

CONTENTS

List of Contributors
Preface

xiii
xix

Invited Addresses and Research Reports

| | |
|--|----|
| On Contracting Interval Iteration for Nonlinear Problems in IR^n : I | 3 |
| <i>E. Adams and W. F. Ames*</i> | |
| A Constructive Method for Linear and Nonlinear Stochastic Partial Differential Equations | 13 |
| <i>G. Adomian</i> | |
| A Nonlinear Integral and a Bang-Bang Theorem | 25 |
| <i>Richard A. Alò,* T. Alvager, and André de Korvin</i> | |
| Optimal Control of Diffusion–Reaction Systems | 47 |
| <i>H. T. Banks,* M. C. Duban, and J. P. Kernevez</i> | |
| A Nonlinear Generalization of the Heat Equation Arising in Plasma Physics | 61 |
| <i>James G. Berryman and Charles J. Holland*</i> | |
| Periodic Solutions of Delay Differential Equations Arising in Some Models of Epidemics | 67 |
| <i>Stavros N. Busenberg* and Kenneth L. Cooke</i> | |

**Indicates the author who presented the paper at the conference.*

| | |
|---|-----|
| Comparison Theorems for Systems of Reaction–Diffusion Equations | 79 |
| <i>Jagdish Chandra and Paul Wm. Davis*</i> | |
| Sequential Conjugate Gradient–Restoration Algorithm for Optimal Control Problems with Nondifferential Constraints | 89 |
| <i>J. R. Cloutier and A. Miele*</i> | |
| Rotating Spiral Waves and Oscillations in Reaction–Diffusion Equations | 95 |
| <i>Donald S. Cohen</i> | |
| Some Applications of Rothe’s Method to Parabolic and Related Equations | 111 |
| <i>C. Corduneanu</i> | |
| A Coarse-Resolution Road Map to Methods for Approximating Solutions of Two-Point Boundary-Value Problems | 123 |
| <i>James W. Daniel</i> | |
| Cone-Valued Periodic Solutions of Ordinary Differential Equations | 127 |
| <i>Klaus Deimling</i> | |
| The Bistable Nonlinear Diffusion Equation: Basic Theory and Some Applications | 143 |
| <i>Paul C. Fife</i> | |
| Product Integral Representation of Solutions to Semilinear Volterra Equations with Delay | 161 |
| <i>W. E. Fitzgibbon</i> | |
| Angle-Bounded Operators and Uniqueness of Periodic Solutions of Certain Ordinary Differential Equations | 175 |
| <i>Chaitan P. Gupta</i> | |
| Compartmental Models of Biological Systems: Linear and Nonlinear | 185 |
| <i>John A. Jacquez</i> | |

| | |
|---|-----|
| New Optimization Problems for Dynamic Multicontroller Decision Theory | 207 |
| <i>Harriet Kagiwada</i> | |
| Stability Technique and Thought Provocative Dynamical Systems II | 215 |
| <i>G. S. Ladde</i> | |
| Reaction–Diffusion Equations in Abstract Cones | 219 |
| <i>V. Lakshmikantham,* S. Leela, and A. S. Vatsala</i> | |
| Numerical Solution of Neuromuscular Systems | 245 |
| <i>K. V. Leung, M. N. Oğuztöreli,* and R. B. Stein</i> | |
| Separatrices for Dynamical Systems | 267 |
| <i>Roger C. McCann</i> | |
| Stability Problems for Hopf Bifurcation | 273 |
| <i>P. Negrini and L. Salvadori*</i> | |
| An Iterative Method for Approximating Solutions to Nonlinear Partial Differential Equations | 287 |
| <i>J. W. Neuberger</i> | |
| On the Existence of Invariant Measures | 299 |
| <i>Giulio Pianigiani</i> | |
| The Role of Direct Feedback in the Cardiac Pacemaker | 309 |
| <i>Richard E. Plant</i> | |
| The Current State of the N -Body Problem | 323 |
| <i>Harry Pollard</i> | |
| Stability of McShane Systems | 325 |
| <i>A. N. V. Rao and C. P. Tsokos*</i> | |
| Constructive Techniques for Accretive and Monotone Operators | 335 |
| <i>Simeon Reich</i> | |

| | |
|--|-----|
| <i>SUPOR Q: A Boundary Problem Solver for ODEs</i> | 347 |
| <i>M. R. Scott* and H. A. Watts</i> | |
| Some Recent Developments in Stability of General Systems | 351 |
| <i>Peter Seibert</i> | |
| On Certain Solutions of an Integrodifferential Equation | 373 |
| <i>George Seifert</i> | |
| A Green's Formula for Weak Solutions of Variational Problems | 381 |
| <i>R. E. Showalter</i> | |
| Application of Fixed Point Theorems in Approximation Theory | 389 |
| <i>S. P. Singh</i> | |
| Equivalence of Conjugate Gradient Methods and Quasi-Newton Methods | 395 |
| <i>R. A. Tapia</i> | |
| Approximate Solution of Elliptic Boundary-Value Problems by Systems of Ordinary Differential Equations | 397 |
| <i>Russell C. Thompson</i> | |
| Asymptotic Behavior of a Class of Discrete-Time Models in Population Genetics | 407 |
| <i>H. F. Weinberger</i> | |

CONTRIBUTED PAPERS

| | |
|---|-----|
| The Volume of Distribution in Single-Exit Compartmental Systems | 425 |
| <i>David H. Anderson</i> | |
| On Identification of Compartmental Systems | 439 |
| <i>D. H. Anderson, J. Eisenfeld, and S. Sandberg*</i> | |

| | |
|--|-----|
| Preconditioning for Constrained Optimization Problems with Applications on Boundary-Value Problems | 449 |
| <i>Owe Axelsson</i> | |
| Evaluation of Quasilinear Techniques for Nonlinear Processes with Random Inputs | 451 |
| <i>M. Balakrishna and David A. Hullender</i> | |
| Two Problems in Nonlinear Finite Element Analysis | 467 |
| <i>G. F. Carey,* T. T. Pan, and R. Renka</i> | |
| Fixed Point Theory and Inwardness Conditions | 479 |
| <i>James Caristi</i> | |
| A Direct Computational Method for Estimating the Parameters of a Nonlinear Model | 485 |
| <i>Stephen W. Cheng* and Jerome Eisenfeld</i> | |
| A Note on the Asymptotic Behavior of Nonlinear Systems | 499 |
| <i>Kuo-Liang Chiou</i> | |
| A Second-Stage Eddy–Viscosity Calculation for the Flat-Plate Turbulent Boundary Layer | 507 |
| <i>Sue-Li Chuang* and Fred R. Payne</i> | |
| Nonlinear Optimization and Equilibria in Policy Formation Games with Random Voting | 519 |
| <i>Peter Coughlin</i> | |
| On the Bounded Solutions of a Nonlinear Convolution Equation | 529 |
| <i>Odo Diekmann and Hans G. Kaper*</i> | |
| Some Unresolved Questions Pertaining to the Mathematical Analysis of Fluorescence Decay Data | 531 |
| <i>Jerome Eisenfeld and Corey C. Ford*</i> | |
| Separation and Monotonicity Results for the Roots of the Moment Problem | 543 |
| <i>Jerome Eisenfeld and James Hallmark*</i> | |

| | |
|---|-----|
| System Identification of Models Exhibiting Exponential, Harmonic, and Resonant Modes | 555 |
| <i>J. Eisenfeld and B. Soni*</i> | |
| Differential Equation Algorithms for Minimizing a Function Subject to Nonnegative Constraints | 569 |
| <i>B. S. Goh</i> | |
| Stability of a Nonlinear Delay Difference Equation in Population Dynamics | 577 |
| <i>B. S. Goh</i> | |
| Bilinear Approximation and Harmonic Analysis of Analytic Control/Analytic State Systems | 587 |
| <i>R. D. S. Grisell</i> | |
| Persistent Sets via Lyapunov Functions | 605 |
| <i>G. W. Harrison</i> | |
| Spatial Heterogeneity and the Stability of Predator–Prey Systems: Population Cycles | 607 |
| <i>Alan Hastings</i> | |
| Cauchy System for the Nonlinear Boundary-Value Problem of a Shallow Arch | 619 |
| <i>R. E. Kalaba and E. A. Zagustin*</i> | |
| A Summary of Recent Experiments to Compute the Topological Degree | 627 |
| <i>Baker Kearfott</i> | |
| Computation of Eigenvalues/Eigenfunctions for Two-Point Boundary-Value Problems | 635 |
| <i>M. E. Lord,* M. R. Scott, and H. A. Watts</i> | |
| A Continuum Model Appropriate for Nonlinear Analysis of the Solidification of a Pure Metal | 657 |
| <i>Robert N. Maurer, Ronald D. Notestine, and David J. Wollkind*</i> | |

| | |
|---|-----|
| Qualitative Dynamics from Asymptotic Expansions | 669 |
| <i>J. A. Murdock</i> | |
| A Second-Stage Eddy–Viscosity Model for Turbulent Fluid Flows: Or a Universal Statistical Tool? | 675 |
| <i>Fred R. Payne</i> | |
| Fixed Point Iterations Using Infinite Matrices | 689 |
| <i>K. L. Singh</i> | |
| A Numerical Method for Solving the Hamilton–Jacobi Initial Value Problem | 705 |
| <i>Michael Tamburro</i> | |
| Differential Geometric Methods in Nonlinear Programming | 707 |
| <i>Kunio Tanabe</i> | |
| Limiting Equations and Total Stability | 721 |
| <i>F. Visentin</i> | |