Suggested reading

Listed are synopses of recent books that should be of interest to the readers of the *IBM Systems Journal*. Inquiries should be directed to the publishers cited.

Advances in computer architecture, Second edition, Glenford J. Myers, Wiley-Interscience, New York, 1982. 545 pp. (ISBN 0–471–07878–6). This book is a substantial update of the first edition published in 1978. It provides extensive information on computer architectures that might be successors to the von Neumann architecture currently used in most computers. Such state-of-the-art developments as very-large-scale integration of circuits, high-level language improvements, data base machines, and work in the area of data flow are discussed as offering answers to the serious problems that have arisen in current computer architectures. Reasons for implementing new architectures to replace the von Neumann computer architecture are thoroughly explored.

Applications development without programmers, James Martin, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1982. 350 pp. (ISBN 0–13–038943–9). With the development of comprehensive nonprocedural languages, many organizations have found significant benefit in providing users with the tools to meet their own information processing requirements. The author reviews the capability of such offerings including query facilities, report generators, graphics languages, applications generators, very-high-level programming languages, and parameter-driven applications packages. Each development methodology is illustrated with scenarios from applications created using commercially available software. The implementation of these capabilities has significant implications for the entire data processing organization. Also discussed are management considerations for the implementation, control, and operation of an Information Center.

Architecture and implementation of large scale IBM computer systems, N. S. Prasad, Q. E. D. Information Sciences, Inc., Wellesley, MA, 1981. 332 pp. (ISBN 0–89435–051–X). The author presents the System/370 Architecture through detailed chapters discussing the CPU, storage, interrupt structure, channel, and multiprocessing implementations. The architectural concepts of the IBM 3033 and 3081 processors are treated as an extension of the 370 design. In addition, the book includes an informative discussion of input/output control unit and device implementations. An appendix is included which provides an introduction to operating system concepts, specifically the MVS operating system.

Computer-aided modelling and simulation, Jan A. Spriet and Ghislain C. Vansteenkiste, Academic Press, Inc., London, 1982. 490 pp. (ISBN 0–12–659050–8). This book is one of the volumes in the International Lecture Series in Computer Science. Material for the book was developed from the contributions of five experts in the areas of modeling and simulation, along with comments from others. Topics on modeling are presented in Chapters 2 through 5, and simulation is discussed in Chapters 6 through 8. The authors have attempted to provide a synthesis of currently known work in the field. Specific aspects included are mathematical models and related methodology, model-building methodology for difference and differential equations, methodology for model information storage and integration, continuous event and discrete event modeling approaches for model simulation, and simulation systems and architectures.

Functional programming and its applications, Editors: J. Darlington, P. Henderson, and D. A. Turner, Cambridge University Press, New York, 1982. 306 pp. (ISBN 0–521–24503–6). This book presents a group of papers that stem from an advanced course on functional programming held in July 1981. Functional programming is seen as an aid to producing and maintaining software reliably and cheaply and to exploiting the improvements in hardware wrought by very-large-scale integration. Functional languages are seen as a potential alternative to conventional programming languages.

Among the topics included are recursion equations, the LISP language, the FP style of functional programming, mathematical aspects, interpreters, and program transformation.

Human factors in office automation, Wilbert O. Galitz (CNA Insurance), Life Office Management Association, Atlanta, GA, 1980. 237 pp. It is generally accepted that the human factors of an automated system have considerable impact upon its acceptance by its users and the benefits to be derived through its implementation. The author provides a description of those human functions and faculties that should be considered in the systems design. From this functional description he makes specific design recommendations for both the data processing system and the physical environment in which the tasks are to be performed.

Introduction to real-time software design, S. T. Allworth, Springer-Verlag New York, Inc., New York, 1981. 140 pp. (ISBN 0-387-91175-8). This introductory text presents the general principles and techniques used in the design and development of real-time software. The author describes the hardware and software environment with specific emphasis on scheduling considerations, recovery, reliability, software design, and performance measurement.

Man-computer interaction: Human factors aspects of computers & people, Editor: B. Shackel, Sijthoff & Noordhoff International Publishers, B.V., Alphen aan den Rijn, The Netherlands, 1981. 560 pp. (ISBN 90-286-0910-5). There is currently a great deal of interest in how the "end user" interacts with computer equipment and in the extent to which systems are "user-friendly." This book was developed from selected papers dealing with man-computer interaction that were presented at an Advanced Study Institute held in September 1976. After an introductory discussion of the man-computer interaction, subjects range over a broad representation of research and applications related to this interaction. Some areas that are included are the hardware and software interfaces, modeling, conversation and communication, and effects on organizations.

Mathematics for the analysis of algorithms, Daniel H. Greene and Donald E. Knuth, Birkhäuser, Boston, 1981. 107 pp. (ISBN 3-7643-3046-5). This book is Volume 1 in a series called Progress in Computer Science, edited by E. Coffman, R. Graham, and D. Kuck. The book was developed from handouts used in a computer science course on the analysis of algorithms. It is basically a mathematics text. Readers are expected to know the fundamentals of complex variable theory and combinatorial analysis. The topics that are discussed are binomial identities, recurrence relations, operator methods, and asymptotic analysis.

Strategic planning for information systems, R. V. Head, Q. E. D. Information Sciences, Inc., Wellesley, MA, 1982. 178 pp. (ISBN 0-89435-054-4). In order to keep pace with technology, and with changing user and organizational requirements, it is imperative that information systems executives develop strategic plans. The author presents strategic planning as applied to the information systems organization in this second edition. Included are chapters presenting the basic concepts of systems planning, the effects of the organizational environment on the scope and level of planning, the systems planning methodology, and the practicalities of planning approaches. An appendix addresses the assessment of systems planning effectiveness.

The correctness problem in computer science, Editors: Robert S. Boyer and J. Strother Moore, Academic Press, Inc., London, 1981. 279 pp. (ISBN 0-12-122920-3). One view of programming is that it is a mathematical activity. In this book, one of the volumes in the International Lecture Series in Computer Science, the contributors support this view in discussing ways to improve the correctness of programs. One approach is to develop a program and its correctness proof together. Further discussion focuses on use of recursive functions and mechanical theorem-proving for program verification, use of a specification language, and the use of modal logic.

The economics of information processing, Volume I: Management perspectives, Volume II: Operations, programming, and software models, Editors: R. Goldberg and H. Lorin, John Wiley & Sons, Inc., New York, 1982. Vol. I, 238 pp.; Vol. II, 185 pp. (Vol. I.: ISBN 0–471–09206–1). (Vol. II: ISBN 0–471–09767–5). This two-volume work is a collection of material from the professional and academic communities that addresses the needs, current methods, and directions of economic assessment. Much of the work included was presented in the Symposium on the Economics of Information Processing held at the IBM Systems Research Institute. Volume I includes papers discussing such topics as improving the organizational information flow, assessing system benefits, the computer's role in the organization, and controlling system growth and performance. Volume II addresses management techniques for improving programmer productivity, the quantification and determination of computer costs, and installation management.

The software development project—planning and management, P. Bruce and S. M. Pederson, John Wiley & Sons, Inc., New York, 1982. 210 pp. (ISBN 0–471–06269). The authors describe a structured approach to the planning, costing, scheduling, and control of a software project from the definition of requirements through systems implementation. Topics presented include: an overview of the software development process, the project planning methodology, pricing information, management checklists, documentation guidelines, organizational options, and review and audit guidelines.