



Société pour l'Avancement de l'Interprétation des Diagraphies
Section française de la SPWLA "Society of Petrophysicists and Well Log Analysts"

S.A.I.D. TECHNICAL SESSION:

SUBJECT:
**AN INTRODUCTION TO BIG DATA & MACHINE
LEARNING in PETROPHYSICS**

Wednesday 15th of November 2017: 16h00 -19h30

*Auditorium Le Palatin - Office Schlumberger
1, cours du Triangle, 92936 La Défense Cedex
(Access map below)*

Free admission. Mandatory registration by email to :

president@la-said.org

Possibility to follow the meeting via a Web Lync through the same registration.
Specify your name, company, job, email and telephone to get an invitation.

16:00 – 16:30 Welcome, Introduction

16:30 – 17:00 Use and applicability of machine learning to formation evaluation
Emmanuel CAROLI, Total

17:00 – 17:30 Partial log reconstruction using Machine Learning
Valérian GUILLOT, Schlumberger

17:30 – 18:00 *Coffee break*

18:00– 18:30 Marker recognition and validation from machine learning and analytics
Heloise BEURDOUCHE, Schlumberger

18:30 – 19:00 Other topic from service / oil company
TBC

19:00 – 19:15 Conclusion and discussions

AN INTRODUCTION TO BIG DATA & MACHINE LEARNING in PETROPHYSICS

Use and applicability of machine learning to formation evaluation

Emmanuel CAROLI, Total

Fast screening of a large number of wells (hundreds or thousands) is always a challenge but remains a real game changer for data rooms or DRO (Discovered Resources Opportunities). Classical deterministic approaches based on physics are generally time consuming and do not ensure that all interpretation scenarios have been envisaged. Deep learning can be a solution: a large data base including raw and processed data over a wide range of geological contexts has been tested with a neural network approach. Results compare well with classical deterministic outputs provided the training phase could mitigate some pitfalls such as database representativeness, minimum required training dataset or processing constrains.

Emmanuel is graduated from Ecole Normale Supérieure, Ecole des Mines and IFP. He joined TOTAL in 2003. Appointed abroad in Netherland, Argentina and Angola, he has been petrophysicist for 13 years and is now senior specialist in formation evaluation, in charge of an R&D project on petrophysics. His domains of interest are log modeling, fluid characterization and new interpretation methods. He is SAID president since June 2017.

Partial log reconstruction using Machine Learning

Valérien GUILLOT, Schlumberger

Logs can be impacted by bad hole or measurement issues on some depths only. The remaining part of the logs, the good values, contains valid information on the geology of the borehole that can be used with Machine Learning to guess what would have been log values in the bad hole areas and correct the logs. Using nearby wells, even more information can be used by the model to learn so that it predicts log values in the bad hole sections.

Markers recognition and validation using Data Analytics & Machine Learning

Heloise BEURDOUCHE, Schlumberger

Geologists have often to re-pick markers, either because existing ones are not consistent, partially missing or naming of the same markers are different based on people or company history. Using all existing markers available and data analytics algorithms it is possible to identify markers that are identical but have different names or markers which are supposed to show the same formation but aren't actually located at the right depth. Then machine learning can be used to guess the depth of the wrong or missing markers in multi-well context.

Other topic from service / oil company

TBC

Abstract

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