TIM SODERGREN

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SUMMARY

A senior scientist with over 15 years of success working in a multi-disciplinary environment. Expertise in data modeling and integration with an extensive background in data analysis methods and laboratory geomechanics. Recognized as an effective communicator with a long history of teaching, mentoring, and public speaking. Key competencies include:

- Multivariate Statistics
- Scientific Computing
- Software Development
- Multi-scale Data Integration
- Data Management
- Project Management
- Teaching and Mentoring
- Petrophyscial Modeling
- Unconventional Reservoirs

PROFESSIONAL ABILITIES AND RESULTS

Data Analysis and Interpretation

- Developed comprehensive, field-wide petrophysical models that consistently reduced cost while increasing field production for several unconventional reservoirs including the Haynesville, Barnett, and Marcellus Shales.
- Invented TerraTek Heterogeneous Rock Analysis (HRA) method that enabled statistical rock classification and has significantly increased business as part of the Schlumberger Techlog Unconventional package.
- Developed fully integrated project workflow that won the Eureka Prize for the 2008 Schlumberger Reservoir Symposium.

Rock Properties Analysis and Data Integration

- Developed a novel method for predicting core-measured properties from log data and generating synthetic log curves that enabled the creation of fully calibrated petrophysical models with increased accuracy for well production and completions.
- Collaborated in team that created an optimization method for selecting representative sample locations for core testing that produced more accurate petrophysical models through cost effective core analysis.
- Developed a method for creating fully calibrated in-situ stress models utilizing wireline logs, lab-measured geomechanical properties and field stress measurements (MDT, DFIT, etc.) which optimized completions and well performance.
- Served as Key Technical Reviewer providing input and guidance that ensured validity of new core analysis technology deployments including the TerraTek Tight Rock Analysis, TRA2 system.
- Led a multi-disciplinary team in the integrated analysis of unconventional reservoirs that successfully incorporated petrophysics, geology, and engineering data.

Technical Community Involvement

- Received nomination and selection as Leader of the Schlumberger Unconventional Resources special interest group and established regular webinar series and “tech-watch” newsletter that presented different technical topics throughout the organization.
- Collaborated as Panel Speaker presenting "Core Handling and Preparation Quality Control - The Key to Consistency and Validity", SPWLA Annual Symposium Short Course - Laboratory Measurements of Shale Gas Cores, Colorado Springs, Colorado, May 14, 2011.
- Served as panel speaker for "Whole Core or Rock Fragments?” SPWLA 2010 Spring Topical Conference on Unconventional Gas Petrophysics, Austin, Texas, April 26, 2011.

Teaching and Mentoring

- Principal instructor for the TerraTek Tight Rock Analysis (TRA) Primer course.
- Core analysis instructor for the Schlumberger Petro Technical Services Essentials of Shale Gas course.
- Instructor for both the Petrel and Techlog Heterogeneous Rock Analysis (HRA) plug-ins.
- Member of the Schlumberger Petrophysics Development Advisory Board (DAB), helping to refine necessary competencies for company petrophysicists.
- Principal instructor for the core analysis portion of the Schlumberger Unconventional Reservoirs High Intensity Training (HIT) course.
- Schlumberger NExT instructor.

SOFTWARE SKILLS

- Matlab, Scilab, MySQL, Javascript+D3, C++, Java, Python, JSP

PROFESSIONAL EXPERIENCE

UNIVERSITY OF UTAH SCIENTIFIC COMPUTING AND IMAGING INSTITUTE **2016-PRESENT**
Graduate Research Assistant

ALTA PETROPHYSICAL LLC **2015 – 2016**
Consultant in Computational Petrophysics

TERRATEK, A SCHLUMBERGER COMPANY **2002-2014**
Core Petrophysics Domain Champion
Data Integration Manager
Senior Petrophysicist

QUANTECH GEOSCIENCE **2002**
Geophysical Field Assistant

UNIVERSITY OF UTAH ENERGY AND GEOSCIENCE INSTITUTE **2000 – 2002**
Research Assistant

EDUCATION

- **PhD student in Computing, University of Utah –** Data analysis/management started 2016
  - Current research: Mobile sensor network coverage via topological data analysis
- **MS in Geophysics, University of Utah – 2003**
  - Thesis: Deep Fluid State and Thermal Regime of the Central Great Basin, Nevada Inferred from Electrical Resistivity
- **BS *cum laude* in Geophysics, University of Utah – 1999**

MILITARY EXPERIENCE

Served 23 years in the U.S. Army and Army National Guard including a tour of duty in Afghanistan in support of Operation Enduring Freedom. Served in various positions culminating in an assignment as the Communications Staff Officer for I Corps Artillery and the 65th Fires Brigade. Retired in 2012 with the rank of Major.

PUBLICATIONS AND PRESENTATIONS

Handwerger, D., Ma, Y. Z., Sodergren, T. (2015). “Effective Core Sampling for Improved Calibration of Logs and Seismic Data”, in Y. Z. Ma and S. A. Holditch (Eds.), Unconventional Oil and Gas Resources Handbook: Evaluation and Development

Handwerger, D., Sodergren, T., Russon, L., "Effectiveness of neural networks in predicting core measured properties from log data.", SPWLA Topical Conference on Computational Petrophysics, Asheville, North Carolina, October 9-12, 2011.

Sodergren, T., Khan, S., "Integrated Analysis for Unconventional Reservoirs", Short Course, CSPG CSEG CWLS Joint Annual Convention, Calgary, Canada, May 16, 2011.

Sodergren, T., "Core Handling and Preparation Quality Control - The Key to Consistency and Validity", SPWLA Annual Symposium Short Course - Laboratory Measurements of Shale Gas Cores, Colorado Springs, Colorado, May 14, 2011.

Sodergren, T., Handwerger, D., Vaughn, K., Lutz, S., "Accounting for all of the Hydrogen Measured by Neutron Porosity Logs", SPWLA Topical Conference on Unconventional Gas Petrophysics, Austin, Texas, April 25-29, 2010.

Wannamaker, P., Hasterok, D., Johnston, J., Stodt, J., Hall, D., Sodergren, T., Pellerin, L., Maris, V., Doerner, W., Groenewold, K., and M. Unsworth, "Lithospheric dismemberment and magmatic processes of the Great Basin-Colorado Plateau transition, Utah, implied from magnetotellurics", Geochem. Geophys. Geosyst., 9, Q05019, doi:10.1029/2007GC001886, 2007.

Handwerger D., Suarez-Rivera, R. , Sodergren, T., Milner, M. and K. Greaves, "Application of n-dimensional Log Analysis in Predicting Reservoir Properties from Core Data in both Cored and Un-cored Wells in Tight Gas Reservoirs", AAPG Rocky Mountain Section, Snowbird, Utah, October 7-9, 2007.

Handwerger, D. A., Sodergren, T. and R. Suarez-Rivera, "Application of n-dimensional log analysis in predicting reservoir properties from core data in both cored and un-cored wells in tight-gas shale and sand reservoirs", SPWLA-SCA Topical Conference on Core-Log Integration, Sunriver, Oregon, March 25-29, 2007.

Sodergren, T., Suarez-Rivera, R., and R. Plumb, "Rock Mechanics Database Significantly Improves Pre-Drill Operational Risk Analyses", Alaska Rocks 2005 conference: Rock Mechanics for Energy Mineral and Infrastructure Development in the Northern Regions, Anchorage, AK, 2005.

Wannamaker, P. E., Hasterok, D. P., Johnston, J. M., Sodergren, T. L., and W. M. Doerner , "Non-uniform Extensional Processes Influenced by Fluid and Melt Distributions Below the Great Basin-Colorado Plateau Transition Zone, Utah, Revealed Through Electrical Conductivity Structure", Eos Trans. AGU, 85(47), Fall Meet. Suppl., Abstract TB53D-06 , 2004.

Wannamaker, P. E., Doerner, W. M., Stodt, J. A., Sodergren, T. L., and B. D. Rodriguez, "Analysis of magnetotelluric profile data from the Ruby Mountains metamorphic core complex and southern Carlin Trend region, Nevada", U. S. Geol. Surv. Open File Rep., in press , 2002.

Wannamaker, P. E., Doerner, W. M., Sodergren, T. L., and J. A. Stodt, "Rheology and thermal state of the Great Basin and its transition to the Colorado Plateau, Western United States, inferred from electrical resistivity structure" , 16th EM induction workshop, Santa Fe, NM, 2002.

Hasterok, D. P., Sodergren, T. L., Wannamaker, P. E., and M. Unsworth, "3-D MT Modeling the Colorado Plateau and Great Basin, Western United States", 16th EM induction workshop, Santa Fe, NM, 2002.

Wannamaker, P. E., Sodergren, T. L., Stodt, J. A., Hasterok, D. P., 2002, Unsworth, M., and W. M. Doerner, "Resistivity Architecture and Physical State of the Great Basin: Separate and Joint Roles of Fluids and Graphite", Eos Trans. AGU, 83(47), Fall Meet. Suppl., Abstract GP52A-04 , 2002.

PATENTS

Method and apparatus for multi-dimensional data analysis to identify rock heterogeneity United States Patent 7,983,885 Issued July 19, 2011 Inventors: Tim Sodergren, Roberto Suarez-Rivera, David A. Handwerger Describes a method for identifying distinct rock classes in heterogenous reservoirs based on log response.

Heterogeneous earth models for a reservoir field United States Patent 8,200,465 Issued June 12, 2012 Inventors: Tim Sodergren, Roberto Suarez-Rivera, Yi-Kun Yang, David A. Handwerger Describes a method for creating a comprehensive rock class model for a reservoir field based on multiple well evaluation and provides a mechanism for the propagation of measured properties