# Graduate Seminar/Distinguished ADVANCE Lecture

## "Sensor Networks, Data Interpretation, and Large Scale Simulation"

by
Professor Ahmed Elgamal
University of California at San Diego

March 4, 2009
4:00 p.m.
Rathbone 1052

**Abstract**

Information Technologies (IT) are increasingly allowing for advances in monitoring and analysis of structural response. Sensor networks provide real-time data streams, as a basis for system identification and decision-support applications. Large-scale testing facilities worldwide are generating major valuable datasets and insights for earthquake engineering applications. In each experiment, hundreds of sensors record salient features of the involved response, providing new horizons for the development and calibration of high-fidelity computational simulation tools. Such datasets along with high-performance parallel computing environments are permitting the evolution of insights, gained from analyses of entire ground-foundation-structural systems. Recently conducted representative research efforts will be presented, addressing large Bridge Systems and Wind Turbines.

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Ahmed Elgamal
Chaired the Department of Structural Engineering from 2003 to 2007. In 1984, he received his Ph.D. from Princeton University. He joined UC San Diego in 1997 as Professor after a post-doctoral appointment at the California Institute of Technology (1985-86), and faculty positions at Rensselaer Polytechnic Institute (1986-96) and Columbia University (1996-97). He served (2006-2007) as Principal Investigator of the NSF Network for Earthquake Engineering IT project (NEESit, http://it.nees.org), as a Thrust Area Leader (2001-2007) of the Pacific Earthquake Engineering Research (PEER http://peer.berkeley.edu/) Center, and as Technical Director (1991-1996) of the Rensselaer Geotechnical Centrifuge Research Center (http://nees.rpi.edu). His areas of research interest include large-scale soil-structure experimental and computational simulation of liquefaction and related mitigation approaches, Information Technology (IT) applications in Civil Engineering research and education, and interpretation of recorded seismic response through system-identification and data mining procedures. Incorporation of IT into structural engineering is currently among his main research areas, with emphasis on Health Monitoring of Structures and Earthquake Engineering. Internet applications include sensor networks for monitoring our civil infrastructure, with real-time condition assessment and decision-making algorithms (http://healthmonitoring.ucsd.edu). Integration of research and education with live web-accessible computations and experiments is also a main focus (http://webshaker.ucsd.edu, http://cyclic.ucsd.edu, and http://cyclic.ucsd.edu/openseespl). He is author and co-author of over 250 Technical Publications.