



Speakers Abstracts February 25, 2020

8:05-9:00am

Welcome and PPDM Update

Trudy Curtis (Professional Petroleum Data Management Association)

Short Biography: Trudy is the Chief Executive Officer of the Professional Petroleum Data Management (PPDM) Association, the global Not-For-Profit society focused on data management best practices and standards and data management as a professional discipline. Based in Calgary, Canada, Curtis has nearly four decades of years of experience in the industry and is known around the world for her outspoken advocacy data as a strategic asset, and its management as a core business function.

After receiving a BSc. from the University of Calgary in 1978, Curtis went to work in the Oil and Gas industry. In 1996, she joined the PPDM Association as architect, CIO and ultimately CEO of PPDM Association. Curtis is leading the way to the emergence of data management as a global discipline, the creation and industry adoption of data management standards and best practices, the development of professional development and certification programs for data managers, and the professionalism of data management in the petroleum industry. In addition to her role as CEO of the PPDM Association, Curtis is co-founder of the Standards Leadership Council.

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*9:00-9:10am*

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9:10-10:10am

AI-based Feature Extraction for Oil Field Geospatial Intelligence – Keynote Presentation

Bill Barna (Microsoft), Sam Cook (ESRI), TBD (Planet), KC Tung (Microsoft)

Description of Presentation: The Permian Basin spans 86,000 square miles, two states, and has thousands of leases and operators. Individual operators manage and protect their assets by installing IoT sensors and cameras. Camera and sensor coverage is limited and these assets are expensive to install and maintain. A better solution is needed.

Satellite imagery is rapidly improving in terms of quality and affordability. Temporal imagery from multiple providers is available through APIs exposed on the Internet. This data can be copied into cloud-based data lakes and evaluated with deep neural network classifiers to extract features. Extracted features can then be integrated with GIS systems to provide oil field intelligence. Soon, these types of



solutions will be able to identify and track oil field assets, monitor the environment for spills and leaks, and identify operational risks.

In this presentation, Microsoft and ESRI will discuss their work using cloud-based AI for feature extraction and workflow integration. Transfer Learning on Databricks will be discussed and demoed. This technique reduces the time and cost to train feature extraction models. General models are trained with large image libraries and then adapted for specific uses by retraining with small, focused image libraries. Microsoft's Computer Vision service will be demo'ed for companies that have limited data science and Python experience. ESRI will discuss its data science technologies and provide an overview of ArcGIS integration with native ESRI tools and Power BI.

To reinforce the content, Microsoft and ESRI will walk the audience through a frac hit risk monitoring solution that is used in hackathons to teach this material. Portions of the frac hit solution and the Databricks Transfer learning demo will be made available through GitHub

Short Biography:

Bill Barna (Microsoft)

Bill Barna works for Microsoft as a Principal Cloud Architect and supports a dozen upstream oil and gas customers in Texas and Oklahoma. He specializes in using cloud-based AI to solve drilling and completion problems. He works closely with ESRI on geospatial solutions for oil and gas. He has an MBA from Southern Methodist University and a Master of Science in Predictive Analytics from Northwestern University.

Sam Cook (ESRI)

Samuel Cook is a geospatial analytics professional with a background in defense and intelligence. His current role emphasizes the development, deployment, and evangelizing of a spatial machine learning and artificial intelligence body of knowledge to help Esri's clients achieve greater success.

KC Tung (Microsoft)

KC Tung is a Cloud Solution Architect at Microsoft. He has experience as a machine learning engineer and data scientist in the development of AI, deep learning, computer vision, and natural language processing (NLP) models. KC leverages open source machine learning libraries such as TensorFlow, Keras, PyTorch, and AzureML to develop and deploy these models. He specializes in end-to-end model and data structure design and testing regiments for cloud-based solutions. KC holds a PhD in molecular biophysics from the University of Texas Southwestern Medical Center in Dallas, Texas.

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*10:10-10:30am*

**Morning Break – Sponsored by Schlumberger**



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10:30-11:05am

Using a Sensor-Driven Completions Operating System to Capture Complete and Truthful Data

Chad Van Buskirk (Cold Bore Technology)

Description of Presentation: Onshore completions operations have become much more complex and expensive in the past fifteen years as the advancements in technology have enabled the drilling and completion of much longer horizontal wells. Longer laterals have resulted in many more stages per well, along with an increase in the number of wells per pad. As a result, operators are now spending on average, \$7,500 per hour on completions or \$125 per minute. It is imperative that they have very detailed insight into every second of these operations to understand exactly what is occurring in real-time, the duration, as well as the cause and effect. They need to know where they are spending valuable time and resources as well as identifying opportunities to improve their processes across multi well pad operations.

The greatest challenge is that most producers today are still gathering completions operational data in a process that involves manually recording field data by hand by the Company Man who then enters it into an Excel spreadsheet, which is then transferred into other programs used for time log tracking – such as WellView or OpenWells. Like with any process, manually captured data, is not only subjective, but is often inconsistent and subject to errors and omissions. This makes it difficult if not impossible to use the data with any confidence or without many hours spent on data cleaning. And since it is not being captured on a second by second basis, it is a very low-resolution data. All of this presents great risk and concern since multi-million-dollar decisions are based on this information daily. Data integrity and accuracy are paramount.

Many years ago, the drilling industry resolved a similar data acquisition and management challenge by implementing a technology known as an Electronic Drilling Recorder (EDR) system - such as that offered by Pason. With EDR systems, the drilling industry has been correlating multiple data sources in real-time so the drillers can optimize the drilling of the well, in addition to generating actual time log data that enables appropriate payment transactions.

To address these major issues with completions, Cold Bore Technology developed the first Completions Operating System known as SmartPAD. It is a digital system that enables remote access and the visibility of the operations data and critical path work-flow overview, in real-time. The Completions Operating System normalizes the multiple data formats from the various service companies such as Frac, Wireline, Pump Down and Coil, then contextually correlates it to the IIoT sensor-driven operational work-flow data provided directly from the operation of the Frac Tree to generate a Critical Path Timeline. All the data is displayed on the dashboard in real-time so it can be instantly used. All valve positions on the frac tree are also displayed in real-time, which is a significant safety feature for the on-site personnel. Well information management systems such as WellView and OpenWells can then auto populated from the COS to reduce the amount of manual data entry time and to increase the resolution quality of the data. Every second of the operation is recorded and time-stamped along with the detailed context necessary for a complete understanding of the chronological chain of events. This enables comprehensive tracking



of Productivity Efficiency Gains (PEG), Scheduled Operations and Non-Productive Time (NPT) - all critical aspects to track and identify. When all time, data, and operations are tracked to the second, properly captured, organized and managed in real-time, new opportunities of optimization arise for the producer and service companies working side by side. The challenge of different service company data formats will no longer be an issue so operators can now identify and modify new processes opportunities based on the correlation of all their data.

In conclusion, operators are seeking new ways to improve efficiency and reduce costs. This system is the first IIoT-sensor based, completions operating system which enables real-time access, tracking and analysis of multi-well pad operations. It is moving the completions operations from generalized, manual and subjective data capture to granular and automated sensor-driven operational data capture in real-time. It is helping operators improve their efficiency, enhance their onsite visibility, safety and reduce their overall frac time, resulting in costs savings of tens of thousands of dollars per pad. The comprehensive tracking of every minute detail of the operations provides the instantaneous visibility and new insight of the operations.

Short Biography: Chad Van Buskirk is a registered Professional Engineer with 20 years' experience in the oil & gas world. He has worked in 9 countries and 5 continents in that time. Chad has worked as an engineer in completions technology, a fracturing engineer, and in well services as a business development technical sales account representative. Chad has also held a field service manager role, managing 4 countries in well construction. Now a Technical Sales Representative for Cold Bore Technology, Chad works to usher in the Industrial Internet of Things (IIoT) to the O&G Completions space with SmartPAD. Chad is a husband, father of 2, he is halfway through an MBA and his passions include snowboarding, continuous learning and working out.



11:05-11:40am

Art of the Data Possible

Matt Becker (Sullexis Systems LLC)

Description of Presentation: Data management technologies are a dime a dozen and are improving at an ever-increasing rate. How does one determine how to transform data technologies such as cloud storage, data streaming, no-SQL technology, ML and AI into an effective (and cost-saving) data management solution for upstream companies? This article will provide an objective set of examples of a variety of open-source and various vendor solutions to help educate the upstream industry on ways to incorporate various data transformation solutions to provide data insights rapidly, repeatably, and efficiently. Learn the “art of the possible” to leverage effective data transformation processes and technologies along with seamlessly integrated public, private, structured and unstructured data sources. With modern data transformation best practices, see how companies can rapidly provide a data platform to better manage Data analysis, Data Replication, Data Management, BI Tool Connectivity, Support, Scalability, Data Stream and Cluster Monitoring, and Disaster Recovery/Failover.



Short Biography: Matt Becker serves as the Managing Director of Sullexis' Enterprise Data Management practice. He has spent 20+ years implementing strategies that drive client performance through technology adaptation in areas ranging from big data, enterprise data management to business intelligence and analytics. Matt enjoys delivering the value gained by implementing solid information management principles, thereby reducing inefficiencies and gaining insight into overall operational performance.

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***11:40-11:50am***

**Workshop Plus Sponsor Spotlight – WellDrive**

Learn more at [info.welldrive.com](http://info.welldrive.com)

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11:50-1:20pm

Lunch and Tours of Microsoft Technology Center (MTC)

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***1:20-2:05pm***

**Big Data & Analytics – Real Life Challenges, Examples, and Lessons Learned – Panel**

**Cathy Tompkins (Innate Intelligence), Carlos Martinez (Innate Intelligence), and Mark Ferman (Innate Intelligence)**

**Description of Presentation:** The upstream energy industry is no stranger to large quantities of data. Historically upstream firms amassed and processed large amounts of data to enhance planning, exploration, delineation, and field development. So why all the hype about “big data” and what’s different? We will provide an overview of the distinctive challenges and potential value of a Big Data & Analytics approach in the upstream sector. The challenges are real and the stakes are high for companies that want to remain competitive. More specifically we will use real life examples to explore some of the internal and external challenges driving the adoption of Big Data & Analytics as a competitive strategy, provide an overview of several implemented solutions in upstream oil and gas, and talk about some of the pitfalls and lessons learned including the need for a clear strategy, holistic data management, process change, and culture transformation. Some possible use cases for discussion depending on the audience make-up include the following. • Preventative and Predictive Maintenance • Operate by Exception • Well Zone Targeting & Spacing • Frac’ing Techniques The aim of this presentation is to demystify some of the hype around big data and analytics and to present a realistic picture of the pains and gains to be expected. It is not focused on specific technology platforms

**Short Biographies:**



## **Cathy Tompkins (Innate Intelligence)**

Cathy Tompkins is a transformational C-suite level executive with more than 30 years of experience inside Fortune 500 companies and a deep energy and technology background. Her primary practice areas are Information Technology Strategy and Organizational Design. She is an award-winning CIO who has guided organizations through periods of significant change to achieve their strategic objectives. In her most recent role Cathy served as the Senior Vice President - Information Technology and Chief Information Officer for Chesapeake Energy. During her 15-year tenure she led the organization through a period of unprecedented growth followed by a significant industry downturn and an equally substantial shift toward efficiency, cost leadership and digital innovation. She is a graduate of the University of Alabama with a Bachelor of Science degree in Computer Science and is currently an Adjunct Professor of Information Systems at the University of Oklahoma.

## **Carlos Martinez (Innate Intelligence)**

Carlos is the President and Founder of Innate Intelligence. His primary practice areas are ERP Project Advisory and Information Technology Strategy. Visionary leader and entrepreneur with thirty-one years of professional consulting experience in the implementation of enterprise-wide software applications and business transformation solutions in the upstream oil and gas industry. During his career with EDS and PriceWaterhouse, Mr. Martinez performed various consulting roles including systems engineer, management consultant, and Principal Consultant. Mr. Martinez was the President and Founder of Strategic Systems & Products (SSP) where he developed the vision and achieved SAP solution certification for the READYUpstream All-In-One solution. He holds a Bachelor's Degree in Industrial Management from the University of Puerto Rico, a Masters of Business Administration from the University of Texas at Dallas, and has completed Executive Education at the Harvard Business School. He is also a Adjunct Professor of Entrepreneurship at the SMU COX School of Business.

## **Mark Ferman (Innate Intelligence)**

Mr. Ferman has a diverse background of IT and oil and gas experience, including more than 35 years in the upstream and downstream markets. His primary practice areas are Data Analytics and Information Technology Strategy. After graduating from Marshall University, Mr. Ferman went to work for Columbia Gas Transmission where he was responsible for engineering the information systems through the pipeline industry's open transportation transformation. He later became the Chief Information Officer and Vice President of Information Technology for Columbia Natural Resources. Mr. Ferman has entrepreneurial experience as the former Columbia executives started a new oil and gas venture, Triana Energy. Chesapeake Energy purchased Triana and Mr. Ferman became Vice President of IT - Applications and Data. During this time, he had responsibilities for application and digital transformation, including an SAP implementation and championing Big Data for the corporation. Utilizing his digital transformation experience, he has been a spokesman for Cloudera's data engineering and analysis practices. Mr. Ferman has also served on the advisory board for Oklahoma University's Information Technology Department.



## 2:05-2:40pm

### **Pioneer's DAS/DTS Solution**

#### **Sophie Yi (Pioneer Natural Resources)**

**Description of Presentation:** Hydraulic fracturing stimulation designs are moving towards tighter spaced clusters, longer stage length, and more proppant volumes. However, effectively evaluating the hydraulic fracturing stimulation efficiency remains a challenge. Distributed Acoustic Sensing (DAS) and Distributed Temperature Sensing (DTS), when integrated with the other downhole monitoring techniques including microseismic and downhole pressure gauges, highlight the processes relevant to the completion design, and allow for a better understanding and interpretation of each dataset.

This talk will outline a workflow to improve processing and interpretation of DAS and DTS data. These methods will be demonstrated for a horizontal Wolfcamp well in the Permian Basin. Key aspects of the microseismic, DAS, and DTS results in several fracture stages will be compared to understand the downhole geomechanical processes. A joint interpretation of DAS and downhole gauges data provides more insight about the near-wellbore region fracture complexity. This talk will also present a developed process to quantify near-wellbore tortuosity, where machine learning (ML) algorithms were utilized to estimate the friction pressure induced by near-wellbore tortuosity.

**Short Biography:** Sophie Yi is a Completions Engineer II at Pioneer Natural Resources based in Irving, Texas, where she is involved in completion optimization, pressure transient and rate transient analysis. She has published more than 6 technical papers related to fracture modeling and completion optimization in SPE journals and conference proceedings. Yi holds a PhD degree in Petroleum Engineering from The University of Texas at Austin, and a BS degree in Chemical Engineering from Tsinghua University.



## 2:40-3:00pm

### **Afternoon Break**



## 3:00-3:35pm

### **OSDU, A Business Transformation Movement**

#### **Ron Clymer (EPAM Systems)**

**Description of Presentation:** The OSDU forum has a unique opportunity to introduce not only a functional open API standard and a reference implementation, but it also has a unique opportunity to revolutionize the way our collective community comes together bring the subsurface domain to a revolution in a way we interoperate amongst not only teams, but teams of companies.



With such a goal in mind, there needs to be a shared vision of prosperity and opportunity for Application Developers, Data Vendors, Service Providers & Operators. As an ecosystem that benefits a select few, will only certainly fail in an economy that requires all of us.

Our vision is to empower Petro technical teams to expand and challenge their full potential. As a forum we work to challenge the boundaries of what is possible as we believe our vision of pushing the limits of innovation can best flourish when the industry comes together to create an open ecosystem of member companies that inherits its vision through lenses of shared economical prosperity from the mutual respect & comradery driven & nurtured by the spirit of the OSDU forum.

Ron Clymer, part of the OMC, OSDU Management Committee, shares a perspective on why OSDU is uniquely positioned to change an industry, and how it plans to accomplish that vision.

**Short Biography:** Ron Clymer has 9 years of upstream oil and gas domain experience, specializing in enterprise subsurface data management, business life cycle, solution development and enterprise capability enablement. He currently serves as a Senior Manager of Business Consulting for EPAM Systems as well as serves on the OSDU Leadership Committee representing service organizations, ISVs and Data Vendors. Ron has previously served as the Subsurface Data Management, Process and Governance Lead at Devon Energy Corporation, where he established the subsurface data management practice, developed a proprietary full life cycle enterprise subsurface master data system, and lead a culture of innovation, integration and collaboration between the engineering, geoscience and reservoir communities. As a member of PPDM and SPWLA, Ron has presented and authored multiple white papers on executing and evolving subsurface capabilities for the enterprise in global upstream forums such as PPDM, PNEC, SPWLA Data & Analytics, and the Landmark Innovation Forum(LIFE).

Ron holds a Bachelor of Fine Arts from the University of Oklahoma

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3:35-4:10pm

Data Management & Requirements for Machine Learning in Oilfield Operations

Ron Frohock (OspreyData)

Description of Presentation: 1. Background a. Current state of Machine Learning (ML) in Oil & Gas b. Common Pitfalls of Data Management for ML i. Challenges in Collection, Delivery, Real-Time Ability 2. Objective a. Uses of ML in Oilfield and specifically Artificial Lift b. Event Detection and Well Optimization along with Associated Production / Value 3. Data Management and Requirements a. Different Data for Different Lift Types b. Reference Data i. Equipment Design and Configuration including Historic Retention ii. Document Management c. Asset History Data i. Importance of Knowledge Management, Well/Asset Configuration History, Event Logging and Work Order Tracking, d. Sensor/SCADA Data i. Timeliness, Completeness, Consistency, Frequency, Retention, Telemetry/Connectivity, Quality Metrics ii. Data Access and Storage e. Workflow/Escalation/Logging Process i. How to Make Data Actionable f. Human / Data Interaction i. How to Track Actions so They Turn Back into Data 4. Real World Use Cases a. Examples of Successes and Challenges In Using Existing Data to Build ML Models b. Lessons Learned 5. Interactive Discussion of Lessons Learned from Audience 6. Conclusions



Short Biography: Ron Frohock, CTO: Ron brings over 20 years experience leading in technology and software development, including serving as First VP at JPMorgan Chase and as CTO at SourceThought, where he innovated data shaping solutions for analytics. Ron has an incredible grasp on the needs of the industry and his skills have served us incredibly as he leads our development team in building the OspreyData platform.

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*4:10-4:30pm*

**Closing Remarks**

**Trudy Curtis (PPDM Association)**

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