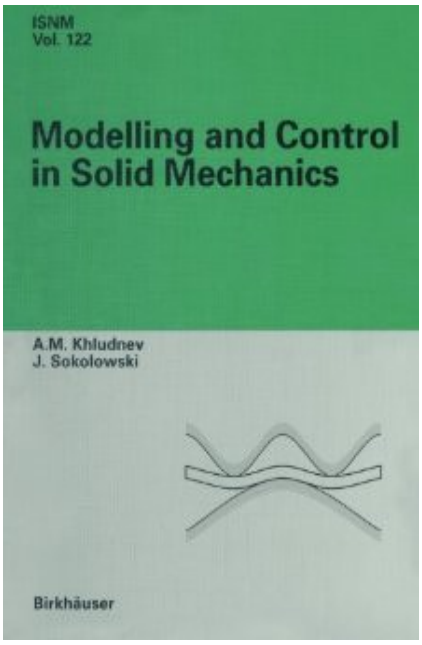

Modelling and Control in Solid Mechanics (International Series of Numerical Mathematics)

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This book covers the boundary value problems for a wide range of mathematical models of the mechanics of deformable bodies, in particular, the boundary value problems concerning plates and shells, crack theory, and elastoplastic bodies. An essential feature of the discussed boundary value problems is the availability of the inequality type constraints imposed on solutions such as the impenetration condition for contact problems, the yield plasticity condition, etc. As a consequence, the presence of free boundaries is typical of the boundary value problems concerned. The objective of the book is to display some new methods of analyzing such problems, as well as to perform research on new models evolved from engineering practice. Readers will find a variety of new mathematical models describing some contact problems for plates and shells, an equilibrium of plates involving cracks, etc. Furthermore, some new mathematical methods are presented which were specially developed by the authors to study the problems concerned. These help to convey a comprehensive picture of the present state of mathematical problems on the free-boundary elasticity and plasticity theory. The book is intended for postgraduates, scientists and engineers, and for students interested in problems of modelling and optimal control in the mechanics of deformable bodies.