degree elevation as needed to satisfy certain shape-preservation and fairness criteria, holding κ and κ' to the fewest possible changes of sign. A. K. Jones proposes to fit planar data by a (parametric) polynomial spline whose curvature profile approximates, as closely as possible in a least squares sense, a user-supplied target profile and may also have to satisfy positivity and/or monotonicity and/or convexity constraints. Skillful handling leads to an optimization problem wherein both objective and constraint functions are polynomial in the unknown spline coefficients.

Rounding out the volume are various papers that speak to the issue of shape control without explicitly defining, or attempting to measure, fairness: Gallagher and Piper on convexity-preserving surface interpolation, Bloor and Wilson on interactive design using PDEs, J. Peters on surfaces of arbitrary topology using biquadratic and bicubic splines, Zhao and Rockwood on a convolution approach to N-sided patches, Beier and Chen on a simplified reflection model for interactive smoothness evaluation.

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27[12Y05, 65T10, 94B05]—*Computational number theory and digital signal processing: Fast algorithms and error control techniques*, by Hari Krishna, Bal Krishna, Kuo-Yu Lin and Jenn-Dong Sun, CRC Press, Boca Raton, FL, 1994, xviii+330 pp., 24 cm, \$59.95

Two main topics of this book are number-theoretic transforms and fast algorithms for the calculation of convolutions in digital signal processing. The relevant parts of the book are written in the same spirit as the classical monograph of McClellan and Rader [2]. The underlying algebraic structures are the residue class rings $Z(M)$ of the integers modulo M as well as polynomial rings over $Z(M)$. The third main topic of the book is error detection and correction by linear codes over $Z(M)$, with special reference to fault tolerance in modular arithmetic. It will be hard to find the material on this topic in any other book.

The authors appear to be comfortable with the algorithmic and signal processing aspects of their material, but the treatment of the algebraic background leaves a lot to be desired. The Chinese Remainder Theorem is proved several times over for various rings, when it would have been more efficient to establish once and for all the general Chinese Remainder Theorem for rings as in Lang [1, Chapter II]. Several basic definitions are wrong. For instance, on p. 32 it is said that two polynomials are relatively prime if they have no factors in common, and a similar error occurs on p. 34 in the definition of irreducible polynomials. In the definition of the order of an element on p. 46, replace "smallest non-zero value" by "smallest positive value". The book is replete with awkward formulations such as "A polynomial $A(u)$ is called *monic* if the coefficient of its highest degree is equal to 1" (Definition 3.2) and "Here the entire theorem is defined over the ring $Z(p^\alpha)$" (Theorem 4.6). On p. 80 we read that "It is necessary and sufficient that $P(u)$ be monic and of degree greater than $n-1$", but it is not said for which property this is necessary and sufficient. On p. 55 replace "Legrange" by "Lagrange". This is just a sample selection of deficiencies.

This book is useful as a reference for experts, but because of the weaknesses noted above it is not suitable as an introductory textbook.

REFERENCES

1. S. Lang, *Algebra*, Addison-Wesley, Reading, MA, 1965. MR **33**:5416
2. J. H. McClellan and C. M. Rader, *Number theory in digital signal processing*, Prentice-Hall, Englewood Cliffs, NJ, 1979.

H. N.

28[11-00, 11B83]—*The encyclopedia of integer sequences*, by N. J. A. Sloane and Simon Ploufee, Academic Press, San Diego, CA, 1995, xiv+587 pp., $23\frac{1}{2}$ cm, \$44.95

The title of this book is an accurate description, although some might argue that "A Dictionary of Integer Sequences" is a better title: it is literally a listing of some 5488 integer sequences, together with a brief description for each. The book is an updated printing, with more than twice as many entries, of an earlier book by Sloane [1].

The entries are listed in lexicographic order, except that for some reason the authors chose not to use zeros and ones in this ordering. The listing for an individual entry typically includes a sequence identification number for cross references, such as "M1234"; the leading elements of the sequence itself (typically two lines or so); a brief description, such as "orders of simple groups"; and, in many cases, an abbreviated reference, such as "MOC 21 246 67" (*Mathematics of Computation*, vol. 21, pg. 246, 1967).

For a few of the particularly interesting entries, the authors include a part- or full-page figure explaining the origin and significance of the sequence. Accompanying the entry M0692, which is a Fibonacci sequence $(1, 1, 2, 3, 5, 8, 13, 21, \dots)$, the authors define the Fibonacci and Lucas numbers with the help of tree diagrams. Accompanying entry M1141, which is the sequence of generalized Catalan numbers $(1, 1, 1, 2, 4, 8, 17, 37, \dots)$, is an inset explaining that these numbers arise in the enumeration of structures of RNA molecules. Accompanying entry M3987, the authors graphically list different ways in which an $n \times n$ chess board may be dissected into four congruent pieces. Accompanying entry M3218, the theta series of a lattice is defined and described in some detail.

In addition to the entries listed above, the book includes entries as diverse as the digits of π, the Euler numbers, the denominators of the Bernoulli numbers, successive values of the Euler totient function, the continued fraction elements of e, the elements of the recursion $a_n = a_{n-1} + a_{n-3}$, the numbers of planar maps with n edges, the numbers of irreducible positions of size n in Montreal solitaire and the Euler-Jacobi pseudoprimes.

In order to ascertain the completeness of the reference, this reviewer attempted to find a number of sequences that he has encountered in various research activities. In the majority of cases, the sequence was found. Here are some that were not: the continued fraction expansions for $\log 2$ and $\sqrt[3]{2}$, the denominators in the Taylor expansions of $\tan x$ and $e^x \cos x$, and the known Wieferich primes.

Such an exercise highlights both the value and the limitations of this type of reference. On one hand, it is very useful to be able to quickly identify an integer