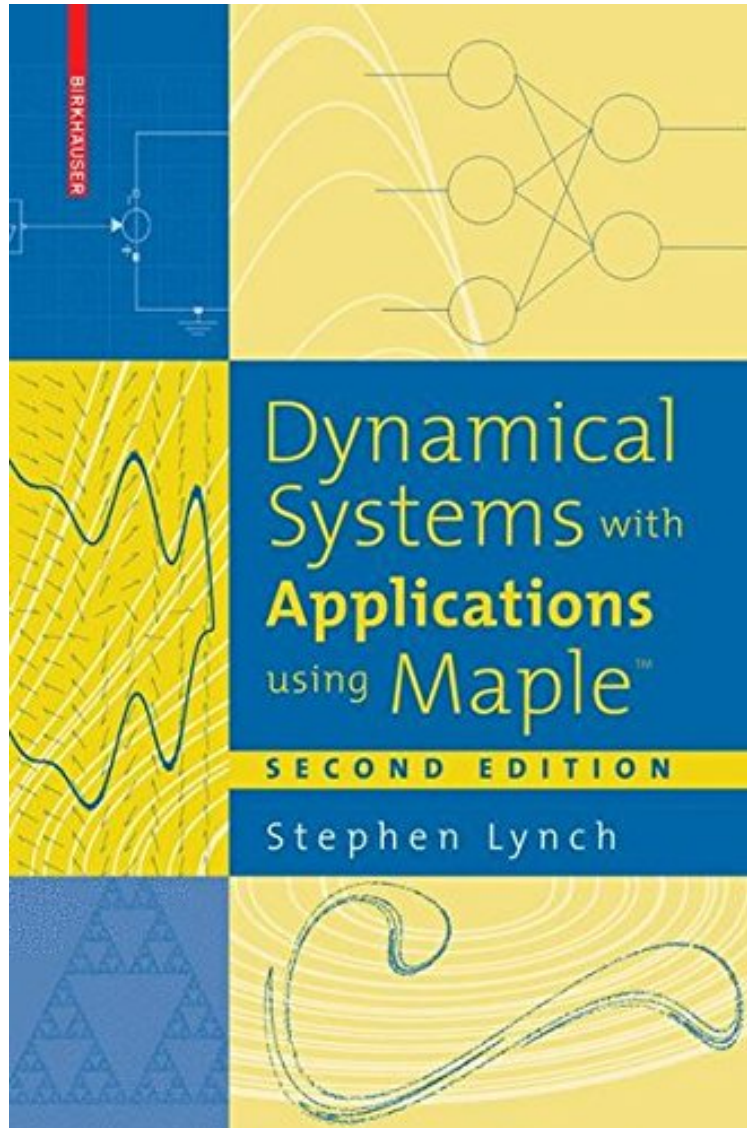


Dynamical Systems with Applications using Maple

Stephen Lynch

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Stephen Lynch : Dynamical Systems with Applications using Maple before purchasing it in order to gage whether or not it would be worth my time, and all praised Dynamical Systems with Applications using Maple:

12 of 14 people found the following review helpful. More informationBy Steve CarlsonThought I'd give a more in depth review than the others here.Most advanced math textbooks contain one or two chapters that turn me off. I must say that every chapter in this book had useful information or very good applications.The opening chapter is a brief introduction to Maple V (some Maple 8 commands are posted on the books website). Note that Maple 9 is now out and no doubt Maple X will soon follow.Chapters 1-7 cover planar systems in some detail, vectorfield in DEplot is a

real winner here. Chapters 8 and 9 cover 3D and nonautonomous systems - the poincare command in Maple is a real time saver. Chapters 10-12 cover a lot of research results on limit cycles - the most lucid I have seen in any textbook. The remaining half of the book concentrates on both real and complex discrete systems. There are the usual cobweb diagrams, bifurcation diagrams and Mandelbrot set. Where this book comes into its own, however, is in Chapters 16-20. Lasers and nonlinear optics are investigated using complex iterative maps. Fractals and even multifractals are discussed in some detail. The book ends with a chapter dedicated to chaos control. Overall, the book is concise with pertinent examples and applications. It is not dogged down with math notation, theorems and proofs. Strogatz, Perko and Allgood are good books to practice more Maple programming techniques. 6 of 8 people found the following review helpful. First-rate! By Mark Siever I did my degree in Micro-Electronics and Computing but I've always been fascinated with chaos theory. This book is easy to read and you do not need to be a pure mathematician to understand the theory involved. I did most of the lower level mathematics in my degree course and it was nice to see it applied to real world problems. The MAPLE code for many of the plots in the book is included at the end of chapters and there is an excellent web-site that allows you to view the figures in color. The MAPLE tutorials given at the beginning of the book should help new users. The Aims and Objectives listed at the beginning of each chapter is a nice touch and there are many interesting exercises for the reader to get their teeth into. Some of the chapters are at an advanced level but the results given there are easy to understand. It was also nice to have recently published research articles in the Bibliography. I would highly recommend this book to anybody interested in chaos, fractals or nonlinear maths in general. I wish a topic like this could have been offered in my degree. Mark Siever BSc (Hons) Micro-Electronics and Computing. 5 of 8 people found the following review helpful. Excellent book! By Customer It is an excellent book for non mathematicians. It is well written and clear, although some knowledge of linear algebra and ordinary differential equations are prerequisites. This book takes the reader from the basic theory through to recently published research material. Additionally, Professor Lynch teaches how to do things with the aid of the Maple algebraic manipulation package. Besides, it includes exercises and their solutions. As far as I know, it is the first book to deal with dynamical systems that has an intelligible approach for non mathematicians. Undoubtedly, it is a valuable book for students and scientists who work with dynamical systems in various branches of knowledge.

Excellent reviews of the first edition (Mathematical Reviews, SIAM, Reviews, UK Nonlinear News, The Maple Reporter) New edition has been thoroughly updated and expanded to include more applications, examples, and exercises, all with solutions Two new chapters on neural networks and simulation have also been added Wide variety of topics covered with applications to many fields, including mechanical systems, chemical kinetics, economics, population dynamics, nonlinear optics, and materials science Accessible to a broad, interdisciplinary audience of readers with a general mathematical background, including senior undergraduates, graduate students, and working scientists in various branches of applied mathematics, the natural sciences, and engineering A hands-on approach is used with Maple as a pedagogical tool throughout; Maple worksheet files are listed at the end of each chapter, and along with commands, programs, and output may be viewed in color at the authors website with additional applications and further links of interest at Maplesofts Application Center

From the reviews of the second edition: "The text treats a remarkable spectrum of topics and has a little for everyone. It can serve as an introduction to many of the topics of dynamical systems, and will help even the most jaded reader, such as this reviewer, enjoy some of the interactive aspects of studying dynamics using Maple." UK Nonlinear News (1st Edition) "This book covers standard material for an introduction to dynamical systems theory. Written for both advanced undergraduates and new postgraduate students, this book is split into two distinctive parts: continuous systems using ordinary differential equations and discrete dynamical systems. Lynch uses the Maple package as a tool throughout the text to help with the understanding of the subject. The book contains over 250 examples and exercises with solutions and takes a hands-on approach. There are over 300 individual figures including about 200 Maple plots, with simple commands and programs listed at the end of each chapter... This publication will provide a solid basis for both research and education in nonlinear dynamical systems." The Maple Reporter (1st Edition) "The book will be useful for all kinds of dynamical systems courses. [It] shows the power of using a computer algebra program to study dynamical systems, and, by giving so many worked examples, provides ample opportunity for experiments. [It] is well written and a pleasure to read, which is helped by its attention to historical background." Mathematical s (1st Edition) "a very nice tutorial on Maple in which quite a few mathematical and graphical commands are illustrated. A student could quickly work through this tutorial and then be ready to do quite a bit with Maple. [The second part of Hilberts 16th problem] is not the topic encountered in most ODE texts, even if the question has been open for 100 years! Lynchs book provides great references, as well as Maple code that could be easily modified by readers who have the tools to quickly engage in quite sophisticated numerical experimentation." SIAM (1st Edition) "A student or scientist, who works through some chapters of the book, learns a good deal about the presented mathematical concepts and possibilities of the symbolic algebra package to assist the researcher in understanding his mathematical model." Dynamical Systems Magazine (1st Edition) This book, that provides an introduction to the study of dynamical systems

with the aid of the algebraic package Maple, is the second edition of the well known classical book of Stephen Lynch . a well written and highly readable introduction to the numerical study dynamical systems with Maple at an introductory level that covers many topics of this subject and can be used as a very valuable resource for many courses in applied mathematics and modelization in engineering and physical sciences. (Manuel Calvo, Zentralblatt MATH, Vol. 1193, 2010)From the Back Cover"The text treats a remarkable spectrum of topics and has a little for everyone. It can serve as an introduction to many of the topics of dynamical systems, and will help even the most jaded reader, such as this reviewer, enjoy some of the interactive aspects of studying dynamics using Maple." UK Nonlinear News (of First Edition) "The book will be useful for all kinds of dynamical systems courses. [It] shows the power of using a computer algebra program to study dynamical systems, and, by giving so many worked examples, provides ample opportunity for experiments. [It] is well written and a pleasure to read, which is helped by its attention to historical background." Mathematical s (of First Edition) Since the first edition of this book was published in 2001, Maple has evolved from Maple V into Maple 13. Accordingly, this new edition has been thoroughly updated and expanded to include more applications, examples, and exercises, all with solutions; two new chapters on neural networks and simulation have also been added. There are also new sections on perturbation methods, normal forms, Grbner bases, and chaos synchronization. The work provides an introduction to the theory of dynamical systems with the aid of Maple. The author has emphasized breadth of coverage rather than fine detail, and theorems with proof are kept to a minimum. Some of the topics treated are scarcely covered elsewhere. Common themes such as bifurcation, bistability, chaos, instability, multistability, and periodicity run through several chapters. The book has a hands-on approach, using Maple as a pedagogical tool throughout. Maple worksheet files are listed at the end of each chapter, and along with commands, programs, and output may be viewed in color at the authors website. Additional applications and further links of interest may be found at Maplesofts Application Center. Dynamical Systems with Applications using Maple is aimed at senior undergraduates, graduate students, and working scientists in various branches of applied mathematics, the natural sciences, and engineering. ISBN 978-0-8176-4389-8 Also by the author: Dynamical Systems with Applications using MATLAB, ISBN 978-0-8176-4321-8 Dynamical Systems with Applications using Mathematica, ISBN 978-0-8176-4482-6