## CAMBRIDGE MONOGRAPHS ON APPLIED AND COMPUTATIONAL MATHEMATICS

Series Editors

P. G. CIARLET, A. ISERLES, R. V. KOHN, M. H. WRIGHT

## 23 Curve and Surface Reconstruction

The Cambridge Monographs on Applied and Computational Mathematics reflects the crucial role of mathematical and computational techniques in contemporary science. The series publishes expositions on all aspects of applicable and numerical mathematics, with an emphasis on new developments in this fast-moving area of research.

State-of-the-art methods and algorithms as well as modern mathematical descriptions of physical and mechanical ideas are presented in a manner suited to graduate research students and professionals alike. Sound pedagogical presentation is a prerequisite. It is intended that books in the series will serve to inform a new generation of researchers.

## Also in this series:

- 1. A Practical Guide to Pseudospectral Methods BENGT FORNBERG
- 2. Dynamical Systems and Numerical Analysis A. M. STUART AND A. R. HUMPHRIES
- 3. Level Set Methods and Fast Marching Methods
  J. A. SETHIAN
- 4. The Numerical Solution of Integral Equations of the Second Kind KENDALL E. ATKINSON
- 5. Orthogonal Rational Functions Adhemar Bultheel, Pablo González-Vera, Erik Hendiksen, and Olav Njåstad
  - 6. The Theory of Composites Graeme W. MILTON
  - 7. Geometry and Topology for Mesh Generation Herbert Edelsbrunner
  - 8. Schwarz–Christoffel Mapping Tofin A. Driscoll and Lloyd N. Trefethen
  - 9. High-Order Methods for Incompressible Fluid Flow M. O. Deville, P. F. Fischer, and E. H. Mund
    - 10. Practical Extrapolation Methods
      AVRAM SIDI
  - 11. Generalized Riemann Problems in Computational Fluid Dynamics
    MATANIA BEN-ARTZI AND JOSEPH FALCOVITZ
    - 12. Radial Basis Functions: Theory and Implementations
      MARTIN BUHMANN
    - 13. Iterative Krylov Methods for Large Linear Systems Henk A. van der Vorst
      - 14. Simulating Hamiltonian Dynamics BENEDICT LEIMKUHLER AND SEBASTIAN REICH
  - 15. Collocation Methods for Volterra Integral and Related Functional Equations
    HERMANN BRUNNER
    - 16. Topology for Computing AFRA J. ZOMORODIAN
    - 17. Scattered Data Approximation HOLGER WENDLAND
    - 19. Matrix Preconditioning Techniques and Applications KE CHEN

## **Curve and Surface Reconstruction: Algorithms with Mathematical Analysis**

TAMAL K. DEY
The Ohio State University



cambridge university press Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press The Edinburgh Building, Cambridge cb2 2ru, UK

Published in the United States of America by Cambridge University Press, New York www.cambridge.org

Information on this title: www.cambridge.org/9780521863704

© Tamal K. Dey 2007

This publication is in copyright. Subject to statutory exception and to the provision of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published in print format 2006

isbn-13 978-0-511-54686-0 OCeISBN

isbn-13 978-0-521-86370-4 hardback isbn-10 0-521-86370-8 hardback

Cambridge University Press has no responsibility for the persistence or accuracy of urls for external or third-party internet websites referred to in this publication, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

To my parents Gopal Dey and Hasi Dey and to all my teachers who taught me how to be a self-educator.