BIG DATA AND ANALYTICS – MORE FOR LESS IN THE OIL AND GAS INDUSTRY?

Paradigm-changing successes of data science abound in social communication, marketing, finance, health care and other sectors of the economy dealing primarily with transactions between people. In the hard-core science and engineering disciplines the prevailing mantra is still "deterministic physics based modeling". The oil and gas sector is no exception. In this presentation, we will show how data science, data analytics and machine learning can impact these domains. Where the physics is poorly understood (we have lots of observations but no reliable set of equations) or where the uncertainty is large (we have lots of observations and reliable equations, but many uncertain model parameters), data-driven methods can replace physics modeling. A few selected applications using methods such as decision trees, neural networks and support vector machines in place of systems of differential or integral equations will serve as demonstrations of the power of the data-driven approach to science and engineering problems.

Bio: Detlef holds a Master's degree in chemistry from Technical University of Munich and a Ph.D. in theoretical physics from Technical University of Aachen (Germany). Before joining Shell in 1997, he was senior staff member at the largest German National Laboratory Forschungszentrum Jülich and involved in founding what is now the John-von-Neumann Institute for Computing. He spent 2 years as postdoctoral researcher at the University of Illinois (National Center for Supercomputing Applications). Detlef executed and managed many projects in data science, computational materials science, geoscience and petroleum engineering in Shell. He is now General Manager for Computation and Modeling in Shell Research, with data science R&D and applications being the fastest growing part of his project portfolio. Detlef is adjunct professor at both University of Houston and Rice University.