

UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING

Department of Civil & Environmental Engineering

CIVE 6111 Graduate Seminar

Gregory R. Miller, PhD

Professor and Chair of Civil & Environmental Engineering
University of Washington

Landslide, Debris Flow, and Tsunami Effects on Structures: A Modeling Tale

Friday, March 10, 2017

2:45 pm - 3:45 pm

CBB 120

Abstract: This talk will combine an overview of landslide, debris flow, and tsunami phenomena (both mechanics and effects) with a general consideration of ways to model such challenging multiphase flows and interactions in structural engineering contexts. This will lead to a more detailed discussion of the application of the Material Point Method to this class of problems. The Material Point Method is based on both Lagrangian and Eulerian principles such that it is well-suited for capturing large, flow-like deformations of history dependent materials, but it can also handle traditional solids problems and fluids problems. Of course, no analysis approach is magic, and so both the strengths and weaknesses of the method will be demonstrated in various relevant contexts.

A series of application examples of varying complexity will be used to show the range and nature of the modeling results it is possible to obtain with these methods. This will illustrate the accuracy of the results relative to experimental measurements and/or other analyses, and also provide a general sense of the quantities of interest to scientists studying these phenomena and engineers designing to mitigate their effects.

About the speaker:



Greg Miller is a professor in the Department of Civil and Environmental Engineering at the University of Washington in Seattle. He received his BSCE from the University of Washington, and then went on to earn his MSCE and PhD degrees from Northwestern University in Evanston, Illinois, returning to the University of Washington as a faculty member at the end of 1983. During his career he has had a number of campus and national leadership roles, serving most recently as Chair of Civil and Environmental Engineering, and currently transitioning into a new role as Vice Dean for the College of Engineering.

His research and instruction have focused primarily in the areas of applied mechanics and computational methods, with applications including structures, geotechnical systems, and transportation infrastructure. His technical expertise centers primarily around numerical methods, data analytics, and software development, and he and his graduate students have produced several software packages that have been widely used in both commercial and educational contexts.

He has received various awards both for research and for education, most notably a National Science Foundation Presidential Young Investigator Award in 1987 and a University of Washington Distinguished Teaching Award in 1994.