Book Announcements

BERTIN, J. J. and **SMITH, M. L.**, *Aerodynamics for Engineers,* 2nd ed., Prentice-Hall, Englewood Cliffs, NJ, 1989, 624 pages.

Purpose: This book presents an introductory level treatment of basic fluid mechanics, airfoil and wing aerodynamics, computational fluid mechanics, and hypersonic flows. New chapters in the edition on computational fluid dynamics and hypersonic flight are also included.

Contents: Fluid properties; fundamentals of fluid mechanics; dynamics of incompressible, inviscid flow field; incompressible flows; characteristic parameters for airfoil and wing aerodynamics; two-dimensional incompressible flows around thin airfoils; incompressible flow about wings of finite span; dynamics of a compressible inviscid flow field; compressible subsonic and transonic flows; two-dimensional supersonic flows around thin airfoils; supersonic flows over wings and airplane configuration; computational fluid dynamics; hypersonic flows; aerodynamic design considerations; appendices.

BLINN, K. W., *Legal and Ethical Concepts in Engineering,* Prentice-Hall, Englewod Cliffs, NJ, 1989, 352 pages.

Purpose: This book provides a conceptual overview of those areas of law in which engineers should have some knowledge to understand the environment in which decisions are formulated affecting their professional and business activities.

Contents: Engineering practice and management: legal and ethical issues; the judicial system: overview of legal sources and concepts; definition, formality, and nature of contract; contract interpretation, statute of frauds and assignment; breach of contract: excuse and remedies; criminal law and international torts; torts: negligence; product liability; agency and business enterprises; construction and engineering contracts; real and personal property; intellectual property; labor; administrative process; fact finding: use of expert evidence.

ZWART, H. J., *Geometric Theory for Infinite Dimensional Systems,* Lecture Notes in Control and Information Sciences, Vol. 115, Springer-Verlag, New York, 1989, 156 pages.

Purpose: This monograph is addressed to researchers in the field of geometric theory of infinite dimensional systems.

Contents: Invariance concepts; system invariance concepts; disturbance decoupling problem; controlled invariance for discrete spectral systems; disturbance decoupling problem with measurement feedback; disturbance decoupling problem with measurement feedback and stability.

LEVINE, R. I. and **DRANG, D.**, *Neural Networks: The 2nd AI Generation,* McGraw-Hill, Hightstown, NJ, 1988, 256 pages.

Purpose: This book introduces and explains the concepts of advanced artificial intelligence. Applications include examples from finance, insurance, the sciences, and engineering.

Contents: Artificial neural networks; conceptual overview and modeling; the threshold logic unit: hardware and software; software design; system design; Hebbian implementation; Hopfield implementation; normal convergence; analysis and sample run of a program, its weaknesses and strengths; research directions; multiple-paradigm systems; object oriented multiple-paradigm expert systems; blackboard integration; rule/probability/minimax/neural multiple-paradigm systems.

SPALL, J. C., *Bayesian Analysis of Time Series and Dynamic Models,* Marcel Dekker, New York, 1988, 576 pages.

Purpose: This book presents a collection of chapters on two types of time series models for dynamic systems: Autoregressive moving average (ARMA), and linear and nonlinear state-space models.

Contents: Non-Gaussian and nonlinear models; effect of abrupt changes in the system; frequency domain characteristics of autoregressive models with limited data; Kalman filter implementations such as image processing based on satellite radiometer measurements; parameter estimation and order determination; equivalence and contrasts between Bayesian and non-Bayesian methods; stationary and nonstationary linear time series models; selection of Bayesian prior distributions based on Shannon information theory.

DANBY, J. M. A., *Fundamentals of Celestial Mechanics,* 2nd ed., Willmann-Bell, Inc., Richmond, VA, 1988. 466 pages.

Purpose: This is a text for undergraduates as well as graduates. This edition also contains computer programs for personal computers in BASIC language.

Contents: The astronomical background; introduction to vectors; introduction to vectorial mechanics; central orbits; properties of solid bodies; two-body problem; determination of orbits; three-body problem; n-body problem; numerical procedures; perturbations; motion of the moon; Earth and its rotation; moon and its rotation; appendices.

SZEBEHELY, V. G., *Adventures in Celestial Mechanics—A First Course in the Theory of Orbits,* Univ. of Texas Press, Austin, TX, 1989, 175 pages.

Purpose: The purpose of this book is to demonstrate the beauty of orbit and celestial mechanics. The treatment is quite simple and plenty of historical references are included.

Contents: Circular orbits of Earth satellites; historical review; problem of two-bodies; elliptical orbits; Kepler's laws and equation, regularization; orbit maneuvers; hyperbolic and parabolic orbits; Lambert's theorem; orbital elements; perturbation methods; orbits of artificial satellites; problem of three bodies; appendices.

ATLURI, S. N. and **AMOS, A. K.**, (eds.), *Large Space Structures—Dynamics and Control,* Springer-Verlag, New York, 1988, 363 pages.

Purpose: This monograph is a collection of chapters on recent developments in structural dynamics and control.

Contents: Reduced order modelling; analysis of nonlinear dynamic response; active/passive control methods; control/structure interaction; optimization techniques.

PARKER, T. and **CHUA, L. O.**, *Practical Numerical Algorithms for Chaotic Systems,* Springer-Verlag, New York, 1989, 344 pages.

Purpose: This book explains the significant features of chaotic systems in an intuitive manner without depending too much on mathematics.

Contents: Integration routines; variational equation; periodic solution; phase portraits; Poincare map, bifurcation diagrams; Lyapunov exponents; reconstruction of attractors; simulation without programming.