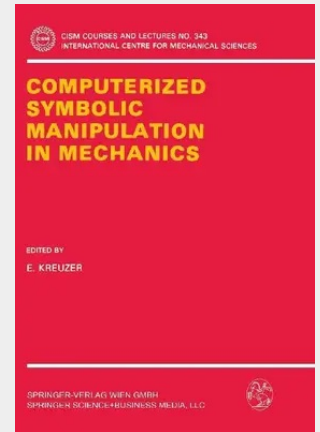


Computerized Symbolic Manipulation in Mechanics

The aim of this book is to present important software tools, basic concepts, methods, and highly sophisticated applications of computerized symbolic manipulation to mechanics problems. An overview about general-purpose symbolic software is followed by general guidelines how to develop and implement high-quality computer algebra code. The theoretical background including modeling techniques for mechanical systems is provided which allows for the computer aided generation of the symbolic equation of motion for multibody systems. It is shown how the governing equations for different types of problems in structural mechanics can be automatically derived and how to implement finite element techniques via computer algebra software. Perturbation methods as a very powerful approach for nonlinear problems are discussed in detail and are demonstrated for a number of applications. The applications covered in this book represent some of the most advanced topics in the rapidly growing field of research on symbolic computation.

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