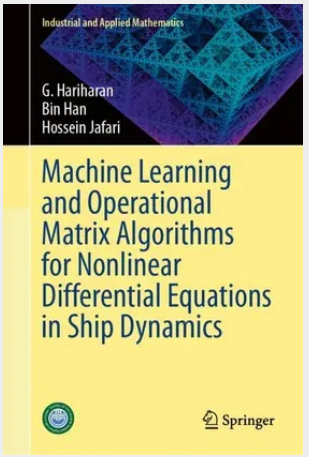
Hariharan / Han / Jafari

Machine Learning and Operational Matrix Algorithms for Nonlinear Differential Equations in Ship Dynamics



This book explores analytical and numerical approximate solutions obtained by operational matrix-based methods for both classical and fractional order differential equations. An important focus of the book is to develop operational matrix methods for solving problems of ship dynamical models and fractional order ship roll motion equations arising in ocean engineering. Also, this book provides comprehensive information on the conceptual basis of operational matrix theory and its applications. It provides an essential balance between mathematical rigor and the practical applications of operational matrix theory. The book is divided into 8 chapters. The first three chapters are devoted to the mathematical foundations and basics of operational matrix algorithms. The remaining chapters provide the machine learning-based operational matrix algorithms for linear, nonlinear and fractional ship dynamical problems. The book is ideally suited as a text for graduate, postgraduate and research students in applied mathematics and computing.

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