presented. Again, the end of the chapter includes sections on nomenclature, practice problems, and references for further reading.

Chapter 5, 'Process forecasting, modeling, and control of time-dependent systems' is another example of the excellent mix of theory and practice presented throughout the text. The authors include a variety of case problems that demonstrate the use of neural computing for predictive modeling of a batch fermentation process, a planted reactor control problem, and process control for an arc furnace. Each case is well explained and the research is current.

The last chapter, 'Development of expert networks: a hybrid system of expert systems and neural networks', presents the methodology for integrating expert systems and neural networks. The methodology is also illustrated with an extensive case study addressing the bioseparation of proteins in aqueous two-phase systems. As with each chapter, there are practice problems and references for further reading.

An appendix is included at the end of Chapter 6 that examines the connections between neural network and multivariate statistical data analysis. Some of my research focuses on this area, and I found the topical discussion to be very informative and practical. A glossary of terms is present at the end of the book for ease of reader convenience.

In summary, this is an excellent introductory text on neural networks for use in bioprocessing and chemical engineering applications. The book could be used in either a senior undergraduate or graduate engineering course. The authors have blended theory and practice to create a very useful text that offers ideas for future research, yet also can be used in a pragmatic way to design neural networks. The software disk includes some sample files to run and to give practice in building neural networks. Although the title suggests a narrow field of specialty, I found the discussion to be quite general and the case studies to be very useful in illustrating the functions of neural computing. This is one of the best books that I have read on the topic of neural computing in engineering.

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Current Advances in Mechanical Design and Production

M.E. Elarabi and A.S. Wifi (eds)

This book is a set of reviewed papers that had been presented in a well-respected international conference on Mechanical Design and Production. The book includes 46 papers authored by scholars from over 20 countries. The book is subdivided into eight sections related to the field of mechanical design and production in addition to a keynote lecture presented by Professor W. Johnson, University of Cambridge, UK

The keynote lecture presents historical topics relevant to general issues of technological advances and innovation in the design and manufacturing field. The author included innovations in the field during the pre-christian technology in Alexandria and the recent history. The recent history was presented by the work of H.W. Swift (1894–1955) and the contributions of the author in the manufacturing engineering field. H.W. Swift was appointed as Professor of Engineering at University of Sheffield, U.K., in 1936 and retired in 1955. Professor Swift worked in power transmission using belts, journal bearings lubrication and plasticity investigations into metal-forming processes such as deep drawings, whereas the work of Professor Johnson was in the design and production fields. He presented very fascinating personal successes and failures represented by five examples that describe work in the metal forming field.

The book is subdivided into eight sections containing high-quality research and review papers in the following fields: (1) materials processes and characterization; (2) constitutive modeling; (3) simulation and analysis of manufacturing processes; (4) numerical analysis of structures; (5) fracture analysis; (6) design and tribology; (7) dynamics, control and robotics; and (8) new trends in industrial and manufacturing engineering.

The materials processes and characteristics section includes eight papers constituting advanced research in metal spray, continuous casting of steel, production of composites, weldability of titanium-based alloys, electrodischarge machining and characterization of the mechanical stresses in engineering materials by using acousto-ultrasonic techniques. The section on constitutive modeling contains four papers presenting recent advances in numerical modeling approaches applied to metal-forming processes, porous solids, and torsional creep. These models are basically finite element models. The third, fourth and fifth sections are natural extensions of the second section where finite element models have been used for simulation of manufacturing processes, analysis of structures, and fracture analysis. Finite element modeling has been applied very carefully to difficult problems such as high-speed precise blanking, rolling,

high-speed machining, structural analysis of aluminium reduction cell cathode casings, buckling of long beams, and cyclic deformation at front of cracks.

Section six on design and tribology presents innovative work in feature-based design of mechanical products, design of filament-wound composites pressure vessels, virtual reality potential for engineering, and application of expert systems for design of plastics. Two papers in the tribology area include investigations in the micro area of contact zones between rubbers, mineral oil, and steel, and visco-elastohydrodynamic lubrication of line contacts.

A nice blend of eight papers in the area of dynamic, control and robotics constitutes section seven of the book. Papers in dynamics have tackled vibration isolation and car dynamics, and the papers in control area included a review paper on recent applications and design of fluid power in Japan, and other papers on the application of control systems to robotics.

The last section contains five papers that deal with new trends in industrial engineering and manufacturing. The first paper presents an innovative approach for the future of industrial engineering as an interdisciplinary educational system that meets the demand of the society. There are also two papers that explain novel methods on rapid product design and manufacturing, and rapid prototyping. The book ends with a paper on a new technique for nesting irregular shapes based on rectangular modules, which is an important issue in stamping processes.

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