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Preface for the special issue: modeling, optimization and simulation

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Growing importance and usefulness of Industry Academia collaborative research clearly drive the focus on Mathematical Modeling, Optimization and Numerical Simulation today. This Special Issue is the beginning of bringing out a wide spectrum of fine fresh thoughts by some of the esteemed researchers in their respective field of specializations and the challenges therein.

- Optimization and simulation of nonwoven textile production is a challenging problem and the underlying mathematical approach presented here is more rigor and interesting.
- Scaled and fractional Brownian motion through p-variational statistics in order to understand the discriminating measure is a novel idea.
- Special type of fractal interpolation functions with the quality of shape preserving showcase its need in various applications.
- A finite element analysis for the general coupled system of elliptic equations through weighted extended B-Spline put forth the direction of a generic mathematical approach for such class of problems.
- An optimized numerical scheme based on a meshfree particle method (finite pointset method) for a "vision based" pedestrian dynamics simulation is another new direction of thought and shows how the numerical simulation close to the reality.
- In general, the problem of uncertainty quantifications is more complex. Intrusive methods in uncertainty quantifications relating to kinetic theory makes interesting and opens up new mathematical questions.
- Modeling and simulation of ultrasonic beam skewing in polycrystalline materials is another direct industrial problem with a good mathematical flavor.
- Two dimensional and three dimensional Cahn–Hilliard equations numerically solved through the higher order spectral element scheme underline the requirement of such approach.
- Fractional order diffusion and wave equations are hard to solve including setting a sound numerical technique. A spectral Galerkin method for these fractional order equations is a new attempt and brings out how the known well proven methods can be extended to handle such mathematical problems.

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