

COLIN STURM, PHD, PE

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SENIOR PRODUCTION ENGINEER

I am a senior production engineer with 14 years of experience in management, well optimization, facility optimization, reservoir modelling, simulation and modelling, and computer programming. I'm accustomed to working in diverse teams, in the field, and have delivered cost and time savings on a variety of projects. My goal is to develop innovative engineering solutions that consistently improve operations and further organizational objectives.

EXPERIENCE

APACHE CORPORATION | Houston, TX

2014 to 2020

Senior Production Engineer / Production Engineer III

Senior Production Engineer (2017-2020)

- **Dynamic Optimized Pumping Routes**
 - Developed an algorithm in Python to optimize pumper routes based on production, risk, and proximity.
 - Reduced drive time and mileage by 30% and pumper's daily route automatically directed to 75% greater potential cash margin.
 - Began scaling out to all of Apache North America: Currently running 10% of Apache NA routes, 5 MBBLD, 20 MMSCFD, with more than 100 users of the optimization algorithm.
 - Created a mobile report with asset tracking and relevant well site information for pumpers on site.
 - Project managed a team of 5 in multiple disciplines: ESRI mapping, field implementation, data management, programming, and statistics.
- **Predicted seismic induced activity** – Collaborated with Auckland University researchers to develop an algorithm that predicts pressure buildup and local seismic activity of salt water disposal.
 - Autonomous ISIP picking reducing human error, increasing confidence and accuracy.
 - Coauthored best paper out of 600 submissions awarded by US Rock Mechanics Symposium.
- **Completion data collection** – created an algorithm to run on a Raspberry Pi, connect to a service company network, and transmit relevant data to Apache.
 - Reduced third party companies from data flow lowering per well cost by \$3000.
 - Cut the time needed to bring data to near time from days to seconds.
 - Lessened the potential for error by reducing the necessity for human interaction.
- **Extended analysis of StimPlan simulations** – rock fracture modelling of injected chemicals, surfactants, proppant, and water, with a team of 3 covering disciplines of reservoir, petrophysics, and geology.
 - Launched a Python web framework accessible within Apache network to house multiple applications.
 - Time of Stimplan analysis reduced from days to minutes using Python algorithm.
- Organized and led a monthly completion data networking and governance meeting for all North America.

Production Engineer III (2014-2017)

- **Optimized production wells** in Oklahoma (SCOOP/STACK) and Texas (Austin Chalk).
- **Tank leak detection** – used machine learning in Python with Cygnet and OSI PI to improve leak detection of holding tanks. Reduced false positive +30%, and increased true positives 50%.
- **Initial Shut-in Pressure escalation and plateau** – developed a workflow in Spotfire utilizing Python and R to estimate fracture dimensions based on published theory.
- **Frac AFE Cost Estimation** – Improved workflow regions used to estimate the cost of completing a well.
- **Designed a well completion database** used by all districts.
- Managed rotational engineers and interns.

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PROCTER & GAMBLE (P&G) | Brussels, Belgium **2011 to 2013**

Modeling & Simulation, Research & Development Engineer

- **Saved \$2.5 million/year** by optimizing a manufacturing process.
- Led design, validation, and implementation of a \$2 million customized 3D finite element method (FEM) particle tracking software using linear programming (with Altair Engineering).
- Created, developed and led a global 5 day training course in a Python programming.
- Designed an internal global engineering software for pipe flow and rheology modeling.
- Developed linear least squares regression for fast curve analysis.

WINSIM INCORPORATED | Houston, TX **2007 to 2011**

Senior Process Simulation Engineer

- Maintained and developed process facility simulation, similar to AspenTech or Hysys.
- Modelled projects: compressors, pumps, separators, etc. in surface and offshore.
- Organized a weekly meeting with peers to review technical questions and brainstorm solutions.
- Remediated problems by extensive research of thermodynamic and engineering theory.
- Solved customer problems related to PVT modeling of black oil and compositional fluids.

EDUCATION & TRAINING

Doctor of Philosophy, Chemical Engineering | University of Florida | Gainesville, FL | 2007

Bachelor of Science, Chemical Engineering / Minor: Chemistry | University of Oklahoma | Norman, OK | 2002

TECHNOLOGY

Avocet	Python	Fortran	Spotfire
Stimplan	VBA	Matlab	Tableau
Harmony	Java	HTML	Power BI
Hysys	JavaScript	Latex	SQL/Access

PUBLICATION

Lavoie, V., Sturm, C., Willson, S.M., Lee, J., Purdue, G., Dempsey, D., 2017, A method to assess potential induced seismicity hazard with application to the Duvernay. American Rock Mechanics Association, 18-881

AFFILIATIONS & ACTIVITIES

Licensed Professional Engineer #121960, Texas Board of Professional Engineers | 2015 to present

Member, Society of Petroleum Engineers

Sports Chair, Apache Corporation | Houston, TX | 2017 to 2020

President, New Hire Intern Transferee Program | P&G | Brussels, BE | 2012 to 2013

First Place Winner – Houston Startup Weekend 2013 | Created a plant monitoring device.