interesting exercises, so the reader struggling with a proof or wanting to know more will need to look elsewhere.

A full rounding error analysis is given for the FFT (Proposition 4.1 of Chapter 3) and claimed to be new, but several similar results have been published in the last 30 years and are referenced in [4, §1.4].

The presentation is good, the book having been prepared with TeX, but it could be improved. The numbering of equations, theorems and so on does not reflect the chapter number, which makes cross-referencing difficult. Some grammatical errors are present, and "Cholesky" is misspelled "Choleski" on page 100. Citations are given using an ugly alphanumeric scheme, under which the book under review would be cited as [BP94]; this makes finding a reference in the extensive bibliography more difficult than if numbers were used.

Volume 2 is referred to on page 94 in a reference to "Chapter 5", but the contents and publication date of the second volume are not mentioned. It appears that Volume 2 will include a treatment of fast matrix multiplication, which is only briefly considered in Volume 1.

Bini and Pan's book fills a gap in the literature and can be recommended as an accessible presentation of much recent research in computations with matrices and polynomials.

References

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23[65-02, 65D17]—*Mathematical aspects of geometrical modeling*, by Charles A. Micchelli, CBMS-NSF Regional Conference Series in Applied Mathematics, Vol. 65, SIAM, Philadelphia, PA, 1995, x+256 pp., 25 cm, softcover, $37.50

This monograph grew out of the author's 1990 lectures at a Regional Conference sponsored by the Conference Board of the Mathematical Sciences. This was held at Kent State University, and had as its theme, "Curves and Surfaces: An Algorithmic Approach". The book, however, concentrates on the content of only a portion of the lectures, and enters into considerable detail on the chosen topics. These topics are quickly enumerated by giving the chapter headings: 1. Matrix Subdivision, 2. Stationary Subdivision, 3. Piecewise Polynomial Curves, 4. Geometric Methods for Piecewise Polynomial Surfaces, and 5. Recursive Algorithms for Polynomial Evaluation. Chapter 1 begins with the Casteljau subdivision algorithm for the Bernstein-Bézier representation of a polynomial curve in a Euclidean space of arbitrary dimension. This leads naturally into the subject of general matrix subdivision schemes. Chapter 2 discusses the de Rham-Chaikin algorithm and the Lane-Reisenfeld algorithm. Here we encounter the *refinement* equation that plays an important role in wavelets, and one section is devoted to applications in that subject. Chapter 3 concerns representation of curves parametrically by spline functions. Many subtopics are dealt with, such as knot insertion, variation-diminishing properties of the B-spline basis, and connection matrices (which relate adjacent parts of the piecewise polynomial). In Chapter 4 the emphasis is on multivariate splines and their use in surface representation. The geometric interpretation of higher-dimensional spline functions as volumes of slices of polyhedra is central. This chapter closes with a historical vignette in the form of letters by I. J. Schoenberg and H. B. Curry. Chapter 5 discusses, among other topics, blossoming, pyramid schemes, and subdivision for multivariate polynomials. This book of 256 pages offers a concentrated mathematical development of the representation of curves and surfaces by one of the most authoritative experts in the field. It certainly establishes the current status of this rapidly unfolding area.

E. W. C.

24[41-06, 41A30, 41A99, 65-06]—*Wavelets: theory, algorithms, and applications*, Charles K. Chui, Laura Montefusco, and Luigia Puccio (Editors), Wavelet Analysis and Its Applications, Vol. 5, AP Professional, San Diego, CA, 1994, xvi+627 pp., $23\frac{1}{2}$ cm, $59.95

This is a formidable book to review. It contains twenty-eight papers, broadly sorted into seven categories. It records the transactions of a conference held in October 1993 at Taormina, Italy. Thirteen of the articles were invited specifically for the volume and fifteen were selected from a pool of contributions.

There are four papers in the first group on multiresolution analysis. Authors represented here are Cohen, Heller, Wells, Dahlke, Goodman, and Micchelli. In the second group, on wavelet transforms, there are three papers, by Terrésani, Kautsky, Turcajová, Plonka, and Tasche. The third group, on spline wavelets, contains four articles, by Steidl, Sakakibara, Lyche, Schumaker, Chui, Jetter, and Stöckler. The fourth group, on other mathematical tools for time-frequency analysis, has four papers, by Donoho, Davis, Mallat, Zhang, Suter, Oxley, Courbebaisse, Escudié, and Paul. In the fifth group there are two papers on wavelets and fractals, by Jaffard and Holschneider. The sixth group addresses numerical methods. Here there are five papers, with authors Dahmen, Prössdorf, Schneider, Bertoluzza, Naldi, Ravel, Karayannakis, Montefusco, Fischer, and Defranceschi. The seventh group is concerned with applications and contains six articles, by Wickerhauser, Farge, Goirand, Wesfreid, Cubillo, Mayer, Hudgins, Friehe, Druilhet, Attié, de Abreu Sá, Durand, Bénech, Olmo, Presti, Denjean, and Castanié.

This volume provides an excellent snapshot of the broad activity in wavelet theory. For readers of *Mathematics of Computation*, the papers in the sixth group may be of particular interest. Here one finds a detailed analysis of Galerkin schemes for pseudodifferential equations on smooth manifolds, a discussion of wavelet solutions of two-point boundary value problems on an interval, a paper on bounds for the