

UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING
Department of Civil & Environmental Engineering

CIVE 6111 Graduate Seminar Series

Xiaowei Weng

Modeling of complex hydraulic fractures in naturally fractured formation

Friday, December 2, 2016

2:45 pm – 3:45pm

Classroom Business Building, 120

Abstract: Hydraulic fracturing in shale gas reservoirs has often resulted in complex fracture network growth, as evidenced by microseismic monitoring. The nature and degree of fracture complexity are strongly dependent upon the pre-existing natural fractures in the formation and in-situ stress conditions. Simulating complex fractures growth in these formations is very challenging. There are limited few models available to simulate this complex process despite strong industry need for such models to improve the ability to predict and optimize fracture design and completion practices in the unconventional reservoirs.

A Unconventional Fracture Model (UFM) had been developed recently in Schlumberger that is capable of simulating complex fracture network propagation in a formation with pre-existing natural fractures. The model solves a system of equations governing fracture deformation, fracture propagation, height growth, fluid flow, and proppant transport in a complex fracture networks. This talk gives an overview of the UFM model and some recent development in extending the Pseudo-3D model framework using a Stacked Height Growth model to overcome the P3D limitations to more accurately predict fracture height growth and to simulate fracture growth in formation with layers of different natural fracture distributions. A few field examples and examples showing the comparison of the Stacked Height Growth model with the fully 3D Planar3D model will be presented.

About the speaker:



Xiaowei Weng is an Advisor in Hydraulic Fracture Modeling with Schlumberger, and Project Manager of Modeling and Mechanics in the Pressure Pumping and Chemistry Product Center based in Sugar Land, Texas. He received his MS and PhD degrees in Engineering Mechanics from the University of Texas at Austin. He has 26 years of industry experience, 9 years with ARCO E&P Technology, and 17 years with Schlumberger. He has engaged in the research and simulation model development in hydraulic fracturing, acid fracturing, multi-fractured horizontal well completion and production, wellbore hydraulics, coiled tubing cleanout and DTS inversion. He is a member of SPE and ARMA and authored and co-authored over 40 technical papers.