

T.T. SOONG STUDENT LECTURE SERIES

The "T. T. Soong Student Lecture Series" recognizes Prof. Soong's outstanding research accomplishments and contributions to the field of structural and earthquake engineering over the course of his 48-year career at the University at Buffalo.

Soil-Structure Interaction Effects of Building Clusters During Earthquakes

Abstract

This talk will deal with the response of a simple class of building clusters during earthquakes, their effect on the ground motion, and how individual buildings within the cluster interact with the soil and with each other. In order to study this problem it is necessary to first simulate the free-field earthquake ground motion and then incorporate this ground motion as input to the domain that includes the building structures. To this effect, I will describe Hercules, a parallel octree-based finite element code developed by the Quake Group at CMU for modeling the kinematic source, wave propagation path and local site effects, and the Domain Reduction Method (DRM), our methodology for incorporating the incoming seismic motion into the analysis of the earthquake response of civil infrastructure in a localized region. As an application, I will then show results of a simulation of the ground motion during the 1994 earthquake and focus on the coupled response of a set of idealized building models located within the San Fernando Valley.

Jacobo Bielak

University Professor of Carnegie Mellon University, PA

Professor Jacobo Bielak received his Civil Engineer's degree from the National University of Mexico, MS from Rice University, and Ph.D. from Caltech. He joined Carnegie Mellon University in 1978 where he is now a University Professor. His research is in the area of computational mechanics with special emphasis on earthquake engineering and engineering seismology. The main objective of his research is to contribute to the understanding of earthquake-related phenomena, in an end-to-end approach, with the ultimate goal of mitigating the impact that earthquake events can have on complex infrastructure systems.



He was a member of the original ATC committee that drafted the first tentative seismic provisions for soil-structure interaction, which are now, in modified form, part of the NEHRP seismic provisions. Recognition for his work includes the Gordon Bell Prize for Special Accomplishments Based on Innovation. He is a member of the Mexican Academy of Engineering, the Mexican Academy of

Sciences, a Distinguished Member of ASCE, and a member of the U.S. National Academy of Engineering.

Date: Friday, March 22, 2013 **Time:** 2:00 PM – 3:30 PM

Location: 140 Ketter Hall, North Campus, University at Buffalo

Webcast: <http://civil.eng.buffalo.edu/webcast>

Technical Questions: seeslwebcast@gmail.com

Refreshments will be served!



Organized by the Student Chapter of EERI at UB, CSEE-GSA, MCEER, Dept. of CSEE and NEES