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Autore	Eshkabilov Sulaymon L
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Nota di contenuto	Part I: Ordinary Differential Equations -- Chapter 1: Analytical Solutions of Ordinary Differential Equations -- Chapter 2: Numerical Methods for First Order ODEs -- Chapter 3: Numerical Methods for Second Order ODEs -- Chapter 4: Stiff ODEs -- Chapter 5: Higher Order and Coupled ODEs -- Chapter 6: Implicit ODEs -- Chapter 7: Comparative Analysis of ODE Solution Methods -- Part II: Ordinary Differential Equations-Boundary Value Problems -- Chapter 8: Boundary Value Problems --

Part III: Applications of Ordinary Differential Equations -- Chapter 9: Spring-Mass-Damper Systems -- Chapter 10: Electro-Mechanical and Mechanical Systems -- Chapter 11: Trajectory Problems -- Chapter 12: Simulation Problems -- Part IV: Partial Differential Equations -- Chapter 13: Solving Partial Differential Equations.

Sommario/riassunto

Employ the essential and hands-on tools and functions of the MATLAB's ordinary differential equations (ODEs) and partial differential equations (PDEs) packages, which are explained and demonstrated via interactive examples and case studies. This book contains dozens of simulations and solved problems via m-files/scripts and Simulink models which help you to learn programming and modeling of more difficult, complex problems that involve the use of ODEs and PDEs. You'll become efficient with many of the built-in tools and functions of MATLAB/Simulink while solving more complex engineering and scientific computing problems that require and use differential equations. Practical MATLAB Modeling with Simulink explains various practical issues of programming and modelling. After reading and using this book, you'll be proficient at using MATLAB and applying the source code from the book's examples as templates for your own projects in data science or engineering. What You Will Learn How to model more complex problems using MATLAB and Simulink Gain the programming and modeling essentials of MATLAB using ODEs and PDEs How to program and use numerical methods to solve 1st and 2nd order ODEs How to program and solve stiff, higher order, coupled and implicit ODEs How to program and use numerical methods to solve 1st and 2nd order linear PDEs How to program and solve stiff, higher order, coupled and implicit PDEs.