

Lambros Katafygiotis, Ph.D.

SEMINAR I: Reliability Analysis of Linear Dynamical Systems

This talk will focus on the calculation of the reliability of linear dynamical systems subjected to Gaussian random excitations. We consider the general case where the limit state function is a function of several response quantities rather than a single one. It is noted that such dynamic reliability problems usually involve a very large number of random variables (of the order of hundred or thousand). A new method developed by the speaker, referred to as Domain Decomposition Method, will be presented. It is shown with numerical examples that the method is extremely efficient and accurate.

SEMINAR II: Reliability Analysis of Nonlinear Dynamical Systems

Here we address the most interesting and challenging problem of calculating the reliability of a nonlinear dynamical system subjected to Gaussian random excitation. Monte Carlo Simulations (MCS) is the most commonly used method to solve such problem. However, while MCS are robust they are also computationally very demanding. Herein we explore a set of alternative efficient methodologies. The main result in this seminar is a new methodology developed by the speaker, referred to as Auxiliary Domain Method, which offers accurate solution to the problem at a fraction of the computational cost required by MCS or other available methods.

Speaker

Prof. Lambros Katafygiotis received his Diploma in Civil Engineering from the National Technical University of Athens, Greece, and his MS and Ph.D. in Civil Engineering from the California Institute of Technology (1991). Currently he is Associate Professor of Civil Engineering at the Hong Kong University of Science and Technology. His research interests lie in the areas of computational mechanics and structural dynamics. He has published over one hundred journal and conference papers. In 2001 he received the Research Prize in the area of System Identification awarded by the International Association for Structural Safety and Reliability (IASSAR).