

STOCHASTIC SIMULATION: FROM FUNDAMENTAL SCHEME TO PRACTICAL APPLICATIONS IN ENGINEERING AND BIOMECHANICS

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NAOKI TAKANO^{*}, VITTORIO SANSALONE[†]
AND TETSUYA MATSUDA[§]

^{*} Department of Mechanical Engineering, Keio University
3-14-1 Hiyoshi, Kohoku-ku, Yokohama 223-8522, Japan
naoki@mech.keio.ac.jp, <http://www.takano-lab.jp/>

[†]Laboratoire Modélisation et Simulation Multi Echelle (MSME UMR 8208 CNRS)
Université Paris-Est Créteil Val de Marne
61, avenue du General de Gaulle – 94010 Créteil Cedex, Paris, France
vittorio.sansalone@u-pec.fr

[§]Department of Engineering Mechanics and Energy, University of Tsukuba
1-1-1 Tennodai, Tsukuba 305-8573, Japan
matsuda@kz.tsukuba.ac.jp

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ABSTRACT

Many studies have been carried out on the stochastic/probabilistic computational method using finite element method (FEM) or discrete element method (DEM) for solid mechanics simulation. However, the uncertainty quantification or uncertainty propagation in the nonlinear problems should be discussed furthermore. This MS would like to welcome the research works on not only the fundamental numerical scheme for stochastic/probabilistic simulation but also the uncertainty modelling in practical applications.

One of the applications is the biomechanics including the inter-individual differences. Also, many uncertainties due to the lack of measured data exist in the biomechanics simulation.

Another application is the advanced engineering materials such as the fibre reinforced composite materials or porous materials. The variability or uncertainty due to the fabrication process can be seen also, for instance, in the additive manufacturing or 3D printing. Any type of material and manufacturing process is welcome to this MS related to the uncertainty modelling and stochastic prediction. If 3D printed product is for patient-specific medical implant, the variability becomes a critical problem for its quality assurance.

Finally, the topic is not limited to the mechanical engineering or biomedical engineering simulation, and other research work in the civil engineering field is also welcome.