

**DEPARTMENT OF COMPUTER SCIENCE  
UNIVERSITY OF HOUSTON  
SPRING SEMINAR 2012**

**WHEN:** FRIDAY, JANUARY 27, 2012  
**WHERE:** PGH 232  
**TIME:** 10:00 AM (Please note time)

**SPEAKER:** Dr. Miloš Kojić, The Methodist Hospital Research Institute

Host: Dr. Marc Garbey

**TITLE:** Computational Models of Molecular and Nanoparticle Transport in Tissues and Capillaries

**Abstract**

Transport of matter in biological systems represents the vital and most important process. The transport occurs in different scales, spanning from the atomic to macroscale. It is very complex since it involves both biochemical and mechanical sources. Modeling remains a challenge due to this complexity. In this presentation we refer to the following specific topics: transport of distributed biological constituents related to plaque formation and growth, transport of solid bodies by fluid, and diffusion in complex media. Those are the topics on which the research has been performed at The Methodist Hospital Research Institute, Houston; and at Metropolitan University, Belgrade – R & D Center for Bioengineering, Kragujevac, Serbia. Models of plaque formation and growth rely on the convective transport and diffusion-reaction equations, while transport of rigid and deformable solids within fluid is modeled by a remshing procedure. In diffusion within complex media a hierarchical modeling approach (introduced for simulation of diffusion within nanochannels) is used. It accounts for interface effects between solid phase and transported molecules, and couples MD and FE method. Here, a generalization of the hierarchical approach is proposed for diffusion in composite media.

**BIO:** Dr. Milos Kojic received his Ph.D. in mechanical engineering in 1972 at Rice University. He is the Founder and PI of a general purpose finite element program PAK for linear and nonlinear analysis of solids and structures, fluid mechanics, mass and heat transfer, biomechanics and coupled and multiscale problems. Dr. Kojic is currently the senior member at The Methodist Research Institute in the Department of Nanomedicine.