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Spectral Analysis of Nonlinear Operators

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Spectral Analysis Of Nonlinear Operators

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Spectral Analysis of Nonlinear Operators S. Fucik, J. Necas, J. Soucek, 2014-01-15 **Spectral Analysis of Nonlinear Operators** Svatopluk Fucik, 1973 *Spectral Analysis of Nonlinear Operators* Svatopluk Fucik, 1973 *Spectral Analysis of Nonlinear Operators* S. Fucik, J. Necas, J. Soucek, V. Soucek, 2006-11-15 *Spectral analysis of nonlinear operators* Svatopluk Fucik, 1973 Nonlinear Spectral Theory Jürgen Appell, Espedito De Pascale, Alfonso Vignoli, 2008-08-22 In view of the eminent importance of spectral theory of linear operators in many fields of mathematics and physics it is not surprising that various attempts have been made to define and study spectra also for nonlinear operators This book provides a comprehensive and self contained treatment of the theory methods and applications of nonlinear spectral theory The first chapter briefly recalls the definition and properties of the spectrum and several subspectra for bounded linear operators Then some numerical characteristics for nonlinear operators are introduced which are useful for describing those classes of operators for which there exists a spectral theory Since spectral values are closely related to solvability results for operator equations various conditions for the local or global invertibility of a nonlinear operator are collected in the third chapter The following two chapters are concerned with spectra for certain classes of continuous Lipschitz continuous or differentiable operators These spectra however simply adapt the corresponding definitions from the linear theory which somehow restricts their applicability Other spectra which are defined in a completely different way but seem to have useful applications are defined and studied in the following four chapters The remaining three chapters are more application oriented and deal with nonlinear eigenvalue problems numerical ranges and selected applications to nonlinear problems The only prerequisite for understanding this book is a modest background in functional analysis and operator theory It is addressed to non specialists who want to get an idea of the development of spectral theory for nonlinear operators in the last 30 years as well as a glimpse of the diversity of the directions in which current research is moving **LECTURE NOTES IN MATHEMATICS, NUMBER 346, SPECTRAL ANALYSIS OF NONLINEAR OPERATORS.** SVATOPLUK. FUCIK, 1973 Ordinary and Partial Differential Equations W. N. Everitt, 2006-11-15 **Nonlinear System Identification** Stephen A. Billings, 2013-07-29 *Nonlinear System Identification NARMAX Methods in the Time Frequency and Spatio Temporal Domains* describes a comprehensive framework for the identification and analysis of nonlinear dynamic systems in the time frequency and spatio temporal domains This book is written with an emphasis on making the algorithms accessible so that they can be applied and used in practice Includes coverage of The NARMAX nonlinear autoregressive moving average with exogenous inputs model The orthogonal least squares algorithm that allows models to be built term by term where the error reduction ratio reveals the percentage contribution of each model term Statistical and qualitative model validation methods that can be applied to any model class Generalised frequency response functions which provide significant insight into nonlinear behaviours A completely new class of filters that can move split spread and focus energy The response spectrum map and the

study of sub harmonic and severely nonlinear systems Algorithms that can track rapid time variation in both linear and nonlinear systems The important class of spatio temporal systems that evolve over both space and time Many case study examples from modelling space weather through identification of a model of the visual processing system of fruit flies to tracking causality in EEG data are all included to demonstrate how easily the methods can be applied in practice and to show the insight that the algorithms reveal even for complex systems NARMAX algorithms provide a fundamentally different approach to nonlinear system identification and signal processing for nonlinear systems NARMAX methods provide models that are transparent which can easily be analysed and which can be used to solve real problems This book is intended for graduates postgraduates and researchers in the sciences and engineering and also for users from other fields who have collected data and who wish to identify models to help to understand the dynamics of their systems

Topological Degree Theory and Applications Yeol Je Cho, Yu-Qing Chen, 2006-03-27 Since the 1960s many researchers have extended topological degree theory to various non compact type nonlinear mappings and it has become a valuable tool in nonlinear analysis Presenting a survey of advances made in generalizations of degree theory during the past decade this book focuses on topological degree theory in normed spaces and its ap

Sustained Simulation Performance 2016 Michael M. Resch, Wolfgang Bez, Erich Focht, Nisarg Patel, Hiroaki Kobayashi, 2016-11-30 The book presents the state of the art in high performance computing and simulation on modern supercomputer architectures It explores general trends in hardware and software development and then focuses specifically on the future of high performance systems and heterogeneous architectures It also covers applications such as computational fluid dynamics material science medical applications and climate research and discusses innovative fields like coupled multi physics or multi scale simulations The papers included were selected from the presentations given at the 20th Workshop on Sustained Simulation Performance at the HLRS University of Stuttgart Germany in December 2015 and the subsequent Workshop on Sustained Simulation Performance at Tohoku University in February 2016

Panamerican Mathematical Journal, 1998 **Sustained Simulation Performance 2017** Michael M. Resch, Wolfgang Bez, Erich Focht, Michael Gienger, Hiroaki Kobayashi, 2017-10-24 This book presents the state of the art in High Performance Computing on modern supercomputer architectures It addresses trends in hardware and software development in general as well as the future of High Performance Computing systems and heterogeneous architectures The contributions cover a broad range of topics from improved system management to Computational Fluid Dynamics High Performance Data Analytics and novel mathematical approaches for large scale systems In addition they explore innovative fields like coupled multi physics and multi scale simulations All contributions are based on selected papers presented at the 24th Workshop on Sustained Simulation Performance held at the University of Stuttgart s High Performance Computing Center in Stuttgart Germany in December 2016 and the subsequent Workshop on Sustained Simulation Performance held at the Cyberscience Center Tohoku University Japan in March 2017

Introduction to the

Theory of Nonlinear Elliptic Equations Jindřich Nečas, 1983 **Spectral Theory and Nonlinear Functional Analysis** Julian Lopez-Gomez, 2001-03-28 This Research Note addresses several pivotal problems in spectral theory and nonlinear functional analysis in connection with the analysis of the structure set of zeroes of a general class of nonlinear operators. Appealing to a broad audience it contains many important contributions to linear algebra, linear functional analysis, nonlinear functional analysis, and topology. The author gives several applications of the abstract theory to reaction-diffusion equations and systems. The results presented cover a thirty-year period and cut across a variety of mathematical fields. *The American Mathematical Monthly*, 1991 Nonlinear Semigroups and Differential Equations in Banach Spaces Viorel Barbu, 1976-04-06 This book is concerned with nonlinear semigroups of contractions in Banach spaces and their application to the existence theory for differential equations associated with nonlinear dissipative operators. The study of nonlinear semigroups resulted from the examination of nonlinear parabolic equations and from various nonlinear boundary value problems. The first work done by Y. Komura stimulated much further work and interest in this subject. Thus a series of studies was begun and then continued by T. Kato, M. G. Crandall, A. Pazy, H. Brezis, and others who made important contributions to the development of the theory. The theory as developed below is a generalisation of the Hille-Yosida theory for one-parameter semigroups of linear operators and is a collection of diversified results unified more or less loosely by their methods of approach. This theory is also closely related to the theory of nonlinear monotone operators. Of course not all aspects of this theory could be covered in our exposition and many important contributions to the subject have been excluded for the sake of brevity. We have attempted to present the basic results to the reader and to orient him toward some of the applications. This book is intended to be self-contained. The reader is assumed to have only a basic knowledge of functional analysis, function theory, and partial differential equations. Some of the necessary prerequisites for the reading of this book are summarized with or without proof in Chapter I. **Mathematics of the USSR**, 1967 **Eigenvalues of Non-linear Problems** Giovanni Prodi, 1974 **MRC Technical Summary Report** Mathematics Research Center (United States Army), 1979

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