

## Editorial

Computational mechanics is a major sub-set of computational science and engineering and is concerned with the use of computational methods to simulate physical events and engineering systems governed by the basic laws of mechanics, together with adequate constitutive equations for the fluids and solids involved. Today, computational mechanics has established itself as an important tool in engineering analysis and design, thus bridges the gap between theoretical mechanics and industrial needs. In some branches, computational mechanics is used only to provide qualitative information on certain mechanical aspects, whereas computational mechanics has partially displaced expensive laboratory testing in other branches.

The purpose of this special issue is to report original research in those areas of computational mechanics that involve and enrich the rational application of mechanics, mathematics, and numerical methods in the practice of modern engineering. The scope of the research reported in this special issue includes theoretical and computational methods, and their application in solid and structural mechanics, multi-body system dynamics, fluid mechanics, fluid-structure interactions, fracture mechanics and structural integrity, multiscale mechanics and mesh-free methods, transport phenomena and heat transfer, modern variational methods in mechanics etc.

This special issue contains fourteen papers that focus on diverse aspects of computational mechanics as defined in the scope of this special issue. The first paper reports a numerical investigation of turbulent jet flows. The second paper considers molecular dynamics simulation of epoxy resin for determination of adhesion strength. The third paper develops a boundary element method for the nonlinear analysis of shear deformable beam-columns partially supported on tensionless Winkler foundation, undergoing moderate large deflections under general boundary conditions. The fourth paper uses finite element method for bending analysis of discretely delaminated composite conoidal shell roofs under concentrated load. The fifth paper deals with the finite element modeling of saturated low-cycle fatigue and the cyclic hardening phenomena of different grades of steel. The sixth paper deals with finite element analysis of the soil-structure systems considering the coupled effect of elastic structure and materially nonlinear soil. The seventh paper deals with large deflection static behaviour of thin isotropic skew plates under uniformly distributed load for various mixed flexural boundary conditions. Large amplitude forced vibration behaviour of cross-beam system under harmonic excitation incorporating the effect of geometric non-linearity has been reported in paper number eight. The ninth paper reports a parametric study on buckling behaviour of thin stainless steel cylindrical shells for circular dent dimensional variations under uniform axial compression. The tenth paper deals with the mean value first order second moment analysis of buckling of axially loaded thin plates with random geometrical imperfections. The next paper simulates a laser bending problem where the deformation of a circular plate, subjected to a circular irradiation path, is studied through a sequentially coupled thermo-mechanical elasto-plastic simulation by finite element method. In the twelfth paper, a three-dimensional finite element thermal model is developed to simulate the laser transmission welding process. A semi-analytical model taking into account the static deflection due to large DC bias voltages has been used to study the squeeze film damping characteristics of cantilever micro-resonator in the next paper. The last paper investigates the growth of elastic-plastic front in rotating solid disks of non-uniform thickness through an extension of a variational method in elasto-plastic regime. These papers will be, we believe, very useful to the researchers and academicians, but not limited to, in carrying out research and development in the relevant fields.

As guest editors of this special issue on “*Computational Mechanics*” for the *International Journal of Engineering, Science and Technology (IJEST)*, we would like to thank all the authors for submission of their research findings for publication in this special issue, all the reviewers for providing professional evaluation of the manuscripts in a timely manner and without compensation and the Editor, IJEST for encouragement and help at different stages.

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