system. Optional "noise" on the measured output may also be added to improve realism. The addition of an optional feedforward controller for the disturbance is also being considered.

Copies of the program (on 5 1/4 inch MS-DOS formatted diskette) and user documentation are available for $15 to cover duplication and postage. The program is supplied as executable files (compiled using the IBM BASCOM compiler), but BASIC source files are included as well.

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ChE book reviews

NUMERICAL HEAT TRANSFER

by Tien-Mo Shih
Hemisphere Publishing, NY; 563 pages (1984)

Reviewed by
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This is a lengthly book consisting of fifteen chapters in four parts. Part I is entitled "Preliminaries" and consists of the four chapters: 1. "Numerical Methods Used in Heat Transfer (I)," where finite difference and the finite element are introduced, 2. "Numerical Methods Used in Heat Transfer (II)," where a more extensive discussion of the Galerkin and Collocation methods appears, 3. "Numerical Methods Used in Heat Transfer (III)," that discusses higher-order finite elements, integral method and perturbation solutions, and 4. "Numerical Properties of Various Discretization Schemes."

Part 2 describes "Fundamental Heat Transfer Modes" in the chapters: 5. "Heat Conduction," 6. "Laminar Forced Convection: Hydrodynamic Boundary Layer (I)," 7. "Laminar Forced Convection: Hydrodynamic Boundary Layer (II)," 8. "Streamwise Diffusive Flows," 9. "Transport of Energy and Species," and 10. "Radiation."

Part 3 consists of three chapters on "Important Heat Transfer Phenomena": 11. "Laminar Free Convection and Mixed Convection," 12. "Introduction to Turbulent Flows," and 13. "Introduction to Combustion Phenomena."

"Numerical Analyses" is the fourth and final part made up of two chapters: 14. "Spaces and Error Bounds," and 15. "Comparison of Finite-Difference Method and Finite-Element Method."

There are also three appendices.

This book is detailed in its coverage of numerical method and examples; the literature references are concentrated largely in the 1970's and early 1980's. In some areas, such as the coverage of stiff, coupled, convective-diffusion models in Chapter 8, the material provides a welcome addition and summary of techniques such as upwinding in the Galerkin finite element method. However, there is a less than adequate treatment of transient problems using modern integration packages such as Gear's method to solve the evolution problem, although there is a discussion of the well-understood numerical instabilities and/or inconsistencies introducted by traditional explicit or explicit-implicit schemes for the initial-boundary value problem in Chapter 4.

This book could be used as a source of examples in a course in heat transfer or numerical methods. It would seem unsuitable as a textbook for either however, because of its restricted treatment of numerical methods on the one hand and because of its lack of the necessary perspective on the role of analytical methods and physical property measurements in heat transfer on the other.

The individual sections of the book are clearly written, but are heavy in detail at the expense of perspective. The printing is carefully done and the book seems to be relatively free of typographical errors. □