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Nota di contenuto	Free-Form Surface Construction in a Commercial CAD/CAM System -- Polyhedral Gauss Maps and Curvature Characterisation of Triangle Meshes -- Manifold Embedding of Graphs Using the Heat Kernel -- Detection of Surface Creases in Range Data -- Efficient Linear System Solvers for Mesh Processing -- Smoothing of Time-Optimal Feedrates for Cartesian CNC Machines -- Plausible 3D Colour Surface Completion Using Non-parametric Techniques -- Determining the Topology of Real Algebraic Surfaces -- Level Sets of Functions and Symmetry Sets of

Surface Sections -- An Heuristic Analysis of the Classification of Bivariate Subdivision Schemes -- Global Curve Analysis via a Dimensionality Lifting Scheme -- Conversion of Dupin Cyclide Patches into Rational Biquadratic Bézier Form -- Multi-sided Attribute Based Modeling -- On Normals and Control Nets -- Line Subdivision -- Euclidean Voronoi Diagrams of 3D Spheres: Their Construction and Related Problems from Biochemistry -- The Importance of Polynomial Reproduction in Piecewise-Uniform Subdivision -- A Hybrid Approach to Extracting Tooth Models from CT Volumes -- Bézier Surfaces of Minimal Internal Energy -- Positivity-Preserving Scattered Data Interpolation -- Artifacts in Box-Spline Surfaces -- Spatial Pythagorean Hodograph Quintics and the Approximation of Pipe Surfaces -- Modelling Surface Normal Distribution Using the Azimuthal Equidistant Projection -- New Trends in Digital Shape Reconstruction -- Backward Errors and Condition Numbers of Regular and Singular Points on Algebraic Curves -- Approximate Rational Parameterization of Implicitly Defined Surfaces -- Convergence Analysis of Discrete Differential Geometry Operators over Surfaces -- A Marching Method for Computing Intersection Curves of Two Subdivision Solids.

Sommario/riassunto

This volume collects the papers accepted for presentation at the 11th IMA Conference on the Mathematics of Surfaces, held at Loughborough University, 5th-7th September 2005. As with all earlier conferences in the series, contri- tors to this volume comefrom manycountries. The paperspresented herere'ect the interest in a subject of relevance to mathematics, engineering,and computer science, especially in domains such as computer-aided design, computer vision, and computer graphics. The papers in the present volume include eight invited papers, as well as a larger number of submitted papers. They cover a range of ideas from - derlying theoretical tools to industrial and medical uses of surfaces. The latter category includes such diverse topics as surfaces in car design, and modelling of teeth, while the former includes papers on Voronoi diagrams, linear systems, estimation of curvatures on meshes, operators on meshes, intersection of sub- vision surfaces, approximate parameterization,condition numbers, Pythagorean hodographs,artifactsinB-splinesurfaces,B´ eziersurfacesofminimalenergy,line subdivision, subdivision surfaces, level sets and symmetry, the topology of - gebraic surfaces, curve analysis, interpolation with positivity, and conversion of cyclides to NURBS. Other papers concentrate on particular algorithms arising from applications, such as embedding graphs in manifolds, recoveryof 3D shape from shading, ?nding optimal feedrates for machining, detection of creases in range data, and ?lling holes in range data. We would like to thank all those who attended the conference and helped to make it a success.