INVERSE AND OPTIMIZATION PROBLEMS FOR ADVANCED MATERIALS

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MINISYMPOSIUM

This mini-symposium will emphasize a range of analytical, computational and experimental approaches, which can be applied to the solution of inverse and optimization problems in science and engineering [1-4]. Contributions dealing with practical applications are encouraged, such as in mechanics, civil engineering, aeronautics, bio-medicine, transport and sensing of pollutants, materials design and processing, remote sensing, non-destructive evaluation, meta-models for high-dimensional problems, deep learning algorithms, etc. The following list covers some of the topics to be presented at this mini-symposium. Papers on other subjects related to the themes of this symposium are also welcome.

Ø **Inverse Problems**: Mechanics, Aeronautics, Vehicle engineering, Civil engineering, Material science, Damage detection, Fault diagnosis, Heat and mass transfer, Acoustics, Imaging, Bio-medicine, Electromagnetism, Geophysics, Transport and sensing of pollutants, Non-destructive evaluation, etc.

Ø **Numerical Algorithms**: Ill-posedness analysis and Regularization techniques, Semi-inverse problems and methods, Large-scaled inverse problems, Sensitivity analysis, Evolutionary algorithms, Geometric problems, Determination of boundary and initial conditions, Dynamic load identification, etc.

Ø **Optimization Design**: Design sensitivity analysis and global optimization, Shape and topology Optimization, Meta-models for high-dimensional problems, etc.

Ø **Data-driven Based Algorithms**: Data analysis, Signal and noise processing, Pattern recognition, Identification based on machine learning, Deep learning algorithms, Data assimilation methods, Machine learning based optimization, etc.