



Inverse and Crack Identification Problems in Engineering Mechanics (Hardback)

By Georgios E. Stavroulakis

Kluwer Academic Publishers, United States, 2000. Hardback. Book Condition: New. 2001 ed.. 235 x 155 mm. Language: English . Brand New Book ***** Print on Demand *****.Inverse and crack identification problems are of paramount importance for health monitoring and quality control purposes arising in critical applications in civil, aeronautical, nuclear, and general mechanical engineering. Mathematical modeling and the numerical study of these problems require high competence in computational mechanics and applied optimization. This is the first monograph which provides the reader with all the necessary information. Delicate computational mechanics modeling, including nonsmooth unilateral contact effects, is done using boundary element techniques, which have a certain advantage for the construction of parametrized mechanical models. Both elastostatic and harmonic or transient dynamic problems are considered. The inverse problems are formulated as output error minimization problems and they are theoretically studied as a bilevel optimization problem, also known as a mathematical problem with equilibrium constraints. Beyond classical numerical optimization, soft computing tools (neural networks and genetic algorithms) and filter algorithms are used for the numerical solution. The book provides all the required material for the mathematical and numerical modeling of crack identification testing procedures in statics and dynamics and includes several thoroughly discussed...



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