Mining Subsurface Data With Dimensional Analysis

The uncertainties of subsurface data lead to a significant variation in project performance because of the unique characteristics and interdependence of measurements, interpretations, and applications. This seminar will discuss the characteristics of subsurface data from which models are derived. Usually, we directly mine the raw attributes of subsurface dataset, and the resulting model is hypercomprehesive and complicated, which significantly reduces its applicability. In this seminar, we will discuss an alternative mining approach to bridge the physics of the problem with the mathematics/statistics of data using dimensionless variables from dimensional analysis. As examples, we will show how to predict the flow patterns of a multi-phase flow system and how to predict water flooding recovery.

Bio

SPE member since 2000, Dr. Xingru Wu is an associate professor at the University of Oklahoma(OU). His research interests include data analytics, reservoir mechanism modeling and simulation, production engineering, and surveillance technologies. He has published 80+ papers in journals and conference proceedings in the interested research areas. Before joining OU, He worked as a petroleum engineer at BP and CNOOC for seven and three years, respectively. He obtained Ph.D. from the University of Texas at Austin in 2006, an M.Sc. from the University of Alaska Fairbanks in 2002, a B.Sc. from China University of Petroleum (East China) in 1997, and all degrees are petroleum engineering. He served as an SPE Distinguished Lecturer in 2020-2021.

