

# CURRICULUM VITAE

## CHIU-YEN KAO

**Department of Mathematics and Computer Science,  
Claremont McKenna College**  
206 Adams Hall, 850 Columbia Avenue  
Claremont, CA 91711

Email: Ckao@Claremontmckenna.edu  
Office Phone: (909) 607-1066  
Cell Phone: (626) 715-6017

### EDUCATION

- Ph.D., *Mathematics*, University of California, Los Angeles June 2004  
*Dissertation: Fast sweeping methods for static Hamilton-Jacobi equations*  
Advisor: Stanley Osher
- M.S., *Applied Mechanics*, National Taiwan University June 1999
- B.S., *Mathematics with a minor in Physics*, National Taiwan University June 1997

### RESEARCH EXPERIENCE

- *Visiting Associate Professor* (Math & Computer Science, Claremont McKenna College) Sept. 2011 ~ now
- *Associate Professor* (Math, OSU) Oct. 2010 ~ now  
Perform over the full range of responsibilities: research, teaching, and service.
- *Assistant Professor* (Math, OSU) Sept. 2006 ~ Sept. 2010  
Perform over the full range of responsibilities: research, teaching, and service.
- *IMA Industrial Postdoc* (IMA, UMN) Sept. 2004 ~ Aug. 2006  
Pursue interdisciplinary mathematical research at the IMA, especially in the areas of inverse problems and computational anatomy.
- *Faculty Mentor* (IPAM, UCLA) Jun. 2004 ~ Aug. 2004  
Advise students to do a summer research project in image processing for Areté Associates which is an advanced science and engineering company that provides innovative solutions to the most challenging technical problems faced by the United States (IPAM Research in Industrial Projects for Students (RIPS))
- *Research Assistant / Associate* (Math, UCLA) Apr. 2002 ~ Jun. 2004  
Research on the numerical methods for Hamilton-Jacobi equations and Level Set applications on optimization problems
- *Research Assistant* (Applied Mechanics, National Taiwan University) Sept. 1997 ~ Jun. 1999  
Research on Percolation theory and its application to random resistor network

### TEACHING EXPERIENCE

- *Visiting Associate Professor* (Math & Computer Science, Claremont McKenna College) Sept. 2011 ~  
Math 32 Calculus III spring, 2012  
Math 182 Partial Differential Equations spring, 2012  
Math 31 Calculus II fall 2011  
Math 111 Ordinary Differential Equations fall 2011
- *Associate Professor* (Math, OSU) Oct. 2010 ~  
Math 865L Topics in Applied Mathematics: Math Biology Spring 2011  
Math 809 Numerical Method for Partial Differential Equations III Spring 2011  
MBI Special Course: Numerical Methods for Partial Differential Equations and Their Applications in Biology Winter 2011

- **Assistant Professor** (Math, OSU) Sep. 2006 ~ Sept 2010
  - Math 865L Topics in Applied Mathematics: Math Biology Spring 2010
  - Math 350 Introduction to Mathematical Biology Spring 2010
  - Math 415 Ordinary Differential Equations and Partial Differential Equations Spring 2010
  - Math 865L Topics in Applied Mathematics: Math Biology Spring 2009
  - Math 809 Numerical Method for Partial Differential Equations III Spring 2009
  - Math 807 Numerical Method for Partial Differential Equations I Autumn 2008
  - Math 865 Topics in Applied Mathematics: Image Processing Spring 2008
  - Math 415 Ordinary Differential Equations and Partial Differential Equations Autumn 2007
  - Math 809 Numerical Methods for Partial Differential Equations III Spring 2007
  - Math 572 Linear Algebra with Application II Winter 2007
  - Math 571 Linear Algebra with Application I Fall 2006
- **Teaching Assistant /Associate** (UCLA) Apr. 2000 ~ Mar. 2002
  - Math 31B Calculus and Analytic Geometry
  - Math 32A & 32B Calculus of Several Variables
  - Math 61 Introduction to Discrete Structures
  - Math 135A & 135B Ordinary Differential Equations
  - Math 151B Applied Numerical Methods
  - Math 266A Applied Ordinary Differential Equations
  - Math 269A Advanced Numerical Analysis
- **Teaching Assistant** (Applied Mechanics, National Taiwan University) Sept. 1998 ~ Jun. 1999
  - Course: Applied Partial Differential Equations

## **GRANTS**

- Northrop Grumman Corporation MOU: Application of level set numerical methods to the design of optical metamaterials 10/01/10-09/30/12
- NSF Grant DMS 0811003: Shape and topological optimization on elliptic eigenvalue problems in inhomogeneous media (PI) 07/01/08-06/30/11
- Alfred P. Sloan Research Fellowship 09/16/09-09/15/11
- OSU CCTS NCTMP Y3 Method Development Award: Mathematical and computational approaches to study burn propagation and intervention (co-PI) 09/01/10-08/30/11
- NIH grant NEI K23EY019097: In vivo evaluation of Presbyopia (consultant & mentor) 05/01/09-04/30/14

## **RESEARCH INTERESTS**

- Shape Optimization for Eigenvalue Problems
- Numerical Methods for Hyperbolic Equations and Dispersive Equations
- Mathematical Biology
- Level Set Methods and its Applications
- Numerical Analysis and Scientific Computing

## **SUPERVISED Ph.D. STUDENTS**

- Ying Wang, Ph.D., 2010, The Ohio State University.  
Thesis: *Central Schemes for the modified Buckley-Leverett equation*  
Current Position: Postdoc, Department of Mathematics, University of Minnesota at Twin Cities.
- Shu Su, Ph.D., 2010, The Ohio State University.  
Thesis: *Numerical approaches on shape optimization of elliptic eigenvalue problems and shape study of human brains*  
Current Position: Risk Analyst, Market Risk Analytics Department, American Electric Power

## **PRESENTATIONS**

- Department of Mathematics, University of California, Irvine Jan. 2012  
*I. Integro-differential Equations for Biomedical Image Processing and Modeling*  
*II. An Efficient Rearrangement Algorithm for Shape Optimization Problem Involving Principal Eigenvalue in Population Dynamics*
- Taida Institute for Mathematical Sciences, National Taiwan University Jan. 2012  
*I. Principal Eigenvalue Minimization for an Elliptic Problem with Indefinite Weight and Robin Boundary Conditions*  
*II. Closest Point Method for Eigenvalue Optimization on Surfaces*
- Department of Mathematics, National Ysing Hua University Jan. 2012  
*Principal Eigenvalue Minimization for an Elliptic Problem with Indefinite Weight and Robin Boundary Conditions*
- Workshop on Mathematical Models of Electrolytes with Application to Molecular Biology, Taida Institute for Mathematical Sciences, National Taiwan University Jan. 2012  
*A Moving Boundary Model Motivated by Electric Breakdown*
- Department of Mathematics, University of Southern California Dec. 2011  
*Principal Eigenvalue Minimization for an Elliptic Problem with Indefinite Weight and Robin Boundary Conditions*
- Department of Mathematics, University of California, Los Angeles Nov. 2011  
*An efficient algorithm for shape optimization of eigenvalue problems on surfaces*
- AWM 40 Years and Counting: AWM's Celebration of Woman in Mathematics, Brown University, Providence Sept. 2011  
*Bounded domain problem for the modified Buckley-Leverett Equation*
- 7<sup>th</sup> International Congress on Industrial and Applied Mathematics, Vancouver, Canada July. 2011  
*An efficient algorithm for shape optimization of eigenvalue problems on surfaces*
- Workshop on Surface Computing and Closest Point Method, Vancouver, Canada July. 2011  
*Recent numerical methods for shape optimization of eigenvalue problems in inhomogeneous structures for both regular and irregular domains*
- NCTS summer short course, Taipei, Taiwan Jun. 2011  
*Introduction to Shape Optimization for Elliptic Eigenvalue Problems*
- Department of Mathematics, Wright State University Apr. 2011  
*Numerical methods for shape optimization of eigenvalue problems in inhomogeneous structures*
- Special Session on Recent Advances in Hyperbolic and Kinetic Problems, AMS meeting, Iowa Mar. 2011  
*Central Schemes for the Modified Buckley-Leverett Equation*

- Department of Mathematics, Portland State University Mar. 2011  
*Mathematical tools in Biomedical Image Processing*
- Computing in Image Processing, Computer Graphs, Virtual Surgery, and Sports, IMA, UMN Mar. 2011  
*Split Bregman Method for Minimization of Region-Scalable Fitting Energy for Image Segmentation*
- Department of Electrical and Computer Engineering, The Ohio State University Feb. 2011  
*Split Bregman Method for Minimization of Region-Scalable Fitting Energy for Image Segmentation*
- Advancing Numerical Methods for Viscosity Solutions and Applications BIRS, Canada Feb. 2011  
*Split Bregman Method for Minimization of Region-Scalable Fitting Energy for Image Segmentation*
- Department of Mathematics, Claremont McKenna College Jan. 2011  
*Numerical Methods for Shape Optimization of Eigenvalue Problems in Inhomogeneous Structure*
- Department of Mathematics, University of Michigan, Ann Arbor Dec. 2010  
*A pseudo-spectral method with window technique for initial value problems of KP equation*
- Numerical Solutions of Partial Differential Equations: Fast Solution Techniques Nov. 2010  
*An Efficient Rearrangement Algorithm for Shape Optimization on Eigenvalue Problems*
- Applied Math Colloquium, Department of Mathematics, UCLA Oct. 2010  
*Numerical study of the KP equation for non-periodic waves*
- Level Set Seminar, Department of Mathematics, UCLA Oct. 2010  
*An efficient rearrangement algorithm for shape optimization on eigenvalue problems*
- IMA Hot Topics Workshop: Medical Device-Biological Interactions at the Material Tissue Interface, IMA University of Minnesota at Twin Cities Sept. 2010  
*Mathematical tools in biomedical image processing*
- Summer Course of Image Science, Taiwan Aug. 2010  
*Connectome: Fiber connectivity in the white matter regions*
- SIAM Annual Meeting at Pittsburg, Pennsylvania Jul. 2010  
*A pseudo-spectral method with window technique for initial value problems of KP equation*
- The Second International Conference: Nonlinear Waves – Theory and Applications, Beijing Jun. 2010  
*KP solitons: Part 3. Simulations*
- Symmetry Plus Integrability 2010, South Padre Travelodge, South Padre Island, Texas Jun. 2010  
*A pseudo-spectral method with window technique for initial value problems of KP equation*
- Computational and Mathematical Methods in Science and Engineering, UWM, Madison May. 2010  
*Central Schemes for the Modified Buckley-Leverett Equation*  
*Modeling oxygen transport in surgical tissue transfer*
- SIAM Great Lakes Conference: Modeling and Numerical PDEs in Mathematical Biology, University of Michigan-Dearborn, Dearborn, MI Apr. 2010  
*Modeling oxygen transport in surgical tissue transfer*
- Department of Mathematics, Graz University, Austria Mar. 2010  
*Numerical Methods for Capturing Non-classical Shock Solutions of the Modified Buckley-Leverett Equation*
- Department of Mathematics, Purdue University Nov. 2009  
*A Spectral Method with Window Technique for the Initial Value Problems of Kadomtsev-Petviashvili Equation*
- Department of Mathematics, University of California, Irvine Nov. 2009  
*A Spectral Method with Window Technique for the Initial Value Problems of Kadomtsev-Petviashvili Equation*
- Department of Mathematics, Case Western Reserve University Nov. 2009  
*Image Segmentation Using Local and Global Intensity Fitting Active Contours/Surfaces*

- Department of Mathematics, Georgia Tech Oct. 2009  
*A Spectral Method with Window Technique for the Initial Value Problems of Kadomtsev-Petviashvili Equation*
- Department of Mathematics, University of Iowa Oct. 2009  
*A Spectral Method with Window Technique for the Initial Value Problems of Kadomtsev-Petviashvili Equation*
- Department of Mathematics, Iowa State University Oct. 2009  
*A Spectral Method with Window Technique for the Initial Value Problems of Kadomtsev-Petviashvili Equation*
- The Twelfth IEEE International Conference on Computer Vision in Kyoto Oct. 2009  
*Image Segmentation with Simultaneous Illumination and Reflectance Estimation: An Energy Minimization Approach*
- 2<sup>nd</sup> International Conference on Reaction-Diffusion Systems and Viscosity Solutions at Providence University, Taiwan July. 2009  
*Central Schemes for a new class of entropy solutions of the Buckley-Leverett equation*
- International Conference of Mathematics, National Taiwan University, Taipei, Taiwan July. 2009  
*A Spectral Method with Window Technique for the Initial Value Problems of Kadomtsev-Petviashvili Equation*
- SIAM Annual Meeting at Denver, Colorado July. 2009  
*An Efficient Algorithm for Shape Optimization on Elliptic Eigenvalue Problem*
- The Sixth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, University of Georgia Mar. 2009  
*A Spectral Method with Window Technique for the Initial Value Problems of Kadomtsev-Petviashvili Equation*
- Higher Order Geometric Evolution Equations Theory and Applications from Microfluidics to Image Understanding, IMA, UMN Mar. 2009  
*A Spectral Method with Window Technique for the Initial Value Problems of Kadomtsev-Petviashvili Equation*
- Department of Mathematics, Graz University, Austria Mar. 2009  
*Shape Optimization for Elliptic Eigenvalue Problem*
- Department of Mathematics, The Ohio State University Mar. 2009  
*Asymptotic Phases in a Cell Differential Model*
- Department of Mathematics, Tulane University Feb. 2009  
*An Efficient Algorithm for Shape Optimization on Elliptic Eigenvalue Problem*
- Department of Mathematics, South Carolina University Oct. 2008  
*Shape Optimization for Elliptic Eigenvalue Problem*
- Recent Development for Hyperbolic Equations and its Applications BIRS, Canada Sept. 2008  
*Cell Cycle Control at the First Restriction Point and its Effect on Tissue Growth*
- National Center for Theoretical Sciences, Mathematics Division, Taipei Aug. 2008  
*Cell Cycle Control at the First Restriction Point and its Effect on Tissue Growth*
- SIAM Annual Meeting: San Diego, CA Jul. 2008  
*Legendre-Transform-Based Fast Sweeping Methods for Static Hamilton-Jacobi Equations*  
*Region-Scalable Active Contour Model for Image Segmentation*
- SAMSI Workshop on Random Media Transition May. 2008  
*Shape Optimization for Elliptic Eigenvalue Problems*
- MCIAM Conference, Kellogg Center, Michigan State University Mar. 2008  
*Shape Optimization for Elliptic Eigenvalue Problems*
- SIAM Conference Analysis of Partial Differential Equations, Phoenix, Arizona Dec. 2007  
*Maximization of the Quality Factor of an Optical Resonator*
- School of Computational Science, Florida State University Oct. 2007

- Region Scalable Fitting Energy for Image Segmentation*
- Center for Imaging Science, John Hopkins Sept. 2007  
*Region Scalable Fitting Energy for Image Segmentation*
  - NCTS summer short course, Taipei, Taiwan Aug. 2007  
*Introduction to Image Segmentation*
  - 6<sup>th</sup> International Congress on Industrial and Applied Mathematics, Zurich, Switzerland July. 2007  
*Inverse Problems Involving Shapes*
  - Computational and Mathematical Aspects of Materials and Fluids: Iowa State University Apr. 2007  
*Shape Optimization for eigenvalue problems with applications in photonic crystals and vibrating systems*
  - Sweeping Seminar: Rice University Apr. 2007  
*Lax-Friedrichs Fast Sweeping Method & Sweeping Schemes for Visibility Function*
  - Seminar (Invitation to Research): The Ohio State University Feb. 2007  
*Mathematics behind Imaging Sciences*
  - Research Seminar: National Taiwan University, Taiwan Dec. 2006  
*Implicit Active Contour/Surfaces Driven by Local Binary Fitting Energy*
  - Numerical Methods for Degenerate Elliptic Equations and Applications: BIRS, Canada Dec. 2006  
*An adaptive spectral/DG method for a phase-space based level set approach to geometrical optics on curved element*
  - Seminar: University of California, Irvine Nov. 2006  
*A Geometric Method of Automatic Extraction of Sulcal Fundi*
  - Oberwolfach mini-Workshop: Anisotropic Motion Laws: Germany Aug. 2006  
*The Anisotropic Motion in human brains*
  - SIAM Annual Meeting: Boston, Massachusetts Jul. 2006  
*Fast Sweeping Methods for Static Hamilton-Jacobi Equations*
  - NCTS International Workshop on Scientific Computing: National Taiwan University, Taiwan Jun. 2006  
*A Geometric Method of Automatic Extraction of Sulcal Fundi*
  - NCTS International Workshop on Scientific Computing (Tutorial Week): National Taiwan University, Taiwan Jun. 2006  
*Inverse Problems Involving Shapes*
  - 2006 IEEE International Symposium on Biomedical Imaging: From Nano to Macro, Virginia Apr. 2006  
*A Geometric Method of Automatic Extraction of Sulcal Fundi*
  - Applied Seminars: UCLA, University of Massachusetts at Amherst, University of Colorado at Denver and Health Sciences Center, Southern Methodist University, Illinois Institute of Technology, University of Central Florida, University of Notre Dame, University of Illinois at Chicago, The Ohio State University, Georgia Tech Dec. 2005 ~ Feb. 2006  
*A Geometric Method of Automatic Extraction of Sulcal Fundi*
  - SIAM Annual Meeting: New Orleans Jul. 2005  
*Maximizing Band Gaps in Two Dimensional Photonic Crystals by Using Level Set Methods*
  - Applied Mathematics and Numerical Analysis Seminar, UMN Math Department Oct. 2004  
*Fast Sweeping Methods for Static Hamilton-Jacobi Equations*
  - SIAM Annual Meeting: Portland Jul. 2004  
*Fast Sweeping Methods for Static Hamilton-Jacobi Equations*
  - MURI On-Site Meeting at Stanford University Feb. 2004  
*Lax-Friedrich Sweeping Methods for Static Hamilton-Jacobi Equations*

- NCTS Dynamical Systems Seminar, Taiwan Dec. 2003  
*Lax-Friedrich Sweeping Methods for Static Hamilton-Jacobi Equations*
- MURI On-Site Meeting at Stanford University Jan. 2003  
*Sweeping Methods for Static Hamilton-Jacobi Equations*
- Geometrically Based Motions Reunion Conference at Lake Arrowhead Sept. 2002  
*Sweeping Methods for Static Hamilton-Jacobi Equations*
- Industrial Mathematics Modeling Workshop at NCSU Jul. 2002  
*Recognizing Sand Ripple Patterns from Side-scan Sonar Images*

**PROFESSIONAL EXPERIENCE**

- Minisymposium Organizer for SIAM Annual Conference, Minneapolis, this coming July 2012
- Minisymposium Organizer for Conference on Applied Mathematics, Modeling and Computational Science Conference, Waterloo, Ontario, Canada, July 2011
- Minisymposium Organizer for Conference on Computational and Mathematical Methods in Science and Engineering, UWM, May 2010
- Organizer for Midwest PDE conference, OSU, Nov 2008
- Minisymposium Organizer for SIAM Conference on Analysis of PDE, Phoenix, Arizona, Dec 2007
- Organizer for 2006 NCTS International Workshop on Scientific Computing: National Taiwan University, Taiwan
- Reviewer for Biomedicine and Biotechnology, Communications in Mathematical Sciences, Communications in Numerical Methods in Engineering, Discrete and Continuous Dynamical Systems B, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Image Processing, IEEE Transactions on Nuclear Science, International Journal of Biomedical Imaging, International Journal of Innovative Computation and Application, Journal of Biomedical Science and Engineering, Journal of Computer Science and Technology, Journal of Computational Mathematics, Journal of Computational Physics, Machine Vision and Applications, Physics Letters A, Pattern Recognition, SIAM Journal of Numerical Analysis.

**HONORS**

- Alfred P. Sloan Research Fellowship 2009-2011
- SIAM News: Geometry, Partial Differential Equations, and the Brain Mar/Apr 2007
- IMA Impacts; NSF Highlights: Mind-Bending Math 2006
- Medical Image Analysis second Best MICCAI Paper Award 2005
- Teaching and Research Assistantships (UCLA) Sept. 1999 ~ Jun. 2004
- Teaching and Research Assistantships (National Taiwan University) Sept. 1997 ~ Jun. 1999
- The Ministry of Education Graduate Scholarship (Taiwan) Sept. 1997 ~ Jun. 1999
- Scholarship for Gifted Senior High School Students Studying Mathematics and Natural Science (Taiwan) Sept. 1993 ~ Jun. 1997
- The Presidential Award (Taiwan) Jun. 1996

**MEMBERSHIPS**

- Society for Industrial and Applied Mathematics

**TECHNICAL SKILLS**

- Computer Languages: C++, Fortran, Matlab, Maple, Mathematica
- Platforms: Mac OS X, Windows, Unix, and Linux

## **PUBLICATIONS**

- Central Schemes for the Modified Buckley-Leverett Equation by Ying Wang and Chiu-Yen Kao (*accepted by Journal of Computational Science, 2012*)
- Changes in Ciliary Muscle Thickness During Accommodation in Children by Helen Annie Lewis, Chiu-Yen Kao, Loraine T. Sinnott, and Melissa D. Bailey (*accepted by Optometry and Vision Science, 2012*)
- Transcriptional Control in Cell Differentiation: Asymptotic Limit by Avner Friedman, Chiu-Yen Kao, Chih-Wen Shih (*accepted by Journal of Differential Equations, 2012*)
- Principal Eigenvalue Minimization for an Elliptic Problem with Indefinite Weight and Robin Boundary Conditions by Michael Hintermuller, Chiu-Yen Kao, Antoine Laurain, (*accepted by Applied Mathematics and Optimization, 2011*)
- Geometric Computation of Human Gyrfication Indexes from Magnetic Resonance Images by Shu Su, Tonya White, Marcus Schmidt, Chiu-Yen Kao, and Guillermo Sapiro, (*accepted by Human Brain Mapping, 2011*)
- Evolution of Mixed Dispersal in Periodic Environments by Chiu-Yen Kao, Wenxian Shen, and Yuan Lou, (*accepted by Discrete and Continuous Dynamical Systems B, 2011*)
- Propagation of Skin Injury after a Burn by Chuan Xue, Ching-Shan Chou, Chiu-Yen Kao, Avner Friedman, and Chandan Sen, (*accepted by Wound Repair and Regeneration, 2011*)
- Numerical Study of the KP Equation for Non-Periodic Waves by Chiu-Yen Kao and Yuji Kodama, *Mathematics and Computers in Simulation, in press, 2011*
- Multiple Scales in Streamer Discharges, with an Emphasis on Moving Boundary Approximations by U. Ebert, F. Brau, G. Derks, W. Hundsdorfer, C.-Y. Kao, C. Li, A. Luque, B. Meulenbroek, S. Nijdam, V. Ratushnaya, L. Schafer, and S. Tanveer, *Nonlinearity, 24, pages C1-C26, 2011*
- Semi-Automatic Extraction Algorithm of Ciliary Body from Visante Images by Chiu-Yen Kao, Kathryn Richdale, Loraine Sinnott and Melissa Bailey, *Optometry and Vision Science, 88(2), pages 275-289, 2011*
- Split Bregman Method for Minimization of region-Scalable Fitting Energy for Image Segmentation by Yunyun Yang, Chunming Li, Chiu-Yen Kao, Stanley Osher, *Advances in Visual Computing, volume 6454 of Lecture Notes in Computer Sciences, pages 117-128, 2010*
- Augmented Coupling Interface Method for Solving Eigenvalue Problems with Sign-changed Coefficients by Yu-Chen Shu, Chiu-Yen Kao, I-Liang Chern, and Chien C. Chang, *Journal of Computational Physics, 229, pages 9246-9268, 2010*
- A Moving Boundary Model Motivated by Electric Breakdown: II. Initial Value Problem by Chiu-Yen Kao, Fabian F. Brau, Ute Ebert, Lothar Schafer and S. Tanveer, *Physica D: Nonlinear Phenomena, 239(16), Pages 1542-1559, 2010*
- Cell Cycle Control at the First Restriction Point and its Effect on Tissue Growth by Avner Friedman, Bei Hu and Chiu-Yen Kao, *Journal of Mathematical Biology, 60(6), Pages 881-907, 2010*
- The Development of Gyrfication in Childhood and Adolescence by Tonya White, Shu Su, Marcus Schmidt, Chiu-Yen Kao, and Guillermo Sapiro, *Brain and Cognition, 72(1), Pages 36-45, 2010*
- Random Dispersal v.s. Non-local Dispersal by Chiu-Yen Kao, Yuan Lou, and Wenxian Shen, *Discrete and Continuous Dynamical Systems, 26(2), Pages 551-596, 2010*
- Modeling Oxygen Transport in Surgically Reconstructed Tissues by Anatasios Matzavinos, Chiu-Yen Kao, J. Edward F. Green, Alok Sutradhar, Michael Miller, and Avner Friedman, *Proceedings of the National Academy of Sciences, 106(29), Pages 12091-12096, 2009*

- Active Contours Driven by Local and Global Intensity Fitting Energy with Application to Brain MR Image Segmentation by Li Wang, Chunming Li, Quansen Sun, Deshen Xia, and Chiu-Yen Kao, *Journal of Computerized Medical Imaging and Graphics*, 33(7), Pages 520-531, 2009
- Asymptotic Phases in a Cell Differentiation Model by Avner Friedman, Chiu-Yen Kao, Chih-Wen Shih *Journal of Differential Equations*, 247(3), Pages 736-769, 2009
- Legendre-Transform-Based Fast Sweeping Methods for Static Hamilton-Jacobi Equations on Triangulated Meshes by Chiu Yen Kao, Stanley Osher and Jianliang Qian, *Journal of Computational Physics*, 227(24), Pages 209-225,2008
- Properties of a Level Set Algorithm for the Visibility Problems by Chiu-Yen Kao and Yen-His Tsai, *UCLA Math CAM Reports 06-04, Journal of Scientific Computing*, 35(2), Pages 170-191, 2008
- Minimization of Region-Scalable Fitting Energy for Image Segmentation by Chunming Li, Chiu-Yen Kao, John C. Gore, and Zhaohua Ding, *IEEE Transactions on Image Processing*, 17(10), Pages 1940-1949. 2008
- Principle Eigenvalue for an Elliptic Problem with Indefinite Weight on Cylindrical Domains by Chiu-Yen Kao, Yuan Lou and Eiji Yanagida, *Mathematical Biosciences and Engineering* 5(2), Pages 315-335, 2008
- Maximization of the Quality Factor of an Optical Resonator by Chiu-Yen Kao and Fadil Santosa, *Wave Motion* 45(4), Pages 412-427, 2008
- Brain MR Image Segmentation Using Local and Global Intensity Fitting Active Contours/Surfaces by Li Wang, Chunming Li, Quansen Sun, Deshen Xia, and Chiu-Yen Kao (*MICCAI*, 384-392, 2008)
- Brain MR Image Segmentation by Minimizing Scalable Neighborhood Intensity Fitting Energy: A Multiphase Level Set Approach by Chunming Li, Li Wang, Chiu-Yen Kao, John C. Gore, and Zhaohua Ding (*ISMRM 2008*)
- Incorporating Topological Derivatives into Shape Derivatives Based Level Set Method by Lin He, Chiu-Yen Kao and Stanley Osher, *UCLA Math CAM Report 06-44 (Journal of Computational Physics*, 225(1), Pages 891-909,2007)
- A Geometric Method for Automatic Extraction of Sulcal Fundi by Chiu-Yen Kao, Michael Hofer, Guillermo Sapiro, Josh Stern, and David Rottenberg, *IMA preprints 2078, (IEEE Transactions on Medical Imaging*, 26(4), Pages 530-540,2007)
- Implicit Active Contour/Surfaces Driven by Local Binary Fitting Energy by Chunming Li, Chiu-Yen Kao, and Zhaohua Ding (*IEEE CVPR*, 383014, 2007)
- A Geometric Method for Automatic Extraction of Sulcal Fundi by Chiu-Yen Kao, Michael Hofer, Guillermo Sapiro, Josh Stern, and David Rottenberg (*ISBI 2006: Pages 1168-1171*)
- Maximizing Band Gaps in Two Dimensional Photonic Crystals by Using Level Set Methods by Chiu-Yen Kao, Stanley Osher, and Eli Yablonovitch *UCLA Math CAM Reports 05-05 (Applied Physics B: Lasers and Optics*, 81, Pages 235-244,2005)
- White Matter Tractography by Anisotropic Wavefront Evolution and Diffusion Tensor Imaging by Marcel Jackowski, Chiu Yen Kao, Maolin Qiu, R. Todd Constable, and Lawrence H. Staib *UCLA Math CAM Reports 05-03 (Medical Image Analysis*, 9, Pages 427-440,2005)
- The Lax-Friedrichs Sweeping Method for Optimal Control Problems in Continuous and Hybrid Dynamics by Chiu Yen Kao, Carmeliza Navasca, and Stanley Osher, *UCLA Math CAM Reports 04-24 (Journal of Nonlinear Analysis*, 63, Pages e1561-e1572, 2005)
- Fast Sweeping Methods for Hamilton-Jacobi Equations by Chiu Yen Kao, Stanley Osher and Yen-His Tsai, *UCLA Math CAM Reports 02-66 (SIAM Numerical Analysis*, 42, Pages 2612-2632,2005)
- Estimation of Anatomical Connectivity by Anisotropic Front Propagation and Diffusion Tensor imaging by Marcel Jackowski, Chiu Yen Kao, Maolin Qiu, R. Todd Constable, and Lawrence H. Staib (*MICCAI (2) 2004: Pages 663-670*)
- Lax-Friedrichs Sweeping Scheme for Static Hamilton-Jacobi Equations by Chiu Yen Kao, Stanley Osher and Jianliang Qian, *UCLA Math CAM Report 03-38, (Journal of Computational Physics*, 196(1), Pages 367-391,2004)

**UNDER REVIEW**

- Changes in Ciliary Muscle Thickness with Accommodation by Laura Ashley E. Lossing, Loraine T. Sinnott, Chiu-Yen Kao, Kathryn Richdale, and Melissa D. Bailey (*submitted to Optometry and Vision Science, 2011*)
- The Effect of Phenylephrine on the Ciliary Muscle and Accommodation by Kathryn Richdale, Melissa D. Bailey, Loraine Sinnott, Chiu-Yen Kao, Karia Zadnik, and Mark A. Bullimore (*submitted to Optometry and Vision Science, 2011*)
- Mitochondrial Dynamics and Motility Inside Living Vascular Endothelial Cell: Role of Bioenergetics by Randy J. Giedt, Douglas R. Pfeiffer, Anastasios Matzavinos, Chiu-Yen Kao and B. Rita Alevriadou (*submitted to Annals of Biomedical Engineering, 2011*)