analysts and approximation theorists, and of great interest to connoisseurs.

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**39[65–06, 65D17].**—HANS HAGEN (Editor), *Topics in Surface Modeling*, Geometric Design Publications, SIAM, Philadelphia, PA, 1992, x + 219 pp., $25\frac{1}{2}$ cm. Price: Softcover $45.50.

This is a collection of ten papers that evolved from a SIAM Conference on Geometric Design held at Tempe, Arizona between November 6 and 10, 1989. Some of the papers were presented there, and others were invited subsequently for this volume. The book is divided into three parts: I. Algebraic Methods, II. Variational Surface Design, and III. Special Applications.

In Part I (73 pages), all three papers concern surfaces in implicit form, $F(x, y, z) = 0$. Here we find mainly local methods that employ blending techniques to represent highly irregular surfaces. These may have holes, bumps, and other characteristics that preclude the use of anything global.

In Part II (13 pages), the first paper concerns estimating the twist vector of a surface. This estimator is then used advantageously in a patch scheme for surface representation. The second paper discusses an alternative to the Bezier patches, arrived at by direct variational methods.

In Part III (123 pages), there are five chapters. The first of these discusses at an abstract level the design problem of creating a surface that satisfies a number of nonlinear criteria (including aesthetic ones) by choosing values for a large number of parameters. The complexity of the computation and its resulting cost are troublesome aspects of this activity. The second paper addresses problems of conversion between different CAGD systems. The third again attacks the problems connected with the highly irregular surfaces that predominate in most manufacturing enterprises, such as the production of automobiles. In the latter industry, only a small proportion of parts conform to smooth free-flowing surfaces amenable to global representation. The fourth paper concerns contour representation problems that arise, for example, in medical imaging. The central question here is how to reconstruct a solid from a knowledge of some of its contours ("level sets"). Topological considerations (Morse theory) bear heavily on this topic. The final paper is devoted to problems of making $C^1$- and $C^2$-continuity connections between local surface patches.

The book should be useful to theoreticians and practitioners in Computer Aided Design.

E. W. C.

**40[65–06, 65Y25].**—HANS HAGEN (Editor), *Curve and Surface Design*, Geometric Design Publications, SIAM, Philadelphia, PA, 1992, x + 205 pp., $25\frac{1}{2}$ cm. Price: Softcover $44.50.

This is a collection of ten papers, some invited by the editor especially for this volume, and others arising from a SIAM conference on geometric design (Tempe, Arizona, November 1989). Among them are two papers on minimal-energy splines, three on weighted splines, one on geometric-continuous

B-splines, and one on the distance problem for pairs of parametric curves. These seven papers concern curves in spaces of arbitrary dimension, and constitute the first part of the book. The second part is devoted to surfaces not of tensor-product type. Here there are three papers, of which the first is a survey of scattered data fitting by triangular elements. The second concerns free-form surfaces generated as solutions of partial differential equations. The third addresses surface modeling by box splines. The book as a whole provides authoritative and timely information about the perpetual problems of constructing curves and surfaces for modeling, data-fitting, and interpolation. It should be valuable to theoreticians and to practitioners.

E. W. C.

**41[68-01, 68Q40].**—PATRICE NAUDIN & CLAUDE QUITTÉ, *Algorithmique Algébrique (avec exercices corrigés)*, Logique Mathématiques Informatique, Vol. 1, Masson, Paris, 1992, xvi + 469 pp., 24 cm. Price: Softcover F 280.

The present text is not an algebra textbook. Rather, the intended audience consists of students in mathematics or computer science that have a reasonable knowledge of linear algebra and of the theory of groups, rings, fields, etc. The authors merely discuss the computational aspects of these subjects.

The book contains five chapters. In the first chapter the computer language ADA is discussed. It is used to present explicit algorithms in the next chapters. In Chapters 2, 3, and 4, the authors deal with the arithmetic of polynomial rings, of matrices and of the ring $\mathbf{Z}/n\mathbf{Z}$, respectively. In the final chapter, the fast Fourier transform is discussed.

The book is rather "light". The authors only explain the most elementary algorithms. They do, for example, not discuss the real problems that one encounters when doing computations with matrices with integral coefficients. They do not mention any of the more recent, powerful, algorithms for primality testing or factorization of integers or polynomials. Even Berlekamp's accessible algorithm to factor polynomials over finite fields is not explained.

Given the prerequisites, it is actually quite impressive to see how little the authors succeed in doing on the 469 densely printed pages at their disposal.

R. S.

**42[11A25, 11-04].**—DAVID MOEWS & PAUL C. MOEWS, *A List of Amicable Pairs Below* $10^{11}$, University of California, Berkeley, and University of Connecticut, 53 pages deposited in the UMT file.

This table consists of a list of all 3340 amicable pairs with lower member below $10^{11}$, ordered by their lower member. The format follows [1]. For each pair, a serial number is given, as well as the type (as in [1]) of the amicable pair, the members of the pair, and their factorizations. An attempt has been made to indicate pairs that have already appeared in various previous tables of amicable pairs.

AUTHORS' SUMMARY

1. H. J. J. te Riele, *Computation of all the amicable pairs below* $10^{10}$, Math. Comp. **47** (1986), 361–368.