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February 19, 2020

Elevation 66 Tavern at 7PM

10082 San Pablo Ave, El Cerrito, CA 94530

**Multiphysics data integration and the use of Predictive
Analytics in Oil and Gas Exploration**

Abstract: Qualitative multiphysics data integration has a long history in the oil and gas industry. With advances in computing power, quantitative methods of combining data through inversion have become more common. In this talk I will first provide a brief introduction to six different classifications of multiphysics data integration methods with examples from the literature on how the techniques are used. Note that developments in machine learning (ML) techniques are in their infancy with only a few examples published to date. I will provide a description of a one of these ML algorithms that has been applied to multiphysics integration, a predictive analytics technique known as the Method of Alternating Conditional Expectations (ACE). ACE is a supervised ML technique that was implemented for assimilating geophysical and other geo-data types to produce maps of high versus low expected recovery. Because of the lower resolution geophysical and geospatial data

that were employed, the ACE results were used to guide where to conduct higher resolution follow up geophysical surveys rather than to make drilling decisions. After a general explanation on how ACE works, two case histories will be provided from onshore US. In addition to descriptions of the data that were used and the results of the processing, cross validation checks will be provided to assess the levels of confidence that can be applied to the results.

Speaker Bio:



David completed an undergraduate degree in Geological Sciences at San Diego State, followed by graduate work in EM geophysics at UC Berkeley where he received in Phd in 1993. His first post-graduate job was at Sandia National Laboratories where he was the co-architect of one of the first 3D EM forward-modeling and inversion algorithms that made use of massively parallel computing platforms. This was followed by a four year stint as a professor in the Geological Engineering Program at the University of Wisconsin, David returned to Berkeley, California where he took a position at Schlumberger's EMI Technology Center and his work focused on commercializing his PhD project in cross-well EM imaging. Davis joined Lawrence Berkeley Lab as a staff scientist in 2019. There he has continued to focus on the incorporation of EM geophysical techniques into subsurface-characterization workflows, as well as promote multi-physics data analysis using traditional and machine learning techniques.

After the talk: Drinks and discussion TBD