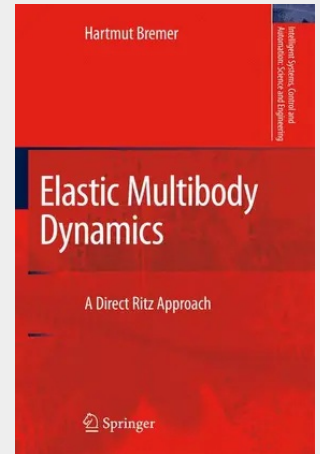


Elastic Multibody Dynamics

A Direct Ritz Approach

1. Background This textbook is an introduction to and exploration of a number of core topics in the field of applied mechanics. Mechanics, in both its theoretical and applied contexts, is, like all scientific endeavors, a human construct. It reflects the personalities, thoughts, errors, and successes of its creators. We therefore provide some personal information about each of these individuals when their names arise for the first time in this book. This should enable the reader to piece together a cultural-historical picture of the field's origins and development. This does not mean that we are writing history. Nevertheless, some remarks putting individuals and ideas in context are necessary in order to make clear what we are speaking about – and what we are not speaking about. At the end of the 19th century, technical universities were established everywhere in Europe in an almost euphoric manner. But the practice of technical mechanics itself, as one of the basics of technical development, was in a desolate state, due largely to the refusal of its practitioners to recognize the influence of kinetics on motion. They were correct to the extent that then current mechanical systems moved with small velocities where kinetics does not play a significant role. But they had failed to keep up with developments in the science underlying their craft and were unable to keep pace with the speeds of such systems as the steam engine.

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