CURRICULUM VITAE
CHIU-YEN KAO

Department of Mathematical Sciences
Claremont McKenna College (CMC)
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EDUCATION

- Ph.D., ***Mathematics***, University of California, Los Angeles — June 2004
  Dissertation: Fast sweeping methods for static Hamilton-Jacobi equations
  Advisor: Professor 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

- ***Full Professor with Tenure*** (Mathematical Sciences, CMC) — July 2018 ~ now
- ***Associate Professor with Tenure*** (Mathematical Sciences, CMC) — Sept. 2012 ~ June 2018
- ***Visiting Associate Professor*** (Mathematical Sciences, CMC) — Sept. 2011~ Aug 2012
- ***Associate Professor with Tenure*** (Math, The Ohio State University) — Oct. 2010 ~ Aug 2012
- ***Assistant Professor*** (Math, The Ohio State University) — Sept. 2006 ~ Sept. 2010
  Perform over the full range of responsibilities: research, teaching, and service.
- ***IMA Industrial Postdoc*** (IMA, UMN) — Sept. 2004 ~ Aug. 2006
- ***Faculty Mentor for Research in Industrial Projects for Students (RIPS) Program*** (IPAM, UCLA) Jun. 2004 ~ Aug. 2004
- ***Research Assistant / Associate*** (Math, UCLA) — Apr. 2002 ~ Jun. 2004
- ***Research Assistant*** (Applied Mechanics, National Taiwan University) — Sept. 1997 ~ Jun. 1999

TEACHING EXPERIENCE

- ***Instructor, Math & Computer Science, Claremont McKenna College***

Math 55 Discrete Mathematics	Spring 2024
Math 32 Calculus III	Fall 2023
Math 111 Ordinary Differential Equations	Fall 2023
Math 32 Calculus III	Spring 2023
Math 180 Partial Differential Equations	Spring 2023
Math 60C Linear Algebra with Computing	Fall 2022
Math 111 Ordinary Differential Equations	Fall 2022
Math 111 Ordinary Differential Equations	Spring 2022
Math 165 Numerical Analysis	Spring 2022
Math 60C Linear Algebra with Computing	Fall 2020
Math 195 Advanced Topics in Mathematics on Image Processing	Fall 2020
Math 111 Ordinary Differential Equations	Spring 2020
Math 165 Numerical Analysis	Spring 2020
Math 60C Linear Algebra with Computing	Fall 2019
Math 111 Ordinary Differential Equations	Fall 2019

Math 111 Ordinary Differential Equations	Spring 2019
Math 180 Partial Differential Equations	Spring 2019
Math 32 Calculus III	fall 2018
Math 111 Ordinary Differential Equations	fall 2018
Math 461 Level Set Methods	spring 2018
Math 111 Ordinary Differential Equations	spring 2018
Math 30 Calculus I	spring 2018
Math 111 Ordinary Differential Equations	fall 2017
Math 32 Calculus III	fall 2017
Math 180 Introduction to Partial Differential Equations	spring 2017
Math 31 Calculus II	spring 2017
Math 30 Calculus I (two sessions)	fall 2016
Math 31 Calculus II	spring 2016
Math 163 Numerical Analysis	spring 2016
Math 30 Calculus I	fall 2015
Math 111 Ordinary Differential Equations	fall 2015
Math 31 Calculus II	spring 2015
Math 180 Partial Differential Equations	spring 2015
Math 31 Calculus II	spring 2013
Math 163 Applied Numerical Analysis	spring 2013
Math 31 Calculus II	fall 2012
Math 111 Ordinary Differential Equations	fall 2012
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

- ***Instructor, Math, OSU***

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
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

- NSF Grant DMS 2208373 RUI: Geometric Optimization Involving Partial Differential Equations (PI) 06/01/22-05/31/25
- NSF Grant DMS 1818948 Numerical Spectral Study of Elliptic Operators (PI) 06/01/18-05/31/22
- Collaboration Grants for Mathematicians, Simons Foundation, 09/01/2017-08/30/2018
- CMC Faculty Summer Research Funding, 2016 (PI) 06/01/2016-08/30/2016
- Howard Hughes Medical Institute, Summer Undergraduate Research Program (HHMI SURP) fellowships, Summer 2016 (co-PI) 06/01/2016-07/30/2016
- NSF Grant DMS 1346466: AWM-SIAM Workshop and Kovalevsky Lecture, 2014 (co-PI) 04/15/2014-03/31/2016
- NSF Grant DMS 1318364 (1216742): Closest point methods for eigenvalue problems from inhomogeneous structures (PI) 01/01/2013 (08/01/12)-07/31/2016
- Northrop Grumman Corporation MOU: Application of level set numerical methods to the design of optical metamaterials 10/01/2010-09/30/2012
- OSU CCTS NCTMP Y3 Method Development Award: Mathematical and computational approaches to study burn propagation and intervention (co-PI) 09/01/2010-08/30/2011
- Alfred P. Sloan Research Fellowship 09/16/2009-09/15/2011
- NIH grant NEI K23EY019097: In vivo evaluation of Presbyopia (consultant & mentor) 05/01/2009-04/30/2014
- NSF Grant DMS 0811003: Shape and topological optimization on elliptic eigenvalue problems in inhomogeneous media (PI) 07/01/2008-06/30/2011

RESEARCH PAIRS PROGRAMS

- Research in Residence at Centre Internatinal de Rencontres Mathematiques (CIRM), Luminy, France: Theoretical and Numerical Methods fro Geometrical Optimization: Chiu-Yen Kao, Seyyed Abbas Mohammadi, Braxton Osting, and Edouard Oudet, August 16-27, 2021
- Research in Pairs at National Ceter for Theoretical Sciences Mathematics Division (NCTS), Taiwan: Theoretical and Numerical Methods fro Geometrical Optimization: Chiu-Yen Kao, Seyyed Abbas Mohammadi, Braxton Osting, and Edouard Oudet, June 15-30, 2019

RESEARCH INTERESTS

- Shape Optimization for Eigenvalue Problems
- Numerical Methods for Hyperbolic Equations
- Mathematical Biology

- Level Set Methods and its Applications
- Numerical Analysis and Scientific Computing

HONORS

➢ Panelist for AWM workshop Panel: Perspectives and Advice from Women in Research, SIAM annual meeting, 2018	2018
➢ Institute of Mathematical Sciences Award, Claremont Graduate University	2017
➢ IEEE Signal Processing Society 2013 Best Paper Award	2014
➢ 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
➢ 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

SUPERVISED Ph.D. STUDENTS

- Nathan Schroeder, current Ph.D. student, Claremont Graduate University.
- Vladimir Delengov, Ph.D., 2018, Claremont Graduate University.
  Thesis: Computing Eigenmodes of Elliptic Operators on Manifolds Using Radial Basis Functions.
  Current Position: Product owner, EvoShare.
- Weaam Alhejaili, Ph.D., 2018, Claremont Graduate University.
  Thesis: *A Numerical Study of Steklov Eigenvalue Problems*
  Current Position: Department of Mathematical Sciences, College of Sciences, Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia
- Patrick Choi, Ph.D., 2016, Claremont Graduate University.
  Thesis: *Optimization of the Principal Eigenvalue of an Elliptic Operator with Application to Heat Conductor*
  Current Position: Software Engineer, Raytheon.
- Ying Wang, Ph.D., 2010, The Ohio State University.
  Thesis: *Central Schemes for the modified Buckley-Leverett equation*
  Current Position: Associate Professor, Department of Mathematics, University of Oklahoma.
- 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, American Electric Power

SUPERVISED UNDERGRADUATE THESIS STUDENTS

- Shu Bin, B.S., 2020, Claremont McKenna College.
  Thesis: *K-Means Stock Clustering Analysis Based on Historical Price Movements and Financial Ratios.*
- Yizhou Tao, B.S., 2018, Claremont McKenna College.
  Thesis: *Decoding Book Barcode Images.*

- Sam Malagon, B.S., 2015, Claremont McKenna College.
  Thesis: *Chladni Figures through Vibrating Plates.*

SECOND READER FOR SENIOR THESIS

- Ethan Kurz, B.S., 2020, Claremont McKenna College.
  Thesis: *Optimal Execution in Cryptocurrency Markets.*
- Rhiann Holman, B.S., 2020, Claremont McKenna College.
  Thesis: *Stochastic Simulation of Traffic Flow and Valuation of Travel Time Saved.*
- Wenhao Zhang, B.S., 2018, Claremont McKenna College.
  Thesis: *The Boundedness of the Hardy-Littlewood Maximal Function and the Strong Maximal Function on the Space BMO.*

PRESENTATIONS

- 14th Annual WIMSOCAL 2024, Pomona College, Claremont Feb. 24 2024
  Harmonic Functions on Finitely Connected Tori
- Gateway to Exploring Mathematical Sciences (GEMS), Harvey Mudd College, Claremont Oct.7 2023
  Magic 0 and 1
- MAA MATHFEST, Tampa, Florida August 20-5, 2023
  Maximal Total Population of Species in a Diffusive Logistic Model
- Society for Mathematical Biology (SMB) Annual Meeting July 16-21, 2023
  Our Math and Biology Journey: A tribute to Ching-Shan Chou
- Summer Research Program, Claremont McKenna College June 14, 2023
  Mathematical Approaches to Shape Optimization
- Level Set Seminar, UCLA June 12, 2023
  Recent Numerical Developments on the Extremal Steklov Eigenvalue Problems
- Modelling, Computational, and Applied Mathematics (MOCAM) seminar series, University of the Witwatersrand, Johannesburg, South Africa May 31, 2023
  Geometric Optimization Involving Partial Differential Equations
- SIAM Central States Section Computational and Applied Mathematics Forum, The University of Oklahoma May 17, 2023
  Geometric Optimization Involving Partial Differential Equations
- Applied and Computational Mathematics Seminar, University of California, Irvine April 10, 2023
  Computational Approaches to Construct Free Boundary Minimal Surface via Extremal Steklov Eigenvalue Problems
- The International Conference on New Trends in Computational and Data Sciences, Caltech December 20, 2022
  Computational Approaches for Extremal Geometric Eigenvalue Problems
- Marian Miner Cook Athenaeum, Claremont McKenna College November 7, 2022
  Viewing our World through Mathematics
- Pacific Institute for the Mathematical Sciences-University of British Columbia Math Job Forum October 24, 2022
  Landing a faculty job in a liberal art college
- Applied Math Seminar, University of Utah October 17, 2022
  Maximal Total Population of Species in a Diffusive Logistic Model
- Applied Math Seminar, Claremont Center for the Mathematical Sciences September 19, 2022
  Computational Approaches to Optimization Problems in Inhomogeneous Rods and Plates
- International Workshop on Applications of Geometric Methods of Functional Analysis, UT Dallas, May 5, 2022
  A Rearrangement Minimization Problem Corresponding to p-Laplacian Equation
- New Trends in Scientific Computing, IPAM, UCLA April 20, 2022

Level Set Methods and Their Applications in Physics, Biology, Image Sciences, and Beyond

- DMS Applied Mathematics Seminar, Auburn University Nov 12, 2021
  Computational Approaches to Steklov Eigenvalue Problems and Free Boundary Minimal Surfaces
- Numerical Relativity Workgroup, IPAM, UCLA Nov 2,4,8, 2021
  Introduction to Numerical Methods for Hyperbolic Equations (I) Linear, (II) Nonlinear, and (III) ENO
- Theoretical Biology Seminar, Mathematics Department, The Pennsylvania State University Oct 13, 2021
  Optimization Problems in Reaction Diffusion Models for Population Dynamics
- The 11th Seminar on Geometry and Topology, Yasouj University, Iran July 20-22, 2021
  Computation of Free Boundary Minimal Surfaces via Extremal Steklov Eigenvalue Problems
- Analysis/Applied Mathematics Seminar, University of Wisconsin-Milwaukee April 2, 2021
  Optimization Problems in Reaction Diffusion Models for Population Dynamics
- Cold Place Math Biology Seminar, University of Minnesota March 15, 2021
  Optimization Problems in Reaction Diffusion Models for Population Dynamics
- Claremont & Utah Joint Applied Math Seminar, Claremont Colleges Jan 25, 2021
  Minimization of the First Nonzero Eigenvalue Problem for Two-Phase Conductors with Neumann Boundary Conditions
- 2020 Canadian Mathematical Society (CMS) Winter Meeting Dec 3-8, 2020
  Computation of Free Boundary Minimal Surfaces via Extremal Steklov Eigenvalue Problems
- Fall 2020 Hackathon Workshop Nov, 6, 2020
  Mini-course on Image Processing and its Applications
- SIAM Conference on Analysis of Partial Differential Equations, La Quinta, California Dec, 13, 2019
  A Conformal Mapping Approach to Steklov Eigenvalue Problems
- 9th International Congress on Industrial and Applied Mathematics, Valencia, Spain July 15-19, 2019
  Clamping Interior Points of Vibrating Rods and Plates
- Theoretical and Numerical Methods for Shape Optimization June 21, 2019
  Interfacial Dynamics and Shape Optimizations
- Claremont Colleges Mathematics Colloquia Apr 24, 2019
  A Conformal Mapping Approach to Shape Optimizations
- 2019 AWM Research Symposium Apr 11, 2019
  Maximal Convex Combinations of Sequential Steklov Eigenvalues
- 2019 Claremont Math Weekend Jan 26, 2019
  Frequency control of Rods and Plates
- NCTS One-day Workshop on Applied Mathematics – Interplay of Data Science and Numerical PDEs, Taipei, Taiwan Dec. 25, 2018
  Extremal Rearrangement Problems Involving Poisson's Equation with Robin Boundary Condition
- 2018 Workshop on Nonlinear Analysis, Harvey Mudd College, Claremont Dec. 1, 2018
  Extremal Rearrangement Problems Involving Poisson's Equation with Robin Boundary Condition
- Applied Math Seminar, California State University, Northridge Oct 3, 2018
  Maximal Convex Combinations of Sequential Steklov Eigenvalues
- Johns Hopkins Center for Talented Youth Family Academic Programs, Science and Technology Series, Claremont McKenna College, California Oct. 13, 2018
  Finding Your Optimal Paths?
- 2018 SIAM Annual Meeting, Oregon Convention Center, Portland
  Extremal Spectral Gaps for Periodic Schrödinger Operators July 10, 2018

- The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, National Taiwan University, Taiwan, 2018
  Extremal Spectral Gaps for Periodic Schrödinger Operators July 8, 2018
  A Numerical Study of Steklov Eigenvalue Problem via Conformal Mapping July 6, 2018
- Plenary Speakers, Southern California Applied Mathematics Symposium (SOCAMS), 2018
  Extremal Spectral Gaps for Periodic Schrödinger Operators Apr 28, 2018
- AMS Sectional Meeting at Portland State University, Portland, OR
  Study of a Mixed Dispersal Population Dynamics Model Apr 14-15, 2018
- 26th Annual Meeting on Differential Equations and Related Topics, National Taiwan University
  Extremal Spectral Gaps for Periodic Schrödinger Operators Jan 6, 2018
- Mathematics Colloquium, Department of Mathematics and Statistics, California State University, Long Beach Dec 1, 2017
  Minimization of Inhomogeneous Biharmonic Eigenvalue Problems
- AMS Sectional Meeting, University of California, Riverside Nov 4, 2017
  Optimal Spatial Arrangements of Favorable and Unfavorable Regions
- Applied Math Seminar, Department of Mathematics, University of Utah Oct 16, 2017
  Minimizing Eigenvalues for Inhomogeneous Rods and Plates
- Second USA-Uzbekistan Conference Aug. 8-12, 2017
  Minimizing Eigenvalues for Inhomogeneous Rods and Plates
- 70 Years of Mathematics at NTU: International Workshop on Applied Mathematics June 24-25, 2017
  Extremal Eigenvalues of Laplace (-Beltrami) Operators
- Numerical Methods for PDEs on Surfaces Workshop, Pacific Institute for the Mathematical Sciences, Vancouver, Canada June 11-15, 2017
  Optimization of Laplace-Beltrami Eigenvalues on Riemannian Surfaces
- Johns Hopkins Center for Talented Youth Family Academic Programs, Science and Technology Series, Claremont McKenna College, California Mar. 4, 2017
  Path Planning in Real World Examples and Beyond
- 2017 Claremont Math Weekend Jan 28, 2017
  Recent Numerical Approaches for Solving PDEs on Surfaces
- 2016 SIAM Annual Meeting, The Westin Boston Waterfront, Boston, Massachusetts July 11-15, 2016
  Computational Methods for Extremal Steklov Problems
- The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida, July 1-5, 2016
  Computational Methods for Extremal Steklov Problems
- Applied Math Seminar, Department of Mathematics, University of California, Riverside May 25, 2016
  Computational Methods for Extremal Steklov Problems
- Colloquium, Department of Mathematical Sciences, University of Wisconsin-Milwaukee May 6, 2016
  Computational Methods for Extremal Steklov Problems
- Claremont Mathematics Weekend, Claremont Jan. 30, 2016
  Computational Methods for Extremal Steklov Problems
- Department of Mathematics, National Chung Hsing University, Taichung, Taiwan Dec. 31, 2015
  Shape Optimization for Eigenvalue Problems Involving Biharmonic Operators
- Department of Mathematics, National Cheng Kung University, Tainan, Taiwan Dec. 30, 2015
  Shape Optimization for Eigenvalue Problems Involving Biharmonic Operators
- NCTS/NTU/NCU/NTUST Joint Seminar on Applied Mathematics, Taipei, Taiwan Dec. 25, 2015

Shape Optimization for Eigenvalue Problems Involving Biharmonic Operators

- IEEE NANOMED, Waikiki, Hawaii Nov. 17 2015
  Mathematical Modeling for Biological Processes Involving Tissue Growth and Granulomas
- Johns Hopkins Center for Talented Youth Family Academic Programs, Science and Technology Series, Claremont McKenna College, California Oct. 24 2015
  Path Planning in Real World Examples and Beyond
- Marian Miner Cook Athenaeum, Claremont McKenna College, California Oct. 7 2015
  Level Set Methods and Dynamic Implicit Surfaces
- 8th International Congress on Industrial and Applied Mathematics, Beijing, China Aug. 2015
  Shape Optimization for Eigenvalue Problems Involving Biharmonic Operators
  Eigenvalues Minimization for Biharmonic Equations
- Gateway to Exploring Mathematical Sciences (GEMS) 2014-2015, Claremont Apr.11 2015
  The Mathematics of Musical Instruments
- Laplacian and Heat Kernels: Theory and Applications, BIRS, Canada Mar.23 2015
  Shape Optimization for Eigenvalue Problem Involving Biharmonic Operators
- W.M. Keck Science Department Feb.20 2015
  Introduction to Image Segmentation and Its Applications to Biomedical Images
- 2014 NCTS Christmas Workshop on Fast Solvers on Scientific Computing, Taiwan Dec.25 2014
  Fast Solvers for Time-Independent Fully Nonlinear First Order PDEs
- Department of Mathematics, National Central University, Taiwan Dec. 24 2014
  Maximal Laplace-Beltrami Eigenvalues on Closed Riemannian Surfaces
- Department of Mathematics, National Tsing Hua University, Taiwan Dec. 22 2014
  On the Dynamics of Radially Symmetric Granuloma
- Department of Mathematics, University of Alabama at Birmingham Oct. 3 2014
  Shape Optimization Problems Involving Eigenvalues and Their Applications
- Department of Mathematics, University of Alabama Oct. 2 2014
  Shape Optimization Problems Involving Eigenvalues and Their Applications
- Department of Aerospace and Mechanical Engineering, University of Arizona Sept. 11 2014
  Shape Optimization Problems Involving Eigenvalues and Their Applications
- SIAM Annual Meeting, The Palmer House, Chicago Jul. 7-11 2014
  Maximal Laplace-Beltrami Eigenvalues on Closed Riemannian Surfaces
- International Conference on Spectral and Higher Order Methods, Salt Lake City Jun. 27 2014
  Maximal Laplace-Beltrami Eigenvalues on Closed Riemannian Surfaces
- USA-Uzbekistan Conference, California State University, Fullerton May. 20 2014
  Optimal Eigenvalues of Laplace and Laplace-Beltrami Operators
- Department of Mathematics, Loyola Marymount University Nov. 6 2013
  Shape Optimization Problem Involving Eigenvalues and Their Applications
- SIAM Annual Meeting, Town and Country Resort & Convention Center, San Diego Jul. 8-12 2013
  Minimal Convex Combinations of Sequential Laplace-Dirichlet Eigenvalues
- 2013 Special Central AMS Meeting, Iowa State University, Ames, IA Apr. 27-28, 2013
  Geometric Optimization of Dirichlet-Laplacian Eigenvalues
- Mathematics Colloquium, Department of Mathematics, University of Houston Mar. 20, 2013
  Minimal Convex Combinations of Three Sequential Laplace-Dirichlet Eigenvalues
- AWM Research Symposium, Santa Clara University Mar. 16-17 2013

Lax-Friedrichs Fast Sweeping Methods

- Mathematical Challenges in Biomolecular/Biomedical Imaging and Visualization, Mathematical Biosciences Institute, OSU Feb. 2013

  Semiautomatic Extraction Algorithm for Images of the Ciliary Muscle
- Level Set Seminar, Department of Mathematics, UCLA Jan. 2013

  Minimal Convex Combinations of Three Sequential Laplace-Dirichlet Eigenvalues
- National Center for Theoretical Sciences, National Tsing Hua University, Taiwan Dec. 2012

  Minimal Convex Combinations of Three Sequential Laplace-Dirichlet Eigenvalues
- One-Day Workshop on Partial Differential Equations, Analysis, Numerics and Applications, Center of Mathematical Modeling and Scientific Computing, National Chiao Tung University, Taiwan Dec. 2012

  Minimal Convex Combinations of Three Sequential Laplace-Dirichlet Eigenvalues
- CAM-ICCM Imaging Science: a workshop in honor of Stanley Osher, Mathematical Science Center of Tsinghua University, Beijing, China Dec. 2012

  Minimal Convex Combinations of Sequential Laplace-Dirichlet Eigenvalues
- International Conference on Imaging Science 2012 (in honor of Professor Stanley Osher at his 70th birthday), Hong Kong Dec. 2012

  Level Set Methods and their Applications to Biomedical Image Processing
- AMS sectional meeting in Tucson, Arizona Oct. 2012

  Shape Optimization involving Eigenvalues of Laplace-Beltrami Operator
- Applied Math Seminar, Department of Mathematics, UC Davis Oct. 2012

  Shape Optimization involving Eigenvalues of Laplace-Beltrami Operator
- SIAM Annual Meeting at Minneapolis, Minnesota Jul. 2012

  Principal Eigenvalue Minimization for an Elliptic Problem with Indefinite Weight
- Department of Mathematics, University of California, Riverside Apr. 2012

  An Efficient Rearrangement Algorithm for Shape Optimization Problem Involving Principal Eigenvalue in Population Dynamics
- Department of Mathematics and Statistics, California State University, Long Beach Apr. 2012

  Shape Optimization Problem Involving Principal Eigenvalue in Population Dynamics
- Advances in Scientific Computing, Imaging Science and Optimization: Stan Osher's 70th Birthday Conference Apr. 2012

  Lax-Friedrichs Fast Sweeping Methods
- AMS 2012 Spring Western Section Meeting, Hawaii Mar. 2012

  Fast Sweeping Methods for Steady State Problems of Hyperbolic Conservation Laws with Source Terms
- Claremont Colleges Colloquium Feb. 2012

  An Efficient Rearrangement Algorithm for Shape Optimization Problem Involving Principal Eigenvalue in Population Dynamics
- 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
- 7th 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
- 2nd 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, Johns Hopkins Sept. 2007
  Region Scalable Fitting Energy for Image Segmentation
- NCTS summer short course, Taipei, Taiwan Aug. 2007
  Introduction to Image Segmentation
- 6th 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 ICIAM (International Congress of Industrial and Applied Mathematics) Conference, Japan, August 2023
- Conference Organizer for International Conference on New Trends in Scientific Computing, IPAM, UCLA, April 20-22, 2022
- Conference Organizer for Hybrid Annual Conference of the Society of Mathematical Biology (SMB), June 13-17, 2021
- Conference Organizer for SMB Workshop on Education and Research Experiences for Undergraduates, April 1-2, 2021

- Minisymposium Organizer for SIAM Conference on Analysis of Partial Differential Equations, La Quinta, California, December 11-14, 2019
- Minisymposium Organizer for the 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, National Taiwan University, Taiwan, July, 2018
- WINASC Minisymposium Organizer for AWM Research Symposium 2017 at UCLA, April 2017
- Minisymposium Organizer for ICIAM (International Congress of Industrial and Applied Mathematics) Conference, Beijing, August 2015
- Organizer for WhAM! A Research Collaboration Workshop for Women in Applied Mathematics at IMA, Aug. 12-15, 2014
- AWM Minisymposium Organizer for SIAM Annual Conference, Chicago, July 2014
- Minisymposium Organizer for SIAM Annual Conference, San Diego, July 2013
- Minisymposium Organizer for SIAM Annual Conference, Minneapolis, 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
- Editorial board member of Discrete Continuous Dynamical Systems – Series B and RMS: Research in Mathematics & Statistics
- Reviewer for Advances in Numerical Analysis, Biomedicine and Biotechnology, Communications in Mathematical Sciences, Communications in Numerical Methods in Engineering, Computers & Mathematics with Applications, Digital Signal Processing, 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 for Numerical Methods in Biomedical Engineering, International Journal of Biomedical Imaging, International Journal of Innovative Computation and Application, Inverse Problems and Imaging, Journal of Biomedical Science and Engineering, Journal of Computational and Applied Mathematics, Journal of Computational Mathematics, Journal of Computer Science and Technology, Journal of Computational Mathematics, Journal of Computational Physics, Journal of Mathematical Imaging and Vision, Journal of Scientific Computing, Machine Vision and Applications, Mathematical Biosciences and Engineering, Neuroimaging, NSF Panel, Physics Letters A, Pattern Recognition, Research in the Mathematical Sciences, SIAM Journal of Applied Mathematics, SIAM Journal of Numerical Analysis, and Studies in Applied Mathematics.

MEMBERSHIPS

- American Mathematical Society
- AWM Association for Women in Mathematics
- Society for Industrial and Applied Mathematics

PUBLICATIONS

- Harmonic Functions on Finitely Connected Tori by Chiu-Yen Kao, Braxton Osting, and Edouard Oudet , *SIAM Journal on Numerical Analysis*, Vo. 61, No.6, 2795-2812, 2023
- Impact of Accommodative Insufficiency and Accommodative/Vergence Therapy on Ciliary Muscle Thickness in the Eye by Emmanuel Owusu, Nahrain M Shasteen, G. Lynn Mitchell, Melissa D Bailey, Chiu-Yen Kao, Andrew J Toole, Kathryn Richdale, and Marjean T Kulp*, Ophthalmic and Physiological Optics*, *2023*

- Flat Tori with Large Laplacian Eigenvalues in Dimensions up to Eight by Chiu-Yen Kao, Braxton Osting, and Jackson C Turner, *SIAM Journal on Applied Algebra and Geometry*, Vol. 7, No.1, 172-193, 2023.
- Review of Computational Approaches to Optimization Problems in Inhomogeneous Rods and Plates by Chiu-Yen Kao and Weitao Chen, *Communications on Applied Mathematics and Computation, 1-21*, 2023.
- Maximal Total Population of Species in a Diffusive Logistic Model by Chiu-Yen Kao and Seyyed Abbas Mohammadi, *Journal of Mathematical Biology*, 85(5), 1-27, 2022.
- Ciliary Muscle Thickness in Adults with Down Syndrome by Heather A Anderson, Melissa D. Bailey, Ruth E. Manny, and Chiu-Yen Kao, *Ophthalmic and Physiological Optics*, 1-7, 2022
- A Rearrangement Minimization Problem Corresponding to p-Laplacian Equation by Chiu-Yen Kao and Seyyed Abbas Mohammadi, ESAIM: Control, Optimisation and Calculus of Variations, 28, 11, 2022
- In Vivo Activity of Repurposed Amodiaquine as a Host-Targeting Therapy for the Treatment of Anthrax by Mikhail Martchenko Shilman et. al., *ACS Infectious Diseases, 7.8, 2176-2191, 2021.*
- Optimal Chemotherapy for Brain Tumor Growth in a Reaction-Diffusion Model by Mohsen Yousefnezhad, Chiu-Yen Kao and Seyyed Abbas Mohammadi, *SIAM Journal on Applied Mathematics, 81, 1077-1097, 2021.*
- Computation of Free Boundary Minimal Surfaces Via Extremal Steklov Eigenvalue Problems by Edouard Oudet, Chiu-Yen Kao, and Braxton Osting, *ESAIM: Control, Optimisation and Calculus of Variations, 27, 2021.*
- Tuning the Total Displacement of Membranes by Chiu-Yen Kao and Seyyed Abbas Mohammadi, *Communications in Nonlinear Science and Numerical Simulation, 96, 105706, 2021.*
- Extremal Rearrangement Problems Involving Poisson's Equation with Robin Boundary Conditions by Chiu-Yen Kao and Seyyed Abbas Mohammadi, *Journal of Scientific Computing 86(3), 1-28, 2021.*
- Linear Convergence of a Rearrangement Method for the One-Dimensional Poisson Equation by Chiu-Yen Kao, Seyyed Abbas Mohammadi, and Braxton Osting, *Journal of Scientific Computing 86(1), 1-18, 2021.*
- Accommodative Exercises to Lower Intraocular Pressure by Thomas J. Stokkermans, Jeremy C. Reitinger, George Tye, Chiu-Yen Kao, Sangeetha Ragupathy, Huachun A. Wang, and Carol B. Toris, *Journal of Ophthalmology, 2020, 1-7, 2020*
- Minimization of the First Nonzero Eigenvalue Problem for Two-Phase Conductors with Neumann Boundary Conditions by Di Kang, Patrick Choi, Chiu-Yen Kao, *SIAM Journal on Applied Mathematics, 80 (4), 1607-1628, 2020*
- Maximal Convex Combinations of Sequential Steklov Eigenvalues by Weaam Alhejaili and Chiu-Yen Kao, *Journal of Scientific Computing, 79(3), 2006-2026, 2019*
- Numerical Studies of the Steklov Eigenvalue Problem via Conformal Mappings by Weaam Alhejaili and Chiu-Yen Kao, *Applied Mathematics and Computation, 347, 785-802, 2019*
- Extremal Spectral Gaps for Periodic Schrödinger Operators by Chiu-Yen Kao and Braxton Osting, *ESAIM: Control, Optimisation and Calculation of Variations, 25, 1-35, 2019*
- Minimization of Inhomogeneous Biharmonic Eigenvalue Problems by Di Kang and Chiu-Yen Kao, *Applied Mathematical Modelling, 51, 587-604, 2017*
- Maximization of Laplace-Beltrami Eigenvalues on Closed Riemannian Surfaces by Chiu-Yen Kao, Rongjie Lai, and Braxton Osting, *ESAIM: Control, Optimisation and Calculation of Variations, 23(2), 685-720, 2017*
- Computational Methods for Extremal Steklov Problems by Eldar Akhmetgaliyev, Chiu-Yen Kao, and Braxton Osting, *SIAM Journal on Control and Optimization, 55(2), 1226-1240, 2017*
- Minimizing Eigenvalues for Inhomogeneous Rods and Plates by Weitao Chen, Ching-Shan Chou and Chiu-Yen Kao, *Journal of Scientific Computing, 69, 983-1013, 2016*
- Absolute Stability and Synchronization in Neural Field Models with Transmission Delays by Chiu-Yen Kao, Chih-Wen Shih and Chang-Hong Wu, *Physica D: Nonlinear Phenomena, 328, 21-33, 2016*
- A new Algorithm to Simulate First Exit Times for Vector of Arithmetic Brownian Motions with an Application to Finance by Chiu-Yen Kao, Qidi Peng, Henry Schellhorn, and Lu Zhu, *Journal of Applied Probability and Statistics, 10(2), 41-65, 2015*
- Lax-Friedrichs Multigrid Fast Sweeping Methods for Steady State Problems for Hyperbolic Conservation Laws by Weitao Chen, Ching-Shan Chou, and Chiu-Yen Kao, *Journal of Scientific Computing, 64(3), 591-618, 2015*

- A Fast Explicit Operator Splitting Method for Modified Buckley-Leverett Equations by Chiu-Yen Kao, Alexander Kurganov, Zhuolin Qu, and Ying Wang, 64(3), 837-857, *Journal of Scientific computing, 2015*
- On the Benilov-Vynnycky Blow-Up Problem by Marina Chugunova, Chiu-Yen Kao, and Sarun Seepun *Discrete & Continuous Dynamical Systems-Series B 20 (5), 1443-1460, 2015*
- Bounded Domain Problem for the Modified Buckley-Leverett Equation by Ying Wang and Chiu-Yen Kao, *Journal of Dynamics and Differential Equations, 26(3), 607-629, 2014*
- On the Dynamics of Radially Symmetric Granulomas by Avner Friedman, Chiu-Yen Kao, and Rachel Leander, *Journal of Mathematical Analysis and Applications, 412(2), 776-791, 2014*
- Gyrification differences in Children and Adolescents with Velocardiofacial Syndrome and Attention-Deficit/Hyperactivity Disorder: A Pilot Study by Sabine E. Mous, Canan Karatekin, Chiu-Yen Kao, Irving Gottesman, Danielle Posthuma, Tonya J.H. White, *221(2), 169-171, Psychiatry Research Neuroimaging, 2014*
- An Adaptive Spectral/DG Method for a Reduced-Phase Space Based Level Set Approach to Geometrical Optics on Curved Elements by Bernardo Cockburn, Chiu-Yen Kao, and Fernando Reitich, *Journal of Computational Physics, 259, 636-649, 2014*
- Minimal Convex Combinations of Three Sequential Laplace-Dirichlet Eigenvalues by Braxton Osting and Chiu-Yen Kao, *Applied Mathematics and Optimization, 69(1), 123-139, 2014*
- Convergent Finite Difference Methods for One-Dimensional Fully Nonlinear Second Order Partial Differential Equations by Xiaobing Feng, Chiu-Yen Kao, and Thomas Lewis, *Journal of Computational and Applied Mathematics, 254, 81-98, 2013*
- Ciliary Muscle Thickness in Anisometropia by Mallory K. Kuchem, Loraine Sinnott, Chiu-Yen Kao, and Melissa D. Bailey, *Optometry and Vision Science, 90(11), 1312-1320, 2013*
- Region-Specific Relationships Between Refractive Error and Ciliary Muscle Thickness in Children by Andrew D. Pucker, Loraine T. Sinnott, Chiu-Yen Kao, Melissa D. Bailey, *Journal of Investigative Ophthalmology & Visual Science, 54(7), 4710-4716, 2013*
- Geometric Computation of Human Gyrification Indexes from Magnetic Resonance Images by Shu Su, Tonya White, Marcus Schmidt, Chiu-Yen Kao, and Guillermo Sapiro, *Human Brain Mapping, 34(5), 1230-1244, 2013*
- Quantification of Age-Related and per Diopter Accommodative Changes of the Lens and Ciliary Muscle in the Emmetropic Human Eye by Kathryn Richdale, Loraine T. Sinnott, Mark A. Bullimore, Peter Wassenaar, Petra Schmalbrock, Chiu-Yen Kao, Samuel Patz, Donald Mutti, Adrian Glasser, Karla Zadnik *Investigative Ophthalmology & Visual Science, 54(2), 1095-1105, 2013*
- Lax-Friedrichs Fast Sweeping Methods for Steady State Problems for Hyperbolic Conservation Laws by Weitao Chen, Ching-Shan Chou, and Chiu-Yen Kao, *Journal of Computational Physics, 234, 452-471, 2013*
- Efficient Rearrangement Algorithms for Shape Optimization on Elliptic Eigenvalue Problems by Chiu-Yen Kao and Shu Su, *Journal of Scientific Computing, 54, 492-512, 2013*
- Central Schemes for the Modified Buckley-Leverett Equation by Ying Wang and Chiu-Yen Kao, *Journal of Computational Science, 4, 12-23, 2013*
- Minimal Convex Combinations of Sequential Laplace-Dirichlet Eigenvalues by Braxton Osting and Chiu-Yen Kao, *SIAM Journal of Scientific Computing, 35(3), B731-B750, 2013*
- The Effect of Phenylephrine on the Ciliary Muscle and Accomodation by Kathryn Richdale, Melissa D Bailey, Loraine T. Sinnott, Chiu-Yen Kao, Karla Zadnik, Mark A. Bullimore, *Optometry and Vision Science, 89(10), 1507-1511, 2012*
- 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, *Annals of Biomedical Engineering, 40 (9), 1903-1916, 2012*
- Evolution of Mixed Dispersal in Periodic Environments by Chiu-Yen Kao, Wenxian Shen, and Yuan Lou, *Discrete and Continuous Dynamical Systems B, 17, 2047-2072, 2012*
- Asymptotic limit in a cell differentiation model with consideration of transcription by Avner Friedman, Chiu-Yen Kao, Chih-Wen Shih, *Journal of Differential Equations, 252, 5679-5711, 2012*
- Changes in Ciliary Muscle Thickness During Accommodation in Children by Helen Annie Lewis, Chiu-Yen Kao, Loraine T. Sinnott, and Melissa D. Bailey, *Optometry and Vision Science, 89(5), 727-737, 2012*

- Measuring Changes in Ciliary Muscle Thickness with Accommodation in Young Adults by Laura Ashley E. Lossing, Loraine T. Sinnott, Chiu-Yen Kao, Kathryn Richdale, and Melissa D. Bailey, *Optometry and Vision Science, 89(5), 719-726, 2012*
- Paradoxical Relationships Between Refractive Error and Ciliary Muscle Thickness in Children, by Andrew D Pucker, Loraine T Sinnott, Chiu-Yen Kao, Melissa Bailey, *Investigative Ophthalmology & Visual Science, 53(14), page 149, 2012*
- Numerical Study of the KP Equation for Non-Periodic Waves by Chiu-Yen Kao and Yuji Kodama, *Mathematics and Computers in Simulation, 82, 1185-1218, 2012*
- Principal Eigenvalue Minimization for an Elliptic Problem with Indefinite Weight and Robin Boundary Conditions by Michael Hintermüller, Chiu-Yen Kao, Antoine Laurain, *Applied Mathematics and Optimization, 65, 111-146, 2012*
- Propagation of Cutaneous Thermal Injury: A Mathematical Model by Chuan Xue, Ching-Shan Chou, Chiu-Yen Kao, Avner Friedman, and Chandan Sen, *Wound Repair and Regeneration, 20(1), 114-122, 2012*
- Semi-Automatic Extraction Algorithm for Images of the Ciliary Muscle by Chiu-Yen Kao, Kathryn Richdale, Loraine Sinnott, Lauren Ernst, and Melissa Bailey, *Optometry and Vision Science, 88(2), 275-289, 2011*
- Multiple Scales in Streamer Discharges, with an Emphasis on Moving Boundary Approximations by Ute Ebert, Fabian Brau, Gianne Derks, Willem Hundsdorfer, Chiu-Yen Kao, Chao Li, Alejandro Luque, Bernard Meulenbroek, Sander Nijdam, Valeria Ratushnaya, Lothar Schäfer, and Saleh Tanveer, *Nonlinearity, 24, C1-C26, 2011*
- 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, 9246-9268, 2010*
- A Moving Boundary Model Motivated by Electric Breakdown: II. Initial Value Problem by Chiu-Yen Kao, Fabian F. Brau, Ute Ebert, Lother Schafer and S. Tanveer, *Physica D: Nonlinear Phenomena, 239(16), 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), 881-907, 2010*
- Random Dispersal v.s. Non-local Dispersal by Chiu-Yen Kao, Yuan Lou, and Wenxian Shen, *Discrete and Continuous Dynamical Systems, 26(2), 551-596, 2010*
- The Development of Gyrification in Childhood and Adolescence by Tonya White, Shu Su, Marcus Schmidt, Chiu-Yen Kao, and Guillermo Sapiro, *Brain and Cognition, 72(1), 36-45, 2010*
- 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), 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), 736-769, 2009*
- 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), 12091-12096, 2009*
- Legendre-Transfrom-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), 209-225,2008*
- 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), 1940-1949. 2008*
- Properties of a Level Set Algorithm for the Visibility Problems by Chiu-Yen Kao and Yen-His Tsai, *Journal of Scientific Computing, 35(2), 170-191, 2008*
- Maximization of the Quality Factor of an Optical Resonator by Chiu-Yen Kao and Fadil Santosa*, Wave Motion 45(4), 412-427, 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), 315-335, 2008*

- Incorporating Topological Derivatives into Shape Derivatives Based Level Set Method by Lin He, Chiu-Yen Kao and Stanley Osher, *Journal of Computational Physics, 225(1), 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, *IEEE Transactions on Medical Imaging, 26(4), 530-540,2007*
- The Lax-Friedrichs Sweeping Method for Optimal Control Problems in Continuous and Hybrid Dynamics by Chiu Yen Kao, Carmeliza Navasca, and Stanley Osher*, Journal of Nonlinear Analysis, 63, e1561-e1572, 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, *Medical Image Analysis, 9, 427-440,2005*
- Maximizing Band Gaps in Two Dimensional Photonic Crystals by Using Level Set Methods by Chiu-Yen Kao, Stanley Osher, and Eli Yablonovitch, *Applied Physics B: Lasers and Optics, 81, 235-244,2005*
- Fast Sweeping Methods for Static Hamilton-Jacobi Equations by Chiu Yen Kao, Stanley Osher and Yen-His Tsai, *SIAM Numerical Analysis, 42, 2612-2632,2005*
- Lax-Friedrichs Sweeping Scheme for Static Hamilton-Jacobi Equations by Chiu Yen Kao, Stanley Osher and Jianliang Qian*, Journal of Computational Physics, 196(1), 367-391,2004*

CONFERENCE PROCEEDINGS

- Ciliary Muscle Thickness in Adults with Down Syndrome by Heather A Anderson, Melissa D. Bailey, and Chiu-Yen Kao, *Investigative Ophthalmology & Visual Science, 60(9), 4306, 2019*
- Effect of Accommodative Therapy on Ciliary Muscle Thickness by Marjean T. Kulp, Nahrain Shasteen, G Lynn Mitchell, Melissa Bailey, Chiu-Yen Kao, *Investigative Ophthalmology & Visual Science, 58(8), 2710, 2017*
- Two patterns of Ciliary Muscle Growth in Myopia by Melissa Bailey, Chiu-Yen Kao, Nidhi Satiani, Loraine T Sinnott, *Investigative Ophthalmology & Visual Science, 55(13), 3643, 2014*
- Uncovering the Effects of Age and Accommodation on the Human Eye through Imaging, by Kathryn Richdale, Loraine T Sinnott, Peter Wassenaar, Petra Schmalbrock, Chiu-Yen Kao, Mark A. Bullimore, and Karla Zadnik, *Investigative Ophthalmology & Visual Science, 53(14), 2229, 2012*
- Longitudinal Ciliary Muscle Growth is Not Correlated with Overall Eye Growth by Melissa Bailey, Loraine Sinnott, and Chiu-Yen Kao, *Investigative Ophthalmology & Visual Science, 52(14), 2838, 2011*
- Split Bregman Method for Minimization of region-Scalable Fitting Energy for Image Segmentation by Yunyun Yang, Chunming Li, Chiu-Yen Kao, Stanley Osher, *International Symposium on Visual Computing, 117-128, 2010*
- Image Segmentation with Simultaneous Illumination and Reflectance Estimation: An Energy Minimization Approach by Chunming Li, Fang Li, Chiu-Yen Kao, Chenyang Xu, *2009 IEEE 12th International Conference on Computer Vision (ICCV), 702-708, 2009*
- 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, *International Conference on Medical Image Computing and Computer-Assisted Intervention (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, Zhaohua Ding, and John Gore, *Proceedings 16th Scientific Meeting, International Society for Magnetic Resonance in Medicine (1), 556, 2008*
- Implicit Active Contour/Surfaces Driven by Local Binary Fitting Energy by Chunming Li, Chiu-Yen Kao, and Zhaohua Ding*, 2007 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 1-7, 2007*
- A Geometric Method for Automatic Extraction of Sulcal Fundi by Chiu-Yen Kao, Michael Hofer, Guillermo Sapiro, Josh Stern, and David Rottenberg, *3rd IEEE International Symposium on Biomedical Imaging: Nano to Macro (ISBI), 1168-1171, 2006*

- Inverse Design Problems in Electromagnetics and Nano-Photonics by Eli Yablonovitch, Chiu-Yen Kao, and Stanley Osher, *2005 Pacific Rim Conference on Lasers & Electro-Optics, IEEE, 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 *International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 663-670, 2004*

PROJECT REPORT

- Development of Image Processing Algorithms for an AFM Scanner by Paul Ashby, Max Baroi, Ghanshyam Bhatt, Chiu-Yen Kao, Mikko Kivelä, Peter Kramer, Taras Lakoba, Sean Matz, and Hamza Rusayqat, *Mathematics in Industry Reports, 34th MPI workshop 2018, 2022*

BOOK & BOOK CHAPTERS

- Computational Approaches for Extremal Geometric Eigenvalue Problems by Chiu-Yen Kao, Braxton Osting, and Edouard Oudet, *Handbook of Numerical Analysis, Volume 24, 377-406*, ISSN:1570-8659, 2023.
- Study of a Mixed Dispersal Population Dynamics Model by Marina Chugunova, Baasansuren Jadamba, Chiu-Yen Kao, Christine Klymko, Evelyn Thomas, and Bingyu Zhao, *Topics in Numerical Partial Differential Equations and Scientific Computing, 51-77, Springer New York, 2016*
- Mathematical Modeling for Biological Processes by Avner Friedman and Chiu Yen Kao, ISBN: 978-3-319-08313-1, *Springer, 2014*
- Numerical Methods for Metamaterial Design, Chapter 7 on Gradient Based Optimization Methods for Metamaterial Design by Weitao Chen, Kenneth Diest, Chiu Yen Kao, Daniel E. Marthaler, Luke A. Sweatlock, and Stanley Osher*, 175-204, Topics in Applied Physics, 127, Springer, 2013*

PATENT

- Melissa D. Bailey and Chiu-Yen Kao, Detection and Measurement of Tissue Images, U.S. Patent 9060717B2, publication date: June 23, 2015