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**14. ABSTRACT**

The Final Proceedings for Fifth International Conference on Curves and Surfaces, 27 June 2002 - 3 July 2002

This conference will cover topics related to approximation theory including interpolation, smoothing techniques, splines, radial basis functions, wavelets as well as practical aspects of geometric modeling, computer-aided design and mechanics.



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Fifth International Conference organized by AFA-SMAI

# CURVES and SURFACES

June 27
July 3, 2002

Saint-Malo (France)

# PROGRAMME

Fifth International Conference

Organized by "AFA – SMAI" on

# Curves and Surfaces

# Programme

Saint-Malo, France

June 27 - July 3, 2002

# Acknowledgments

**This conference is organized by "Association Française d'Approximation" (AFA), an activity group of "Société de Mathématiques Appliquées et Industrielles" (SMAI),**

**in collaboration with the following institutions:**

- Université Joseph Fourier (Grenoble I),
- Institut National des Sciences Appliquées de Rennes,
- Université Pierre et Marie Curie (Paris VI),
- Université de Rennes I,
- Ecole Nationale Supérieure des Arts et Métiers de Lille,
- Université Paul Sabatier (Toulouse III),
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- Institut National des Sciences Appliquées de Rennes,
- Université Joseph Fourier (Grenoble I),
- Université Paul Sabatier (Toulouse III),
- Institut Universitaire de France (IUF),
- Centre National de la Recherche Scientifique (CNRS),
- Institut National de la Recherche en Informatique et Automatique (INRIA),
- European Mathematical Society.

**We wish to thank all of them for their contribution to the success of this conference.**

**The organizers:**

Albert Cohen, Université Pierre et Marie Curie, Paris, France,
Tom Lyche, University of Oslo, Norway,
Marie-Laurence Mazure, Université Joseph Fourier, Grenoble, France,
Jean-Louis Merrien, Institut National des Sciences Appliquées de Rennes, France,
Larry L. Schumaker, Vanderbilt University, Nashville, USA.

# Invited talks

| | |
|---|---|
| Thursday, June 27, 9:15-10:15 | *Encoding of Digitized Surfaces*<br>**R. A. DeVore**, University of South Carolina, Columbia (USA) |
| Thursday, June 27, 14:30-15:30 | *Interpolation by Translates of a Basic Function*<br>**Will Light**, University of Leicester (England) |
| Friday, June 28, 8:30-9:30 | *Marching on Triangulated Domains*<br>**R. Kimmel**, Technion, Haifa (Israel) |
| Friday, June 28, 14:30-15:30 | *Discretization of Certain Curves and Surfaces via Minimization of Energy or Lebesgue Constants*<br>**E. B. Saff**, Vanderbilt University, Nashville (USA) |
| Saturday, June 29, 8:30-9:30 | *Curve and Surface Meshing for Finite Element Applications*<br>**Paul-Louis George**, INRIA, Le Chesnay (France) |
| Monday, July 1, 8:30-9:30 | *Subdivision for Modeling and Simulation*<br>**Peter Schröder**, Caltech, Pasadena (USA) |
| Monday, July 1, 14:30-15:30 | *Constrained Fitting for Multiple Surfaces*<br>**Tamás Várady**, Computer and Automation Research Inst., Budapest (Hungary) |
| Tuesday, July 2, 8:30-9:30 | *Minkowski Geometric Algebra of Complex Sets*<br>**Rida T. Farouki**, University of California, Davis (USA) |
| Tuesday, July 2, 14:30-15:30 | *A Link between Statistics and Approximation Theory*<br>**Pascal Massart**, Université de Paris-Sud, Orsay (France) |
| Wednesday, July 3, 11:00–12:00 | *Sparse Geometrical Image Representations with Bandelets*<br>**Stéphane Mallat**, Ecole Polytechnique, Palaiseau (France) |

# Mini-symposia

## Radial Basis Functions and Applications

Thursday, June 27, 16:00, room Grand Bé

*Organizer* : Robert Schaback, University of Göttingen, Germany

*Speakers* : Michael J.D. Powell, University of Cambridge, UK
Michael Johnson, Kuwait University, Safat, Kuwait
Holger Wendland, University of Göttingen, Germany
Aurelian Bejancu, University of Leeds, UK
Greg Fasshauer, IIT, Chicago, USA

**Keywords:** *Radial basis functions, scattered data, interpolation, approximation, partial differential equations, neural networks, sphere.*

**Abstract:** Radial Basis Functions are a convenient and effective tool for constructing curves, surfaces, and general multivariate functions from scattered data. Their theory is closely connected to reproducing kernel Hilbert spaces, and their applications range from interpolation and approximation to neural networks and the numerical solution of partial differential equations.

Altogether, this conference will have about 20 contributions concerning radial basis functions and related topics. The talks can be grouped as follows:

1 . General
2 . Applications to PDE
3 . Zonal Functions on the Sphere
4 . Applications to Neural Networks or Wavelets

Due to space limitations, only the first group will form the minisymposium. However, participants are strongly encouraged to attend also the talks of the other groups.

## Surface Parameterization

Friday, June 28, 10:00, room Grand Bé

*Organizer* : Michael S. Floater, SINTEF, Blindern, Norway

*Speakers* : Craig Gotsman, Technion, Israel
Eric de Sturler, Urbana-Champaign, Illinois, USA
Mathieu Desbrun, Caltech, USA
Kai Hormann, University of Erlangen-Nüremberg, Germany
Hugues Hoppe, Microsoft, Redmond, USA

**Abstract:** A parametric surface is defined by a one-to-one mapping $\phi : \Omega \to \mathbb{R}^3$, with $\Omega \subset \mathbb{R}^2$ the parameter domain, and we call $\phi$ a *parameterization* of the surface $s = \phi(\Omega)$. This minisymposium deals with the construction of parameterizations of various kinds of surfaces: typically triangle meshes and more general polygonal meshes, but also point clouds. In practice, given $s$, we construct a mapping $\psi : s \to \mathbb{R}^2$ from the surface $s$ into the plane, and let $\phi = \psi^{-1}$.

Such parameterizations have many applications, among them: parametric scattered data fitting; triangulation of point clouds; texture mapping; morphing; remeshing; reparameterization of spline surfaces; and repair of CAD models. Parameterization is also closely related to grid generation for solving PDE's.

In most applications, a "good" mapping $\psi$ is one which is one-to-one and has low deformation in some sense. One of the main approaches is to take $\psi$ to be some approximation of a harmonic map, which minimizes Dirichlet energy and leads to the solution of a linear system. However, several issues arise, such as how to choose the boundary of the parameter domain or whether it should be generated automatically, when can we guarantee that $\psi$ is one-to-one, and whether non-linear methods can further reduce deformations. This minisymposium will hopefully provide some answers and will probably raise further questions.

# Effective Computational Geometry for Curves and Surfaces

Friday, June 28, 17:00, room Grand Bé

*Organizer* : Jean-Daniel Boissonnat, INRIA, Sophia-Antipolis, France

*Speakers* : Joachim Giesen, ETH, Zurich, Switzerland
Bernard Mourrain, INRIA, Sophia Antipolis, France
Jean-Marie Morvan, Université Claude Bernard, Lyon, France
Gert Vegter, University of Groningen, the Netherlands
Dinesh Manocha, University of North Carolina, Chapel Hill, USA

**Abstract:** Geometric computing plays a central role in most engineering activities: geometric modelling, computer aided design and manufacturing, computer graphics and virtual reality, scientific visualization, geographic information systems, molecular biology, fluid mechanics, and robotics are just a few well-known examples. The rapid advances in visualization systems, networking facilities and 3D sensing and imaging make geometric computing both dominant and more demanding of effective algorithmic solutions.

Computational geometry emerged as a discipline in the seventies and has met with considerable success in resolving the asymptotic complexity of basic geometric problems including data structures, convex hulls, triangulations, Voronoi diagrams, geometric arrangements and geometric optimisation. However, in the mid-nineties, it has been recognized that the applicability in practice of the computational geometry techniques was far from satisfactory and a vigorous effort has been undertaken to make computational geometry more effective.

The minisymposium illustrates some new research directions towards that goal.

B. Mourrain will discuss the interaction between computer algebra and geometry. Several operations on nonlinear geometric objects are equivalent to manipulating polynomials. Examples are boundary evaluation in solid modeling, proximity queries, robot motion planning and generalized Voronoi diagrams. A fundamental question is the solution of algebraic systems, ubiquitous in the construction of new objects, such as intersections, curve decompositions into monotone arcs, surface meshes. Besides modelling a rich class of objects, polynomials allow us to employ powerful and robust symbolic-numeric techniques in order to overcome the limitations of black-box solvers of standard computer algebra systems, which are not fast enough, cannot handle approximate data, nor exploit the underlying geometry.

Earlier algorithms dealing with algebraic primitives either use fixed precision arithmetic or techniques from symbolic computation. While the former can be inaccurate, the latter is considered too slow in practice. D. Manocha will present efficient representations and algorithms for reliable computations with algebraic numbers. These representations are used to efficiently perform geometric queries like inside/outside tests, which-side or orientation tests as well as solving univariate and multi-variate polynomial systems. The overall approach combines different techniques from symbolic computation based on exact arithmetic with floating point arithmetic. These include algebraic curve classification, multivariate Sturm sequences, and multi-polynomial resultants. The applications of the method is demonstrated to efficient and reliable computation of curve and surface intersections, boundary evaluation and medial axis computations. In practice, it is more than two orders of magnitude faster as compared to earlier implementations that produced reliable results. Some of the algorithms have been implemented as part of two public domain packages, MAPC and PRECISE.

Since algorithms for curves and surfaces are more involved, harder to ensure robustness, and typically several orders of magnitude slower than their linear counterparts, there is a need for approximate representations. J-M. Morvan will establish a link between classical differential geometry and discrete geometry. He will show how one can define discrete analogs of the usual geometric invariants (normals, areas, curvatures) for polyhedral surfaces and obtain approximation and convergence results.

Surface reconstruction from unorganised point sets has received considerable attention in the past but it is only very recently that theoretical results on the quality of these methods have been obtained in 2 and 3 dimensions. A major issue though is to be able to reconstruct surfaces with boundary, sharp features and singularities. Another important issue is the time and space requirements of the reconstruction algorithms since data sets typically consist nowadays of millions of points. J. Giesen will survey the most recent results in this rapidly evolving area.

Shape evolution through time involve to handle changes in topology and the occurrence of singularities upon deformation and a good understanding of these phenomena requires applying Morse theory and, more generally, singularity and catastrophe theory, which provide us with local universal models of change of form (bifurcations). G. Vegter will consider the important special case of apparent contours of smooth surfaces.

## Industrial Geometry

Saturday, June 29, 10:00, room Grand Bé

*Organizer* : Bert Jüttler, University of Linz, Austria

*Speakers* : Ray Sarraga, General Motors, Warren MI, USA
Thomas A. Grandine, Boeing, Seattle WA, USA
Gundolf Haase, University of Linz, Austria
Martin Peternell, Research Center Seibersdorf, Vienna, Austria
Steffen Wahl, ICEM, Herrenberg, Germany

**Keywords:** *Surface modification, parametric design, optimal sizing, object reconstruction, surface matching.*

**Abstract:** The talks in this minisymposium will focus on recent research dealing with problems which are related to industrial applications of computer aided geometric design. The five speakers, representing different industries and industry–related research, will present methods for generating, modifying and optimizing curves and surfaces, subject to design constraints and/or mechanical constraints. This includes methods for reconstructing geometrical objects from large data sets in computer vision, for optimizing the shape of an object subject to mechanical constraints in structural mechanics, and for modifying CAD models in order to adapt them to the results of numerical and/or practical simulations in automotive industry. Further topics to be addressed are the parametric design of objects in aircraft industry, and software tools for generating tangent and curvature continuous surfaces. It is hoped that this minisymposium will contribute to bridging the gap between the beautiful mathematics of curves and surfaces and their applications in industry.

## Sparse Grids

Saturday, June 29, 14:30, room Grand Bé

*Organizer* : Michael Griebel, University of Bonn, Germany

*Speakers* : Hans-Joachim Bungartz, University of Stuttgart, Germany
Jochen Garcke, University of Bonn, Germany
Markus Hegland, ANU, Canberra, Australia
Christoph Schwab, ETH, Zurich, Switzerland
Stefan Achatz, TUM, München, Germany

**Abstract:** Using so-called sparse grids, the discrete representation of a $d$-dimensional function employs only $O(N(\log N)^{d-1})$ grid points, where $N$ denotes the mesh-size in one dimension. The achieved accuracy is nearly the same as the one obtained on conventional uniform grids where $O(N^d)$ points must be used, provided that a certain smoothness prerequisite is fulfilled. Thus, sparse grids promise to break, at least to some extent, the curse of dimension for higher dimensional problems.

The basic idea can be traced back to Korobov and Smolyak. The approach is also known under the names (discrete) blending method, Boolean method, and hyperbolic cross points.

Meanwhile, very interesting applications of sparse grids have been developed which are reflected in this minisymposium. Here we discuss new sparse grid approaches for the efficient treatment of partial differential equations, for numerical integration, for data mining in the case of classification and regression, as well as for homogenization in mathematical modeling.

## Wavelet Approximation and Applications

Monday, July 1, 10:00, room Grand Bé

*Organizer* : Zuowei Shen, University of Singapore

*Speakers* : Christophe Bernard, Ecole des Mines de Paris, Fontainebleau, France
Thierry Blu, Ecole Polytechnique Fédérale, Lausanne, Switzerland
Albert Cohen, Université Pierre et Marie Curie, Paris, France
Wolfgang Dahmen, RWTH, Aachen, Germany
Amos Ron, University of Wisconsin, Madison, USA

**Keywords:** *Wavelet, frames, adaptive algorithms.*

**Abstract:** Wavelet approximations and their efficient applications rely on two basic ideas (i) the ability to choose adaptively and flexibly a 'best representation' of functions from a unified family of representers, and (ii) non-linear approximation theory and the corresponding algorithms based on the multiresolution analysis. This combination allows the formulation of efficient and robust tools to various applications.

In this symposium, we invite researchers and experts in the area to demonstrate the wide spectrum of wavelet approximation theory and its applications. The talks in the symposium are related to the following topics (i) the theory of wavelet frames and more general the theory of redundant systems in a generalized shift invariant space, (ii) adaptive multiscale approximation and optimizing basis search for the best approximation, (iii) wavelet methods for nonlinear problem and scattered data interpolation.

## Image Synthesis

Monday July 1, 17:00, room Grand Bé

*Organizer* : François Sillion, INRIA, Grenoble, France

*Speakers* : Michael Stark, University of Utah, USA
Leif Kobbelt, Aachen University of Technology, Germany
Craig Gotsman, Technion, Israel
François Sillion, iMAGIS - GRAVIR/IMAG INRIA, France

**Abstract:** This minisymposium is focused on the usage of curves and surfaces for image synthesis. The "traditional" paradigm in which objects were modeled using surface descriptors (polygons, parametric or implicit surfaces), then animated and rendered is being challenged by recent scientific and technological advances. In particular, the various applications of image synthesis call for adapted surface models, ranging from parametric descriptions to point samples, with an additional desire for intermadiate levels of complexity over a wide range of simplifications. In this minisymposium we will hear about the use of multi-resolution splines for rendering, in a consistent framework that joins shape modeling and lighting simulation; high quality rendering from point sampled geometry, a particularly challenging form of description for continuous surfaces; efficient rendering of progressive meshes; and the simplification of very complex 3D models using sets of billboards.

## Nonlinear Approximation

Tuesday, July 2, 10:00, room Grand Bé

*Organizer* : V.N. Temlyakov, University of South Carolina, Colombia, USA

*Speakers* : Vladimir Temlyakov, University of South Carolina, Columbia, USA
Gérard Kerkyacharian, Université Paris, France
Dung Dinh, Vietnam National University, Hanoï, Vietnam
Anna Kamont, IMPAS, Sopot, Poland
Rémi Gribonval, IRISA-INRIA, Rennes, France

**Keywords:** *Nonlinear approximation, greedy basis, quasi-greedy basis, democratic basis, Haar basis, duality.*

**Abstract:** Our main interest is nonlinear approximation. The basic idea behind nonlinear approximation is that the elements used in the approximation do not come from a fixed linear space but are allowed to depend on the function being approximated. While the scope of this minisymposium is mostly theoretical, we should note that this form of approximation appears in many numerical applications such as adaptive PDE solvers, compression of images and signals, statistical classification, and so on. The standard problem in this regard is the problem of $m$-term approximation where one fixes a basis and looks to approximate a target function by a linear combination of $m$ terms of the basis. When the basis is a wavelet basis or a basis of other waveforms, then this type of approximation is the starting point for compression algorithms. We are interested in the quantitative aspects of this type of approximation. Namely, we want to understand the properties (usually smoothness) of the function which govern its rate of approximation in some given norm (or metric). We are also interested in stable algorithms for finding good or near best approximations using $m$ terms. Some of earlier work has introduced and analyzed such algorithms. More recently, there has emerged another more complicated form of nonlinear approximation which we call highly nonlinear approximation. It takes many forms but has the basic ingredient that a basis is replaced by a larger system of functions that is usually redundant. Some types of approximation that fall into this general category are mathematical frames, adaptive pursuit (or greedy algorithms) and adaptive basis selection. Redundancy on the one hand offers much promise for greater efficiency in terms of approximation rate, but on the other hand gives rise to highly nontrivial theoretical and practical problems. With this motivation, our recent work and the current activity focuses on nonlinear approximation both in the classical form of $m$-term approximation (where several important problems remain unsolved) and in the form of highly nonlinear approximation where a theory is only now emerging.

## Subdivision Techniques, Recent Trends and Applications

Tuesday, July 2, 17:00, room Grand Bé

*Organizer* : Leif Kobbelt, Aachen University of Technology, Germany

*Speakers* : Charles Loop, Microsoft, Redmond WA, USA
Martin Rumpf, University of Duisburg, Germany
Joe Warren, Rice University, Houston TX, USA
Denis Zorin, New York University, New York NY, USA

**Keywords:** *Subdivision surfaces, polygon meshes.*

**Abstract:** Many subdivision schemes for smooth freeform surface generation have been developed over the last two decades. Today, the basic theoretic questions about the smoothness analysis and approximation properties have been solved and there is an extensive repository of techniques available to solve the most common geometric design problems. In the current state of maturity, subdivision surfaces are starting to be integrated in commercially available modeling systems due to their improved flexibility compared to classical CAD representations based on NURBS.

In this mini-symposium some of the subdivision pioneers and other well-known researchers are reporting on their recent developments in this area. The four talks put highlights on respective results which are prototypic for the very active research area of subdivision surfaces.

*Charles Loop* from Microsoft Research is presenting his latest results on generalized subdivision schemes which are able to handle meshes that are made out of a mixture of triangles and quads. These schemes coincide with well-known standard schemes in all-triangle or all-quad regions but still guarantee $C^1$ smoothness in regions where triangles and quads meet.

*Martin Rumpf* (Duisburg University) demonstrates a new approach to variational subdivision – a technique where shape optimization (fairing) is combined with the subdivision mesh refinement paradigm. His approach is based on a geometric filter operation that models the evolution of a membrane surface over time.

*Joe Warren* (Rice University) presents a new and simple scheme for the exact generation of surfaces of revolution. This is one of the major requirements if subdivision surfaces are to be used in real life CAD applications since many technical parts are of this type.

Finally, *Denis Zorin* (New York University) reports on his latest results concerning the application of subdivision surfaces in the context of numerical simulation. Many of these problems such as 3D deformation can be reduced to 2D boundary integral equations. Hence, in order to use subdivision surfaces as a boundary representation, we have to derive quadrature rules for integrating functions defined on subdivision surfaces.

# 3D-Meshing for Simulation and Visualization

Wednesday, July 3, 8:30, room Grand Bé

*Organizer* : Günther Greiner, University of Erlangen-Nüremberg, Germany

*Speakers* : Chris Johnson, University of Utah, Salt Lake City, USA
Martin Rumpf, University of Duisburg, Germany
Roberto Grosso, University of Erlangen-Nüremberg, Germany
Günther Greiner, University of Erlangen-Nüremberg, Germany

**Abstract:** Meshing of two-dimensional objects is a well-established procedure and widely used for displaying and analyzing surfaces. In addition it is a basis for refining and coarsening the geometry, e.g. by subdivision and mesh reduction algorithms respectively. Moreover, meshing produces a discretization of the 2D-object, thus making it accessible to numerical simulations, e.g. by a finite element analysis. This very last aspect is for three-dimensional domains even more important, particularly with regard to applications. Therefore, in recent years much attention has been given to the generation, manipulation and administration of 3D-meshes. The performance of numerical simulations as well as visualization algorithms crucially depends on the size and the quality of the mesh.

In the minisymposium we report on recent developments in the area of 3D-meshing. Special attention will be given to the integration of simulation and visualization, to the generation, storage and administration of adaptive grids as well as to subdivision methods for 3D meshes. The focus of these presentations is not restricted to the theoretical concepts. Instead, concrete examples from technical application fields as well as from medicin will play an important role.

# Thursday Morning

9:00–9:15 **Welcome. Room : Grand Bé**

9:15–10:15 Plenary Session

Room : **Grand Bé**

*Encoding of Digitized Surfaces*
**R. A. DeVore**

Chair : Marie-Laurence Mazure

10:15–10:45 Coffee Break

| Room : **Fréhel**<br>Chair : Rida Farouki | Room : **Grand Bé**<br>Chair : Joe Warren | Room : **Grouin**<br>Chair : Ron DeVore |
|---|---|---|
| 10:45 **Olivier Gibaru*, Jean-Charles Fiorot**<br>*(SBR) Surfaces with Base Points* | 10:45 **Helmut Pottmann**<br>*A Geometric Approach to Optimization with Moving and Deformable Objects* | 10:45 **K. Höllig*, J. Hörner, A. Kopf**<br>*Finite Element Approximation with Splines* |
| 11:10 **Pascal J. Frey*, Houman Borouchaki**<br>*Simplification of Terrains by Minimization of the Local Deformation* | 11:10 **Helmut Pottmann, Stefan Leopoldseder***<br>*Recognition and Reconstruction of Translational Surfaces and Ruled Surfaces* | 11:10 **Tanya M. Morton**<br>*Two Approaches for Solving Pseudodifferential Equations on Spheres using Spherical Radial Basis Functions* |
| 11:35 **V. Skytt*, S. Briseid**<br>*Tangent Plane Continuity between Adjacent Parametric Surfaces* | 11:35 **Heidrun Mühlthaler*, Helmut Pottmann**<br>*Classical Geometric Methods for the Computation of Minkowski Sum Boundary Surfaces* | 11:35 **A. Crampton, D. Lei*, J.C. Mason**<br>*A Fast Algorithm for Solving a Linearized SVM Problem* |
| 12:00 **Julien Villard*, Houman Borouchaki**<br>*Cloth Simulation Using Adaptative Meshing* | 12:00 **Rida T. Farouki, Carla Manni, Alessandra Sestini***<br>*Spatial $C^2$ PH Quintic Spline Curves* | 12:00 **L. De Floriani*, M. Lee**<br>*Incremental Selective Refinement on Hierarchical Tetrahedral Meshes* |

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Speaker*

# Thursday Afternoon

14:30–15:30 Plenary Session

Room : **Grand Bé**

Chair : Carl de Boor

*Interpolation by Translates of a Basic Function*
**Will Light**

15:30–16:00 Coffee Break

Room : **Fréhel**
Chair : Tamas Varady

16:00 **Nira Dyn, Michael S. Floater, Armin Iske***
*Adaptive Thinning for Bivariate Scattered Data*

16:25 **M. Luzon, E. Pavlov, M. Bercovier***
*Reverse Engineering from Noisy Data of Objects Defined by Algebraic Surface Patches*

16:50 **Serban D. Porumbescu, Peer-Timo Bremer*, Bernd Hamann, Kenneth I. Joy**
*Automatic Construction of B-spline Surfaces from Adaptively Sampled Distance Fields*

17:15 **Chris Venter, Ben Herbst***
*Structure from Motion Using a Nonlinear Kalman Filter*

17:40 **Leonardo Traversoni**
*Projective and Quaternionic Reconstruction of Objects*

Room : **Grand Bé**
Chair : Robert Schaback

16:00 **M.J.D. Powell**
*Radial Basis Function Interpolation on Manifolds*

16:25 **Michael J. Johnson**
*Employing Dilation in RBF Interpolation to Increase Robustity*

16:50 **Francis J. Narcowich, Joseph D. Ward, Holger Wendland***
*Refined Error Estimates for Radial Basis Function Interpolation*

17:15 **A. Bejancu**
*Semi-Cardinal Interpolation for Multivariable Splines*

17:40 **Greg Fasshauer**
*Approximate Moving Least-Squares Approximation: A Fast and Accurate Multivariate Approximation Method*

Room : **Grouin**
Chair : Carla Manni

16:00 **Paolo Costantini*, Carla Manni**
*Geometric Construction of Spline Curves with Tension Properties*

16:25 **Mladen Rogina*, Tina Bosner**
*A de Boor Type Algorithm for Tension Splines*

16:50 **F. Feraudi**
*Surface Least Square Approximation: a Shape Preserving Approach*

17:15 **A. Crampton, D.P. Jenkinson, S.C. Kendall*, J.C. Mason**
*Shape Preserving Approximation with Large Sets of Scattered Data*

17:40 **B. Kvasov**
*Difference Method for Constructing Shape-Preserving Spline Approximations*

18:15 **Welcome party**

# Friday Morning

8:30–9:30 Plenary Session

Room : **Grand Bé**

Chair : Michel Bercovier

*Marching on Triangulated Domains*
**R. Kimmel**

9:30–10:00 Coffee Break

Room : **Fréhel**
Chair : Paul-Louis George

10:00 **André Lieutier**
*Medial Axis Homotopy*

10:25 **Nguyen Dong Ha**
*A Practical Approach to Manipulating Topological Maps*

10:50 **F. Gannaz*, B. Lacolle**
*Convex Approximation and Norm Approximation*

11:15 **Joab R. Winkler*, Ronald N. Goldman**
*The Sylvester Resultant Matrix for Bernstein Polynomials*

11:40 **Zur Izhakiyan*, Alfred Inselberg**
*Polynomial Curves in Parallel Coordinates : Results and Constructive Algorithm*

12:05 **H. Wang*, J. Kearney, K. Atkinson**
*Arc-Length Parameterized Spline Curves for Real-Time Simulation*

Room : **Grand Bé**
Chair : Michael Floater

10:00 **Craig Gotsman**
*Spectral Methods for Parametrization of 2D and 3D Meshes and Applications in Morphing*

10:25 **Eric de Sturler**
*Accuracy and Algorithmic Issues in Surface Parameterization*

10:50 **Mathieu Desbrun**
*Smooth Parameterization of Meshes and Applications*

11:15 **Kai Hormann**
*Triangulating Unorganized Points*

11:40 **X. Gu, S. Gortler, H. Hoppe***
*Geometry Images*

Room : **Grouin**
Chair : Christophe Rabut

10:00 **David Donoho, Nira Dyn, Peter Schröder, Victoria Stodden***
*Multiresolution Representation and Subdivision on Curves and Surfaces in Symmetric Spaces*

10:25 **Nira Dyn*, David Levin, Jo Simoens**
*Face Value Subdivision Schemes on Triangulations*

10:50 **Paul Sablonnière**
*Algorithms for Tensor Products of $C^1$ Merrien Subdivision Schemes*

11:15 **C. Conti, G. Zimmermann***
*Interpolatory Vector Subdivision Schemes*

11:40 **J. de Villiers, K. Goosen*, B. Herbst**
*Dubuc-Deslauriers Subdivision for a Finite Interval*

12:05 **Valery A. Zheludev*, Amir Z. Averbuch**
*Interpolatory Subdivision Schemes Generated by Splines*

# Friday Afternoon

14:30–15:30 Plenary Session — Room : **Grand Bé** — Chair : Dany Leviatan

*Discretization of Certain Curves and Surfaces via Minimization of Energy or Lebesgue Constants*
**E. B. Saff**

15:30–17:00 Coffee Break and Plenary Poster Session
(See next page)

Room : **Fréhel**
Chair : Jörg Peters

17:00 **K. Karčiauskas*, J. Peters**
*Tensor-Border Nets and Patches*

17:25 **K.-H. Brakhage**
*Fast Approximation for Tensor Product Structures with Applications for Blending*

17:50 **K.-H. Brakhage, F. Bramkamp, Ph. Lamby*, S. Müller**
*B-Spline based Grid Generation and Grid Representation for H-adaptive Finite Volume Discretizations*

18:15 **Martin Bertram*, Hans Hagen**
*Recursively Generated Graph Surfaces*

18:40 **Stephen Mann**
*Polynomial Precision Clough-Tocher Interpolants*

Room : **Grand Bé**
Chair : Jean-Daniel Boissonnat

17:00 **Joachim Giesen**
*Recent Achievements in Delaunay Based Surface Reconstruction*

17:25 **B. Mourrain**
*Algebraic Methods for Implicit Curves and Surfaces*

17:50 **J-M. Morvan**
*Approximation of the Curvatures of a Smooth Surface*

18:15 **Gert Vegter**
*Evolution of Apparent Contours of Smooth Surfaces*

18:40 **Dinesh Manocha**
*Efficient and Accurate Computations with Algebraic Primitives for Geometric Applications*

Room : **Grouin**
Chair : Will Light

17:00 **W. zu Castell**
*Decomposition of the Inverse Fourier Transform of 1-radial Functions and Derivatives*

17:25 **Jungho Yoon**
*Error Estimates for Radial Basis Function Interpolation in Sobolev Spaces*

17:50 **T. Werther**
*Characterization of Semi-Hilbert Spaces with Application in Scattered Data Interpolation*

18:15 **W. Chen**
*Kernel and Wavelet RBFs Based on Fundamental and General Solutions of Partial Differential Equations*

18:40 **H. N. Mhaskar**
*A Converse Theorem for Approximation by Gaussian Networks*

# Friday Afternoon

15:30–17:00

# Plenary Poster Session

**D. Amar*, B. Mourrain, M. Yvinec**
*Approximating an Implicit Curve or Surface*

**L. Amodei**
*Reproducing Kernels and Differential Riccati Equations*

**Alexander Belyaev**
*Taylor Series Methods for Curvature Estimation and Curvature Extrema Detection*

**C.S. Chen*, C.H. Ho, Xin Li**
*Quasi-interpolation Using Radial Basis Functions for Poisson Problems*

**Sung Woo Choi**
*Monotone-Visibility: a Non-differentiable Generalization of Semi-convexity for Planar Shapes*

**Laurent Demaret*, Armin Iske**
*Adaptive Thinning in Image Compression*

**Patrick Chenin, Rémi Dessarce***
*Ray Casting by Subdividing Algebraic Equations*

**Françoise Foucher*, Paul Sablonnière**
*Bimonotonicity Preserving Surfaces Defined by Tensor Products of $C^1$ Merrien Subdivision Schemes*

**R. Goldenthal*, M. Bercovier**
*Spline Curve Approximation and Design by Optimal Control over the Knots*

**Aram Gòmez Neri**
*Quaternion Splines and Projective Duality.*

**D. Apprato, D. Ducassou, C. Gout*, E. Laffon**
*A Segmentation Process under Interpolation Conditions*

**I.P. Ivrissimtzis*, H-P. Seidel**
*Subdivision Rules for n-dimensional Simplicial Complices*

**M. Khachan*, F. Guibault**
*Medial Surface Reconstructions on Profiled Interpolated NURBS Surfaces*

**S. Meignen*, V. Perrier**
*Texture Scale and Image Segmentation Using Wavelet Filters*

**Laureano Gonzalez–Vega, Ioana Necula, Jaime Puig–Pey***
*Manipulating 3D Implicit Surfaces by using Differential Equation Solving and Algebraic Techniques*

**B. Jüttler, J. Schicho, M. Shalaby***
*Spline Implicitization of Planar Curves*

**Yuan Y. Tang*, X. C. Feng**
*A Wavelet-based Approach to Harmonic Transformation*

**A. Mazroui, D. Sbibih, A. Tijini***
*A New Method for Computing a Composite PS Finite Element of Class $C^k$*

**E. Vanraes*, A. Bultheel**
*Overview of Powell–Sabin Spline Subdivision and Wavelets*

**Y.A. Vershinin**
*Three-Dimensional Digital Surface Reconstruction*

# Saturday Morning

8:30–9:30 Plenary Session

Room : **Grand Bé**

Chair : Wolfgang Dahmen

*Curve and Surface Meshing for Finite Element Applications*
**Paul-Louis George**

9:30–10:00 Coffee Break

Room : **Fréhel**
Chair : Ron Kimmel

10:00 **M. Sabin*, L. Barthe**
*The Analysis and Control of Artifacts in Subdivision Surfaces*

10:25 **Günther Nürnberger**
*Local Lagrange Interpolation by Cubic Splines on Triangulations*

10:50 **V. Borrelli, F. Cazals*, J-M. Morvan**
*On the Angular Defect of Triangulations and the Pointwise Approximation of Curvatures*

11:15 **J. Gahleitner*, B. Jüttler, J. Schicho**
*Approximate Parameterization of Planar Cubic Curve Segments*

11:40 **A. Sheffer**
*A Priori and a Posteriori Measurement of Parameterization Error*

12:05 **F. Guibault*, P. Labbé, M. Khachan, H. Deddi**
*Efficient Arc Length Computation of Trimming NURBS Curve on a NURBS Surface*

Room : **Grand Bé**
Chair : Bert Jüttler

10:00 **Ramon F. Sarraga**
*Automatic Surface Modification Based on Finite-Element Node Displacements*

10:25 **Thomas A. Grandine*, Thomas A. Hogan**
*Parametric Design using High-Accuracy Hermite Interpolation*

10:50 **G. Haase*, U. Langer, E. Lindner, W. Mühlhuber**
*Optimal Sizing and Shape Optimization in Structural Mechanics*

11:15 **M. Peternell**
*Reconstructing Objects with Planar Faces*

11:40 **S. Wahl**
*Tangent and Curvature Continuous Matching of Surface Patches from the Practical Point of View*

Room : **Grouin**
Chair : Ed Saff

10:00 **Andreas Lorange, Knut Mørken***
*Stable Spline Wavelets on Nonuniform Knots*

10:25 **T. Sauer**
*Approximation Order of Refinable Functions via Quotient Ideals of Laurent Polynomials*

10:50 **E. Quak**
*Computation of Nonuniform Spline Wavelets*

11:15 **A. Petukhov**
*Wavelet Frames and Their Applications to Wireless Transmission*

11:40 **Thomas P.-Y. Yu**
*Nonlinear Pyramid Transforms and Nonlinear Subdivision Schemes Based on Median-Interpolation: some Recent Results*

12:05 **J. K. Eberharter, B. Ravani***
*Curves and Surfaces on Study's Quadric*

# Saturday Afternoon

## Room : **Fréhel**
Chair : Günther Nürnberger

14:30 **G.D. Vassilatos, A.I. Ginnis, P.D. Kaklis***
*Spatial Geometric Interpolation*

14:55 **J. Kozak, E. Žagar***
*Geometric Interpolation by Cubic Polynomials*

15:20 **Frank Zeilfelder**
*Lagrange Interpolation by Splines on Triangulated Quadrangulations*

15:45 **A. Mazroui*, D. Sbibih, A. Tijini**
*A Recursive Computation of Tensor Product Hermite Spline Interpolants*

16:10 **T. Dokken**
*Power Expansion of Tangent Lengths in High Accuracy Cubic Hermite Ellipse Approximation*

16:35 **John M. Sullivan**
*Curvature Measures for Discrete Surfaces*

## Room : **Grand Bé**
Chair : Michael Griebel

14:30 **H.-J. Bungartz*, S. Dirnstorfer**
*Adaptive Numerical Integration Using Sparse Grids*

14:55 **J. Garcke*, M. Griebel**
*Classification and Regression with Sparse Grids*

15:20 **M. Hegland*, O. Nielsen**
*Sparse Grid Least Squares Fitting Using the Combination Technique*

15:45 **Christoph Schwab**
*Two-scale Regularity and Sparse Grids for Homogenization Problems*

16:10 **S. Achatz*, C. Zenger**
*Higher Order Sparse Grid Methods for Elliptic Partial Differential Equations with Variable Coefficients*

## Room : **Grouin**
Chair : Nira Dyn

14:30 **Jüri Lippus**
*On Wavelet Coefficients of Functions*

14:55 **F. Pitolli**
*A New Family of Wavelets on the Interval*

15:20 **S. Dahlke, G. Steidl*, G. Teschke**
*Coorbit Spaces and Banach Frames on Homogeneous Spaces*

15:45 **Gerlind Plonka**
*A DCT-like Transform that Maps Integers to Integers*

16:10 **Bin Han**
*Symmetry Properties in a Subdivision Scheme*

16:35 **Vladimir D. Liseikin**
*Geometrical and Numerical Analysis of Comprehensive Grid Generators*

# Monday Morning

8:30–9:30 Plenary Session

Room : **Grand Bé**

Chair : Michael Powell

*Subdivision for Modeling and Simulation*
**Peter Schröder**

9:30–10:00 Coffee Break

Room : **Fréhel**
Chair : Tor Dokken

10:00 **H. Gonska**
*On an Algorithm for Bernstein Polynomials*

10:25 **Abedallah Rababah**
*Jacobi-Bernstein Basis Transformation*

10:50 **Marshall Walker**
*CAGD Approximation and Interpolation in 2-Manifolds*

11:15 **T. Ju, F. Losasso, S. Schaefer, J. Warren***
*Dual Contouring of Hermite Data*

11:40 **Byung-Gook Lee*, Yunbeom Park, Jaechil Yoo**
*Legendre-Bernstein Basis Transformations and their Applications*

12:05 **J. M. Carnicer*, M. Gasca**
*On Chung and Yao's Geometric Characterization for Bivariate Polynomial Interpolation*

Room : **Grand Bé**
Chair : Zuowei Shen

10:00 **C. Bernard*, S. Mallat, J-J. Slotine**
*Scattered Data Wavelet Interpolation*

10:25 **Thierry Blu*, Michael Unser, Philippe Thévenaz**
*Optimizing Basis Functions For Best Approximation*

10:50 **A. Cohen*, B. Matei**
*Edge-Adapted Nonlinear Multiresolution Representations*

11:15 **A. Cohen, W. Dahmen*, R. DeVore**
*Adaptive Wavelet Methods for Nonlinear Problems*

11:40 **Amos Ron*, Zuowei Shen**
*Generalized Shift-Invariant Spaces*

Room : **Grouin**
Chair : Malcolm Sabin

10:00 **R.K. Beatson**
*Mollification Formulas and Implicit Smoothing*

10:25 **M. Bozzini*, L. Lenarduzzi, R. Schaback**
*Adaptive Bivariate Interpolation by Multiquadrics Perturbed in Scale and Shape*

10:50 **D.P. Jenkinson*, J.C. Mason**
*Approximation with Transformed Radial Basis Functions*

11:15 **B. Bacchelli*, M. Bozzini, C. Rabut**
*A Multiresolution Analysis using Polyharmonic Splines*

11:40 **G. Allasia**
*A Scattered Data Approximation Scheme for the Multidimensional Poisson Equation by Cardinal Radial Basis Interpolants*

12:05 **Olga Holtz*, Amos Ron**
*Beyond the Classical Theory of Approximation Orders*

# Monday Afternoon

14:30–15:30 Plenary Session

Room : **Grand Bé**

Chair : Klaus Höllig

*Constrained Fitting for Multiple Surfaces*
**Tamás Várady*, Pál Benkő**

15:30–17:00 Coffee Break and Plenary Poster Session
(See next page)

Room : **Fréhel**
Chair : Pascal Massart

17:00 **Michael S. Floater**
*Mean Value Coordinates*

17:25 **Valérie Pham-Trong**
*Convex Combination Maps over Triangulations, Tilings, and Tetrahedralizations*

17:50 **Géza Kós*, Tamás Várady**
*Parametrising Complex Triangular Meshes*

18:15 **William Martin*, Elaine Cohen**
*Surface Completion of an Irregular Boundary Curve Using a Concentric Mapping*

18:40 **Bruno Lévy*, Sylvain Petitjean**
*Least Squares Conformal Maps*

Room : **Grand Bé**
Chair : François Sillion

17:00 **Michael M. Stark*, Elaine Cohen, Tom Lyche, Richard F. Riesenfeld**
*Multi-Resolution Splines for Rendering*

17:25 **L. Kobbelt**
*Efficient High Quality Rendering of Point Sampled Geometry*

17:50 **C. Gotsman**
*Efficient Rendering of Progressive Polygonal Meshes*

18:15 **Xavier Decoret, François Sillion***
*Extreme Simplification using Multiple Billboards*

Room : **Grouin**
Chair : Gerlind Plonka

17:00 **Joachim Stöckler**
*On the Construction of Tight Affine Frames on Bounded Intervals*

17:25 **Peter G. Binev**
*Adaptive Tree Approximation for Progressive Compression of Surfaces*

17:50 **V. Maxim**
*Denoising Signals Observed on a Random Design*

18:15 **D. Castaño Díez*, A. Kunoth**
*Adaptive Data Fitting Based on Wavelets*

18:40 **M. Randrianarivony*, G. Brunnett**
*A Multiresolution Method for Detecting Higher Order Discontinuities from Irregular Noisy Samples.*

# Monday Afternoon

15:30–17:00

## Plenary Poster Session

**A. Agathos**
*Techniques for Surface Reconstruction*

**G. Allègre*, B. Lacolle**
*Arrangement of Lines in the Euclidean Plane: Representation and Topology*

**Paolo Costantini, Isabella Cravero*, Carla Manni**
*Constrained Interpolation by Frenet Frame Continuous Quintics*

**Maxim Fradkin*, Jean-Michel Rouet**
*Fast Logical Operations on 2-Simplex Meshes*

**E. Guérin*, E. Tosan, A. Baskurt**
*Flexible Approximation of Rough Surfaces with a Fractal Model*

**C. Guerrini*, L.B. Montefusco**
*A Wavelet Method for fMRI Data Reconstruction*

**M. Hoffmann*, I. Juhász**
*Application of Knot Modification in Cubic B-spline Design*

**H. Wang, J. Kearney*, K. Atkinson**
*Robust and Efficient Computation of the Closest Point on a Spline*

**A. Averbuch, Y. Keller***
*Image Registration Using Parametric Surfaces and Pixel Diffusion*

**Ulf Labsik*, Günther Greiner**
*Using Cubic Interpolation for the Extraction of Isosurfaces from Tetrahedral Grids*

**Lin-Tian Luh**
*Sobolev Spaces and Native Spaces*

**Jean-Louis Maltret*, Marc Daniel**
*Local Analysis of Polyhedral Surfaces*

**Laura Gori, Laura Pezza***
*Wavelets Bases on the Interval and Applications*

**Eva Paola Rechy Muñoz**
*Reconstruction and Animation of Surfaces*

**H. Render**
*Polysplines – A New Method in CAGD*

**Ioannis Ivrissimtzis, Christian Rössl*, Hans-Peter Seidel**
*Recursive Connectivity Encoding for Mesh Stripification*

**Chang Shu*, Gerhard Roth**
*Constructing B-spline Surfaces from Multiple Images*

**Salvatore Spinello*, Günther Greiner**
*Automatic Contour Line Recognition From Scanned Topographic Maps*

**Luiz Velho*, Adelailson Peixoto**
*Multiresolution Mesh Generation using Combined Simplification/Refinement*

# Tuesday Morning

8:30–9:30 Plenary Session

Room : **Grand Bé**

Chair : Helmut Pottmann

*Minkowski Geometric Algebra of Complex Sets*
**Rida T. Farouki**

9:30–10:00 Coffee Break

## Room : Fréhel
Chair : Ulrich Reif

10:00 **G. Albrecht**
*Conic Sections within CAD Systems*

10:25 **J. M. Carnicer, E. Mainar*, J. M. Peña**
*A Unified Framework for Cubics and Cycloids*

10:50 **G. Casciola, S. Morigi***
*Inverse Spherical Surfaces with Applications to Geometric Modelling*

11:15 **Rick Beatson, Jeremy Levesley*, Will Light**
*Fast Evaluation of Radial Basis Functions on the Sphere*

11:40 **V. Michel**
*Multiscale Evaluation of Geosatellite Data*

12:05 **Facundo Mémoli, Guillermo Sapiro***
*Distance Functions and Geodesics on Implicit and Unorganized Points Hypersurfaces*

## Room : Grand Bé
Chair : Vladimir Temlyakov

10:00 **S.J. Dilworth, N.J. Kalton, D. Kutzarova, V.N. Temlyakov***
*The Thresholding Greedy Algorithm, Greedy Bases, and Duality*

10:25 **Gérard Kerkyacharian*, Dominique Picard**
*Geometric Properties of Bases and Statistical Estimation Problems*

10:50 **Dinh Dung**
*Stalibity in Periodic Multi-Wavelet Decomposition and Non-Linear Compression/Recovery*

11:15 **A. Kamont*, V.N. Temlyakov**
*Greedy Approximation and Multivariate Haar System*

11:40 **R. Gribonval*, M. Nielsen**
*Approximation with Spline Generated Framelets*

## Room : Grouin
Chair : David Levin

10:00 **Angela Kunoth**
*Solving Linear–Quadratic Elliptic Control Problems by Wavelet Techniques*

10:25 **Richard H. Bartels, Faramarz F. Samavati***
*Constructing Multiresolutions from Subdivisions : Local Techniques Using Masks*

10:50 **Ming C. Lin**
*Fast Penetration Depth Computation Using Dual-Space Expansion, Hierarchical Refinement and Rasterization Hardware*

11:15 **G. Morin**
*Computation for Curved Objects Using Subdivision*

11:40 **T. Deschamps*, L.D. Cohen, S.M. Ebeid**
*Fast Surface and Tree Structure Extraction of Vascular Objects in 3D Medical Images*

12:05 **Catalina Ibañez**
*Quaternion Wavelets and Medical Imaging*

# Tuesday Afternoon

14:30–15:30 Plenary Session

Room : **Grand Bé**

Chair : Amos Ron

*A Link between Statistics and Approximation Theory*
**Pascal Massart**

15:30–17:00 Coffee Break and Plenary Poster Session
(See next page)

Room : **Fréhel**
Chair : Panagiotis Kaklis

17:00 **Jörg Peters**
*Enclosures of Curved Geometry and their Applications*

17:25 **Alon Spira*, Ron Kimmel**
*Geodesic Curvature Flow on Parametric Surfaces*

17:50 **G. Casciola, F. Fabbri, L.B. Montefusco***
*Exploiting Matrix Structure in Curve Intersection Problems*

18:15 **P. Chenin*, M. Khachan**
*Discrete Geometrical Tools for CAGD Problems*

18:40 **Éric Guilbert*, Éric Saux, Marc Daniel**
*A Hierarchical Structure for Locating Intersections in Large Sets of B-spline Curves*

Room : **Grand Bé**
Chair : Leif Kobbelt

17:00 **Charles Loop**
*Smooth Trinary Subdivision of Triangle Meshes*

17:25 **M. Rumpf**
*A Geometric Evolution Perspective for Subdivision and Surface Modeling*

17:50 **G. Morin, J. Warren*, H. Weimer**
*A Subdivision Scheme for Surfaces of Revolution*

18:15 **D. Zorin**
*Solving Boundary Integral Equations on Subdivision Surfaces*

Room : **Grouin**
Chair : Elaine Cohen

17:00 **P. Costantini, F. Pelosi***
*Constrained Bivariate Histosplines*

17:25 **P. Costantini, M. L. Sampoli***
*A General Scheme for Constrained Curve Interpolation*

17:50 **L. Schiavon**
*Interpolation Problems Using Conic Splines With Monotone Curvature.*

18:15 **S. Kersey**
*Near-Interpolation with Arbitrary Constraints*

18:40 **Xie-Hua Sun**
*On Cubic Algebraic Curve Interpolation with Geometric Contraints*

# Tuesday Afternoon

15:30–17:00

## Plenary Poster Session

**V.I. Berdyshev**
*On Extremal Problems of Navigation and Approximation of Surfaces*

**T. Chaperon**
*Surface Fitting Validation Using Regression Analysis*

**C. Conti*, R. Morandi, C. Rabut**
*Univariate Monotone Smoothing of Noisy Discontinuous Data*

**N.A. Dodgson*, I.P. Ivrissimtzis, M.A. Sabin**
*Characteristics of Dual $\sqrt{3}$ Subdivision Schemes*

**C. Gérot*, D. Attali, A. Montanvert**
*From a Triangular Mesh to Surfaces Blended by Means of a Convex Combination*

**A. Ardeshir Goshtaby**
*Control-Line Curves*

**M.F. Hassan*, N.A. Dodgson**
*Ternary and Three-point Univariate Subdivision Schemes*

**P. Sablonnière, M. J. Ibáñez*, D. Barrera**
*Near-best Spline Quasi-Interpolants on Uniform and Nonuniform Partitions in One and Two Dimensions*

**Edward Kansa*, Leevan Ling**
*Block Toeplitz Matrices and their Applications to Radial Basis Function Problems*

**Masanori Kimura*, Fujio Yamaguchi**
*Homogeneous Newton-Raphson Methods for Complex Roots*

**A. Kivinukk*, G. Tamberg**
*Approximation by Generalized Sampling Series*

**Zhenquan Li*, Gordon Mallinson**
*The Stream Surface in Flow Visualization Based on Space Curve Theory*

**X. Li*, R. J. Cripps**
*Estimation of Curvatures from 3D Scattered Point Data*

**Ioana M. Martin**
*Interactive Modeling with Multiresolution Subdivision Surfaces*

**O. Nouisser*, D. Sbibih, P. Sablonnière**
*Pairs of B-splines with Small Support on the Four Directional Mesh Generating a Partition of Unity*

**Giulio Casciola, Lucia Romani***
*Rational Interpolants with Tension Parameters*

**L. Desbat, S. Roux*, P. Grangeat, A. Koenig**
*Efficient Sampling in Dynamic Tomography*

**Sergey F. Svinyin*, Andrey V. Skourikhin, Nadezhda A. Andreeva**
*Spectral Method of Curves Nodes Distribution with B-splines Interpolation*

**Zong Min Wu**
*A Meshless Method for the Numerical Solution of PDEs by using Quasi–interpolation for Scattered Data*

# Wednesday Morning

Room : **Fréhel**
Chair : Knut Mørken

8:30 **Ulrich Reif**
*On the Solubility of Fairing Problems*

8:55 **J. Levesley, C. Odell, D. L. Ragozin***
*Variational Interpolation on Compact Homogeneous Manifolds: the Norming Set Approach*

9:20 **S. Dekel, D. Leviatan***
*On the Relations between Piecewise Polynomial and Rational Approximation in $L^p(\mathbb{R}^2)$*

9:45 **S. Dekel**
*On Multivariate Nonlinear Approximation Spaces*

10:10 **Karol Dziedziul**
*Cardinal Interpolation*

10:35–11:00 Coffee Break

Room : **Grand Bé**
Chair : Günther Greiner

8:30 **C. Johnson**
*Meshing for the Computational Science Pipeline: Modeling, Simulation, and Visualization*

8:55 **M. Rumpf**
*Adaptive Grid Methods for Image Defined Domains*

9:20 **R. Grosso**
*Preprocessing, Simulation and Visualization on Adaptive Meshes*

9:45 **G. Greiner**
*Regular 3D Subdivision Methods for Simulation and Visualization*

Room : **Grouin**
Chair : Peter Schröder

8:30 **Adi Levin**
*Construction of Non-Uniform Stationary Subdivision Schemes*

8:55 **Adi Levin, David Levin***
*Smoothness Analysis of Quasi-Uniform Subdivision Schemes*

9:20 **P. Oswald**
*Smoothness of Nonlinear Subdivision Based on Median Interpolation*

9:45 **K. Goosen, J. Gravesen*, J. de Villiers**
*The Length of Subdivision Curves*

10:10 **Daniel Lemire**
*A Family of 4-Points Dyadic High Resolution Subdivision Schemes*

11:00–12:00 Plenary Session

Room : **Grand Bé**
Chair : Joachim Stöckler

*Sparse Geometrical Image Representations with Bandelets*
**Erwan Le Pennec, Stéphane Mallat***

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Jenkinson D.P. : Monday, 10:50
Jenkinson D.P. : Thursday, 17:15
Johnson C. : Wednesday, 8:30
Johnson Michael J. : Thursday, 16:25
Joy Kenneth I. : Thursday, 16:50
Ju T. : Monday, 11:15
Juhász I. : Monday, 15:30
Jüttler B. : Friday, 15:30
Jüttler B. : Saturday, 11:15
Kaklis P.D. : Saturday, 14:30
Kalton N.J. : Tuesday, 10:00
Kamont A. : Tuesday, 11:15
Kansa Edward : Tuesday, 15:30
Karčiauskas K. : Friday, 17:00
Kearney J. : Friday, 12:05
Kearney J. : Monday, 15:30
Keller Y. : Monday, 15:30
Kendall S.C. : Thursday, 17:15
Kerkyacharian Gérard : Tuesday, 10:25
Kersey S. : Tuesday, 18:15
Khachan M. : Friday, 15:30
Khachan M. : Saturday, 12:05
Khachan M. : Tuesday, 18:15
Kimmel R. : Friday, 8:30
Kimmel Ron : Tuesday, 17:25
Kimura Masanori : Tuesday, 15:30
Kivinukk A. : Tuesday, 15:30
Kobbelt L. : Monday, 17:25
Koenig A. : Tuesday, 15:30
Kopf A. : Thursday, 10:45
Kós Géza : Monday, 17:50
Kozak J. : Saturday, 14:55
Kunoth A. : Monday, 18:15
Kunoth Angela : Tuesday, 10:00
Kutzarova D. : Tuesday, 10:00
Kvasov B. : Thursday, 17:40
Labbé P. : Saturday, 12:05

Labsik Ulf : Monday, 15:30
Lacolle B. : Friday, 10:50
Lacolle B. : Monday, 15:30
Laffon E. : Friday, 15:30
Lamby Ph. : Friday, 17:50
Langer U. : Saturday, 10:50
Le Pennec Erwan : Wednesday, 11:00
Lee Byung-Gook : Monday, 11:40
Lee M. : Thursday, 12:00
Lei D. : Thursday, 11:35
Lemire Daniel : Wednesday, 10:10
Lenarduzzi L. : Monday, 10:25
Leopoldseder Stefan : Thursday, 11:10
Levesley J. : Wednesday, 8:55
Levesley Jeremy : Tuesday, 11:15
Leviatan D. : Wednesday, 9:20
Levin Adi : Wednesday, 8:30
Levin Adi : Wednesday, 8:55
Levin David : Friday, 10:25
Levin David : Wednesday, 8:55
Lévy Bruno : Monday, 18:40
Li X. : Tuesday, 15:30
Li Xin : Friday, 15:30
Li Zhenquan : Tuesday, 15:30
Lieutier André : Friday, 10:00
Light Will : Thursday, 14:30
Light Will : Tuesday, 11:15
Lin Ming C. : Tuesday, 10:50
Lindner E. : Saturday, 10:50
Ling Leevan : Tuesday, 15:30
Lippus Jüri : Saturday, 14:30
Liseikin Vladimir D. : Saturday, 16:35
Loop Charles : Tuesday, 17:00
Lorange Andreas : Saturday, 10:00
Losasso F. : Monday, 11:15
Luh Lin-Tian : Monday, 15:30
Luzon M. : Thursday, 16:25
Lyche Tom : Monday, 17:00
Mainar E. : Tuesday, 10:25
Mallat S. : Monday, 10:00
Mallat Stéphane : Wednesday, 11:00
Mallinson Gordon : Tuesday, 15:30
Maltret Jean-Louis : Monday, 15:30
Mann Stephen : Friday, 18:40
Manni Carla : Monday, 15:30
Manni Carla : Thursday, 12:00
Manni Carla : Thursday, 16:00
Manocha Dinesh : Friday, 18:40
Martin Ioana M. : Tuesday, 15:30
Martin William : Monday, 18:15
Mason J.C. : Monday, 10:50
Mason J.C. : Thursday, 11:35
Mason J.C. : Thursday, 17:15
Massart Pascal : Tuesday, 14:30
Matei B. : Monday, 10:50
Maxim V. : Monday, 17:50
Mazroui A. : Friday, 15:30
Mazroui A. : Saturday, 15:45
Meignen S. : Friday, 15:30
Mémoli Facundo : Tuesday, 12:05
Mhaskar H. N. : Friday, 18:40
Michel V. : Tuesday, 11:40
Montanvert A. : Tuesday, 15:30
Montefusco L.B. : Monday, 15:30
Montefusco L.B. : Tuesday, 17:50
Morandi R. : Tuesday, 15:30
Morigi S. : Tuesday, 10:50
Morin G. : Tuesday, 11:15
Morin G. : Tuesday, 17:50
Mørken Knut : Saturday, 10:00
Morton Tanya M. : Thursday, 11:10
Morvan J-M. : Friday, 17:50
Morvan J-M. : Saturday, 10:50
Mourrain B. : Friday, 15:30
Mourrain B. : Friday, 17:25
Mühlhuber W. : Saturday, 10:50
Mühlthaler Heidrun : Thursday, 11:35
Müller S. : Friday, 17:50
Narcowich Francis J. : Thursday, 16:50
Necula Ioana : Friday, 15:30
Nielsen M. : Tuesday, 11:40
Nielsen O. : Saturday, 15:20
Nouisser O. : Tuesday, 15:30
Nürnberger Günther : Saturday, 10:25
Odell C. : Wednesday, 8:55
Oswald P. : Wednesday, 9:20
Park Yunbeom : Monday, 11:40
Pavlov E. : Thursday, 16:25
Peixoto Adelailson : Monday, 15:30
Pelosi F. : Tuesday, 17:00
Peña J. M. : Tuesday, 10:25
Perrier V. : Friday, 15:30
Peternell M. : Saturday, 11:15
Peters J. : Friday, 17:00
Peters Jörg : Tuesday, 17:00
Petitjean Sylvain : Monday, 18:40
Petukhov A. : Saturday, 11:15
Pezza Laura : Monday, 15:30
Pham-Trong Valérie : Monday, 17:25
Picard Dominique : Tuesday, 10:25
Pitolli F. : Saturday, 14:55
Plonka Gerlind : Saturday, 15:45
Porumbescu Serban D. : Thursday, 16:50
Pottmann Helmut : Thursday, 10:45
Pottmann Helmut : Thursday, 11:10
Pottmann Helmut : Thursday, 11:35
Powell M.J.D. : Thursday, 16:00
Puig–Pey Jaime : Friday, 15:30
Quak E. : Saturday, 10:50
Rababah Abedallah : Monday, 10:25
Rabut C. : Monday, 11:15