8[14Qxx, 65–06, 65D17, 68U05].—ROBERT E. BARNHILL (Editor), *Geometry Processing for Design and Manufacturing*, Geometric Design Publications, SIAM, Philadelphia, PA, 1992, x + 211 pp., $25\frac{1}{2}$ cm. Price: Softcover $36.50.

This book contains a collection of nine papers relating to geometry processing, along with a bibliography on surface-surface intersection methods. Most of the papers are based on lectures given at a SIAM conference on geometric design held in Tempe, Arizona, in 1989. The editor defines geometry processing to be the calculation of geometric properties of already constructed curves, surfaces, and solids. His stated aim for the book is to spur a unifying development of the subject.

We paraphrase here the editor's descriptions of the papers: 1) R. Farouki develops special offset curves which can be parameterized by rational functions, 2) R. Barnhill, T. Frost, and S. Kersey use a combination of geometric and numerical techniques to find self-intersections of networks of general triangular or rectangular parametric patches, 3) J. Hoschek and F.-J. Schneider develop suitable approximations for conversions between B-spline surfaces, 4) G. Farin compares knot removal and degree reduction as tools for fairing B-spline curves and surfaces, 5) E. Brechner presents general envelope methods for determining offsets, 6) R. Barnhill, B. Bloomquist, and A. Worsey develop adaptive contouring algorithms for the contouring of surfaces which are networks of triangular polynomial patches, 7) L. Piegl discusses algorithms for dealing with surfaces having special mathematical forms (such as natural quadrics and extruded surfaces), 8) N. Patrikalakis develops surface-surface intersection algorithms for the implicit-parametric and parametric-parametric cases, and 9) K. Wang discusses intersection problems for rational parametric surfaces. The SSI bibliography of G. Farin contains about 50 articles.

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9[49M45, 49M40, 49M37, 03D15].—STEPHEN A. VAVASIS, *Nonlinear Optimization: Complexity Issues*, The International Series of Monographs on Computer Science, Vol. 8, Oxford Univ. Press, New York, 1991, x + 165 pp., 24 cm. Price $39.95.

This is a well-written, concise, and accurate book covering a range of subjects in nonlinear optimization and complexity. The writing style is lively and holds the reader's attention.

Chapter 1 contains introductory material concerning convexity and optimality conditions. Chapter 2 starts with a brief introduction to complexity theory, Turing machines and models of computation, the P and NP classes of problems, and NP-completeness. In addition, several problems are proved to be NP-complete, including the general quadratic programming problem.

Chapter 3 is devoted to convex quadratic programming. The author starts with a nice example, presenting a strongly polynomial-time algorithm for separable quadratic knapsack problems. Next, an interior-point algorithm is given