced Thermodynamics, Advanced Well-logging, Formation Evaluation, Modeling flow in porous media, Numerical Simulation of Reservoirs, Advanced Petrophysics, Image Analysis

## PUBLICATIONS

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**Verma**, Prodanovic (201X): A new level set framework to model trapping in porous media (*Under preparation*)

**Verma**, Prodanovic (201X): Flow through sandwiched lenses in three-phase experiments in sandpacks (*Under preparation*)

**Verma**, Icardi, Prodanovic (2018): Effect of wettability on two-phase quasi-static displacement - validation of two pore-scale modeling approaches, *J. of Contaminant Hydrology*

Chen, **Verma**, Prodanovic, Espinoza (2017): Pore-scale determination of relative permeability in hydrate-bearing sediments using X-Ray computed micro-tomography and lattice Boltzmann simulation, *Water Resources Research*

Chopra, Helpert, **Verma**, Bonnecaze (2017): A model-based, Bayesian approach to the CF<sub>4</sub>/Ar trench etch of SiO<sub>2</sub>, *Design-Process-Technology Co-optimization for Manufacturability XII, SPIE Advanced Lithography*

## AWARDS AND EXTRA-CURRICULAR ACTIVITIES

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Olympiads: Indian National Chemistry Olympiad, 2005, National Science Olympiad, regional Mathematics Olympiad, 2005

KC Mahindra Scholarship for post graduate studies, May 2012

WISE Scholarship, German embassy, May 2009

Member of department Intramural soccer team at UT Austin