

Resume of Xianming Chen

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Ph.D. Thesis

Dynamic Geometric Computation with B-splines



Some positive comments from journal reviewers (by permission of the editor)

- (1) Let me start by stating that I like this work....
- (2) ...The paper is a pioneering work and interesting, ...
- (3) ... This work makes a significant contribution to the state-of-the-art of geometric

Expertise

Differential Geometry, Geometric Modeling, Computational Geometry, Graphics

Major C++ Packages

- Alpha11 C++ rewriting of Alpha1, a geometric modeling package developed in 1980s (team work)
- SciFeed Automatic optimal design of CAD part vibratory bowl feeders (team work).
- sShape Geometric modeling with NURBS; click here for some images.
- euler C++ implementation of Euler operators from M. Mantyla's classical book.
- x-scanner A minimal scan conversion renderer
- x-ray Recursive ray tracing and physically realistic path tracing

Journal Publication

Algorithm for Direct Multiplication of B-splines

Xianming Chen, Richard Riesenfeld, Elaine Cohen

To appear in IEEE Transactions on Automation Science and Engineering, 2007.

Theoretically Based Algorithms for Robustly Tracking Intersection Curves of Deforming Surfaces

Xianming Chen, Richard Riesenfeld, Elaine Cohen, James Damon

Computer-Aided Design, Volume 39, Issue 5, May 2007, Pages 389-397

Complexity Reduction for Symbolic Computation with Rational B-splines

Xianming Chen, Richard Riesenfeld, Elaine Cohen

To appear in International Journal of Shape Modeling

Mold Accessibility via Gauss Map Analysis


Gershon Elber, Xianming Chen, Elaine Cohen

ASME Transactions, Journal of Computing & Information Science in Engineering, June 2005:79-85.

Conference Publication


Sliding Windows Algorithm for B-spline Multiplication

Xianming Chen, Richard Riesenfeld, Elaine Cohen

ACM Proceeding of Solid and Physical Modeling, 2007. 


Tracking Intersection Curves of Two Deforming Surfaces

Xianming Chen, Richard Riesenfeld, Elaine Cohen, James Damon

Springer-Verlag Lecture Notes in Computer Science 4077 (GMP 2006): 101-114 


Dynamic Point-Curve Critical Distances

Xianming Chen, Elaine Cohen, Richard Riesenfeld

Springer-Verlag Lecture Notes in Computer Science 4077 (GMP 2006): 87-100 

Degree Reduction for NURBS Symbolic Computation on Curves

Xianming Chen, Richard Riesenfeld, Elaine Cohen

Proceedings of IEEE Shape Modeling and Applications 2006: 182-193 

Rational Bézier Patch Differentiation using the Rational Forward Difference Operator

Xianming Chen, Richard F. Riesenfeld, Elaine Cohen

Proceedings of IEEE Computer Graphics International 2005: 129-134. 

Mold Accessibility via Gauss Map Analysis

Gershon Elber, Xianming Chen, Elaine Cohen

Proceedings of IEEE Shape Modeling Applications 2004:263-272. 

Project Summaries

- (2007) Developed algorithms for computing horizontally-restricted convex hull.
- (2007) Developed algorithms for determining minimal half plane support of polyhedron
- (2007) Developed smart sampling algorithms for computing surface arrangement.
- (2004-2007) Programming of surface modeling package *sShape*.
- (2002-2005) Programming of solid modeling research packages *alpha1* and *alpha11*.
- (2006) Implemented Euler operators as described in Martti Mantyla's classical book.
- (2006) Designed efficient NURBS multiplication algorithm via blossoming.
- (2006) Tracking dynamic surface-surface intersection based on the singularity theory.
- (2006) Tracking dynamic point-curve distance based on the singularity theory.
- (2006) Extended singularity theory of distance function to smooth curves to piecewise case.
- (2005) Achieved dramatic degree reduction for NURBS symbolic computation on curves.
- (2005) Extended *polynomial* forward difference to *rational* B-spline control polygons.
- (2004) Developed algorithms for detecting topology change of silhouette to partition mold.

Provisional Patents

(2007) Topological-Based Sampling Algorithm for Part Feeding

(2007) Computing Minimal Half Plane Support by Radial Partition of Contact Set

Professional Experience

(2007) Consultant as Lead Scientist, Siemens Technology-To-Business center, USA

(2002 - 2006) Research Assistant, School of Computing, University of Utah, USA

(2004 Summer) Instructor, High School Program, Columbia University, USA

(2001 - 2002) Teaching Assistant, Computer Science Department, University of Utah, USA

(1998 - 2001) Research Assistant, Computer Science Department, Nankai University, China

(1992 - 1997) Lecturer of Physics, Tianjin Institute of Construction, China

(1989 - 1991) Assistant Lecturer of Physics, Tianjin Institute of Construction, China

Professional Service

Peer Review for Computer-Aided Design, Elsevier, since 2006

Review for ACM Solid and Physical Modeling 2007

Program Committee, Intl. Conf. on Foundations of Computer Science 2007

Program Committee, Intl. Conf. on Computer Graphics and Virtual Reality 2007

Professional Preparation for a Computer Scientist

Computer Science Ph.D.(Winter 2007) University of Utah., USA

Computer Engineering M.S. (2001) Nankai University, China

Nuclear Physics Post Graduate Program (1989) Nanjing University, China

Nuclear Electronics B.S. (1987) University of Science and Technology of China, China

How to pronounce my first name

“Xianming” is pronounced as “shianming”. Some of my old non Asian friends also simply call me “ming”.