



Resume of Xianming Chen

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Ph.D. Thesis

An Application of Singularity Theory to Robust Geometric Calculation of Interactions Among Dynamically Deforming Geometric Objects  

Some comments from journal reviewers

- (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

Research Areas

Computer Aided Design, Computer Aided Geometric Design, Geometric Modeling, Computational Geometry, Computational Tology, Graphics, Visualization

Major Academic Contribution

Presented a systematic approach to robust geometric computation on continuous geometric objects that combines singularity analysis and numeric computation

Developed robust algorithms for dynamic surface intersection that guarantee both topological correctness and numeric efficiency

Developed the first efficient and direct algorithm for B-spline multiplication

Increased dramatically the efficiency of B-spline symbolic computation

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, October 2009.

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

International Journal of Shape Modeling, Volume 13, Issue 1, June 2007, Pages 25 - 49

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: 265-276

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

Tracking 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

(2008-2009) Intelligent Feature Adaptation in a History-Based Feature Modeling System.

(2007-2008) Developed smart sampling algorithms for computing surface arrangement.

(2007-2008) Developed algorithms for computing horizontally-restricted convex hull.

(2007) Developed algorithms for determining minimal half plane support of polyhedron

(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.

(2004-2007) Programming of surface modeling package

(2003-2004) Developed algorithms for detecting topology change of silhouette.

(2002-2005) Programming of solid modeling research packages *alpha1* and *alpha11*.

Provisional Patents

(2007) Topological-Based Sampling Algorithm for Part Feeding

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

Professional Experience

(2008 -) R&D, SolidWorks, USA

(2007 - 2008) Lead Scientist, Consultant for 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

Appointment on Technical Committees of International Scientific Organizations

Technical Committee on Computer Graphics, the International Association of Science and Technology for Development (IASTED), term 2009 - 2012

Peer Review Experience

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

Peer review for Intl J. of Computational Geometry and Applications, since 2008

Peer review for Computational and Applied Mathematics, Elsevier, since 2008

Guest review for ACM Solid and Physical Modeling 2007

Serve on Program Committees of International Conferences

Program Committee, IASTED Intl. Conf. on Computer Graphics and Imaging 2010

Program Committee, ISCA Intl. Conf. on Computer Application in Industry and Engineering 2009

Conference Advisory Board, CAD 2009

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.(2008) 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