## **CURRICULUM VITAE**

# Mr. Yanlai Chen

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## **Education:**

09/2002 - 05/2007:	Ph.D. in Applied Mathematics, School of Mathematics, University of Minnesota, Minneapolis, MN, U.S.A., Major: Numerical Analysis. Advisor: Professor Bernardo Cockburn
09/2006 - 05/2007:	M.S. in Computer Science, Department of Computer Science and Engineering, University of Minnesota, Minneapolis, MN, U.S.A. Advisor: Professor Stergios Roumeliotis
09/1997 - 07/2002:	B.S. Department of Mathematics, University of Science & Technology of China (USTC), Hefei, China

### **Research Interests:**

Numerical Analysis, Hamilton-Jacobi-like equations and applications, Adaptive numerical methods, Sparse matrix computations, Data exploration, Path planning in Robotics, Flow in porous media.

# **Research Experience and Projects:**

06/03 – 08/03 09/05 – 12/05 09/06 – 12/06	Research Assistant to Professor. Bernardo Cockburn Work on "Adaptive, high-order numerical methods for Hamilton-Jacobi equations." Developed an adaptive numerical method for Hamilton-Jacobi equations. The method solves the equations efficiently, introduces a new idea to estimate the error and generates meshes by an adaptive algorithm that achieves any order of accuracy with strict error control and optimal computational complexity. Major applications include: mathematical finance, computer graphics, level set methods and terrain navigation.
Spring 2005	Worked on a class project on data exploration: Conducted Gene Expression Analysis by SVD/PCA on Yeast Sporulation Time Series Data and Cancer Gene Expression Data.
Fall 2005	Worked on two class projects on computer networks: Designed a Peer-to-Peer file sharing system and IP network emulation.

## **Industrial Experience:**

07/05 – 08/05: Summer Intern at Minneapolis Consulting Group, Minneapolis, Minnesota. Worked with utility consultants and software developers to analyze a transmission congestion management tool in electrical networks. Built the core computing part involving data analysis and sparse matrix computation. Estimated the runtime of the system.

## **Awards and Honors:**

2006	Summer School Travel Award, Center for Nonlinear Analysis, Carnegie Mellon University.
2006	Travel Award, School of Mathematics, University of Minnesota.
1997 – 2001	USTC Excellent Student Scholarships.

## **Publications:**

#### Theses:

- 1. Y. Chen, *Some Numerical Experiments on Burgers Equation*, B.S. Dissertation, University of Science and Technology of China, May 2002.
- 2. Y. Chen, An adaptive high order discontinuous Galerkin method with error control for the Hamilton-Jacobi equations, Ph. D. Dissertation, University of Minnesota, May 2007.

#### Paper Submitted:

Y. Chen, B. Cockburn, An adaptive high order discontinuous Galerkin method with error control for the Hamilton-Jacobi equations. Part I: the one dimensional steady state case. J. Comput. Phys.

#### **Paper in Preparation:**

Y. Chen, B. Cockburn, An adaptive high order discontinuous Galerkin method with error control for the Hamilton-Jacobi equations. Part II: the two dimensional steady state case.

## **Presentations in Meetings:**

**1.** 7th World Congress on Computational Mechanics, Los Angeles, CA, July 16-22, 2006. *An Adaptive Discontinuous Galerkin Method with error control for the Hamilton-Jacobi Equations.* 

### To Be Held:

- **1.** SIAM Conference on Computational Science and Engineering, Costa Mesa, CA, February 19-23, 2007. *An Adaptive High-order Discontinuous Galerkin Method for the Hamilton-Jacobi Equations.*
- 2. International Conference On Spectral and High Order Methods, Beijing, China, June 18-22, 2007. An Adaptive High-order Discontinuous Galerkin Method with error control for the Hamilton-Jacobi Equations.

## **Courses Attended:**

2006 CNA summer School, Probabilistic and Analytical Perspectives on Contemporary PDEs, Center for Nonlinear Analysis, Carnegie Mellon University, Pittsburgh, PA. May 29 - June 06, 2006.

# **Teaching Experience:**

09/02 - 05/03:	Grader for Basic Theory of Probability and Statistics, Introduction to Stochastic Processes and Introduction to Topology.
09/03 - 12/03:	Recitation Instructor for Calculus II.
01/04 - 05/04:	Recitation Instructor for College Algebra and Probability.
09/04 - 12/04:	Recitation Instructor for Precalculus II.
01/05 - 05/05:	Grader for <i>Mathematical Modeling and Methods of Applied Mathematics</i> and Tutor for undergraduate students.
01/06 - 05/06:	Recitation Instructor for Precalculus II.