

# Contents

<b>Part I: General Analytical Methods</b>	1
Reversibility, Homoclinic Points, and the Hénon Map <i>Robert L. Devaney</i>	3
The Applicability of Mel'nikov's Method to (Highly) Dissipative Systems <i>Fathi M. A. Salam</i>	15
Transversal Heteroclinic Intersections in Slowly Varying Systems <i>Henry L. Kurland and Mark Levi</i>	29
Stochastically Perturbed Hopf Bifurcation <i>S. T. Ariaratnam and N. Sri Namachchivaya</i>	39
The LaSalle Invariance Principle in Infinite Dimensional Hilbert Space <i>M. Slemrod</i>	53
Damping in Nonlinear Solid Mechanics <i>Stuart S. Antman</i>	60
<b>Part II: General Simulation Methods</b>	73
Three-Dimensional Rotation Instrument for Displaying Strange Attractors <i>L. O. Chua and T. Sugawara</i>	75
A Double Strange Attractor <i>Tyre A. Newton, Daniel Martin and Roy B. Leipnik</i>	117
Forced Two-Well Potential Duffing's Oscillator <i>Yoshisuke Ueda, Hiroyuki Nakajima, Takashi Hikiyara and H. Bruce Stewart</i>	128
A Chaotic Saddle Catastrophe in Forced Oscillators <i>H. Bruce Stewart</i>	138
On the Simulation of a Paradigm of Nonlinear Dynamics <i>Y. A. Saet and G. L. Viviani</i>	150

<b>Part III: <i>Electrical Engineering I: Nonlinear Circuits and Systems</i></b>	157
An Experimental Investigation of Chaos in an RF Driven Josephson Junction <i>A. Davidson</i>	159
Soliton Experiments in Annular Josephson Junctions <i>N. F. Pedersen and A. Davidson</i>	166
Some Qualitative Aspects of Power System Dynamics <i>Harry G. Kwatny and Leon Y. Bahar</i>	175
<b>Part IV: <i>Electrical Engineering II: Control Systems</i></b>	197
Smoothing and Linearization of Discontinuous Control Systems <i>R. W. Brockett and W. A. Cebuhar</i>	199
Applications of Nonlinear Systems Theory to Control Design <i>L. R. Hunt and Ramiro Villarreal</i>	209
Local Bifurcation Control <i>Eyad H. Abed</i>	224
Stabilization of Nonlinear Systems with Uncontrollable Linearization <i>S. Behrta and S. Sastry</i>	242
Stability Analysis of Hybrid Composite Dynamical Systems <i>M. S. Mousa, R. K. Miller and A. N. Michel</i>	256
<b>Part V: <i>Mechanical Engineering I: Solids and Vibrations</i></b>	279
Chaotic Dynamics in Solid Mechanics <i>Francis C. Moon</i>	281
Rolling of Ships in Large-Amplitude Waves <i>Ali H. Nayfeh and Ahmed A. Khdeir</i>	290
Chaotic Motions in Parametrically Excited Systems with Quadratic Nonlinearities <i>P. R. Sethna and Z. Feng</i>	304
On the Effects of Asymmetries on a System Near a Codimension Two Point <i>Steven W. Shaw and P. R. Sethna</i>	317
Bifurcations in Flow-Induced Oscillations in Tubes Carrying a Fluid <i>A. K. Bajaj</i>	333
Periodic and Chaotic Motions of a Buckled Beam Experiencing Parametric and External Excitation <i>C. M. Krousgrill and R. I. Zadoks</i>	352
<b>Part VI: <i>Mechanical Engineering II: Mechanical Systems</i></b>	371
The Dynamics of Two Coupled Rigid Bodies <i>R. Grossman, P. S. Krishnaprasad and Jerrold E. Marsden</i>	373
The Equilibrium Dynamics of Rotating Systems <i>John Baillieul</i>	379
Control of Constrained Hamiltonian Systems and Applications to Control of Constrained Robots <i>N. Harris McClamroch and Anthony M. Bloch</i>	394
Robust Nonlinear Computed Torque Control for Robot Manipulators <i>Rama K. Yedavalli</i>	404