Curriculum Vitae

Xianping Li

EDUCATION

Ph.D., Mathematics, University of Kansas, 2011

M.S., Chemical & Petroleum Engineering, University of Kansas, 2010

M.S., Oil and Gas Development Engineering, China University of Petroleum-Beijing, 2002

B.E., Petroleum Engineering, China University of Petroleum-Beijing, 2000

PROFESSIONAL POSITIONS

Assistant Professor, August 2019 -
College of Integrative Sciences and Arts,
Arizona State University (Polytechnic Campus), Mesa, AZ

Assistant Professor, 2013 - August 2019
Department of Mathematics and Statistics,
University of Missouri - Kansas City, Kansas City, MO

Visiting Assistant Professor, 2011 - 2013
Department of Mathematics, University of Central Arkansas, Conway, AR

RESEARCH INTEREST

Numerical analysis, scientific computing, numerical solutions of partial differential equations, anisotropic mesh adaptation, moving mesh finite element method, anisotropic diffusion problems, image processing, adaptive sampling, parallel computing, mathematical modeling and simulation, and computations in biology, science, finance and engineering

GRANTS

- **External Grants**

  UNFUNDED PROPOSALS

  1. *Anisotropic Mesh Adaptation Framework for Image Representation and Segmentation*, PI, NSF, submitted in 2024, $278,710, not funded.
  2. *Fitted Finite Element Method for Singularly Perturbed Problems*, PI, Simons Foundation, submitted in 2023, $42,000, not funded.
  3. *Anisotropic Mesh Adaptation Framework for Image Representation and Segmentation*, PI, NSF CAREER, submitted in 2023, $896,985, not funded.
  4. *Numerical Computations in Image Processing with Adaptive Meshes*, PI, NSF, submitted in 2020, $333,269, not funded.

5. *Numerical Computations in Image Processing with Adaptive Meshes*, PI, NSF, submitted in 2019, $330,742, not funded.

- **Internal Grants**

AWARDED GRANTS at ASU

1. *CISA Summer Research fund*, College of Integrative Sciences and Arts Seed Grant, Arizona State University, 2025, $7,500, funded.
2. *CISA Summer Research fund*, College of Integrative Sciences and Arts Seed Grant, Arizona State University, 2024, $7,500, funded.
3. *CISA Summer Research fund*, College of Integrative Sciences and Arts Seed Grant, Arizona State University, 2023, $7,500, funded.
4. *CISA Summer Research fund*, College of Integrative Sciences and Arts Seed Grant, Arizona State University, 2022, $5,000, funded.
5. *CISA Summer Research fund*, College of Integrative Sciences and Arts Seed Grant, Arizona State University, 2021, $5,000, funded.
6. *CISA Summer Research fund*, College of Integrative Sciences and Arts Seed Grant, Arizona State University, 2020, $5,000, funded.

AWARDED GRANTS at UMKC

1. *Mathematical Foundation of Finite Element Methods II*, Co-PI, University of Missouri Inter-Campus Course Sharing Grant, 2017 - 2018, $9,731, funded.
2. *Mathematical Studies on Problems in Disease Modeling and Image Processing in Context of South Africa*, Co-PI, University of Missouri South African Education Program (UMSAEP), 2017 - 2018, $4,900, funded.
3. *Bringing the Field of Applied Mathematics from Shadowed State to the Frontline Discipline*, PI (with Bani-Yaghoub, Rhee, and Vaidya), Funding for Excellence Program, University of Missouri - Kansas City, 2016, $30,000, funded.
4. *Numerical Computations in Image Processing*, (sole) PI, University of Missouri Research Board, 2015 - 2016, $18,837, funded.
5. *Modeling and Analysis of the Next Life Event - Relating Theory and Data*, PI (with Bani-Yaghoub), Development and Research Grant, H&R Block, 2014 - 2015, $60,000, funded.
6. *Mathematical Foundation of Finite Element Methods*, Co-PI, University of Missouri Inter-Campus Course Sharing Grant, 2014 - 2015, $7,769, funded.

PUBLICATIONS

- **Published Articles**

PEER-REVIEWED JOURNAL ARTICLES

1. F. Zhang, W. Huang, X. Li and S. Zhang, A study on phase-field models for brittle fracture, *International Journal of Numerical Analysis and Modeling*, 19(6): 791-819, 2022.

2. H. Zhou, K. Zhou and X. Li, Stochastic mortality dynamics driven by mixed fractional Brownian motion, *Insurance: Mathematics and Economics*, 106: 218-238, 2022.
3. M.S. Richman, X. Li and A.N. Caruso, Inadequacy of the extrapolation-length method for modeling the interface of a ferroelectric-graphene heterostructure, *Journal of Applied Physics*, vol. 125, (184103), 2019.
4. N.K. Vaidya, X. Li and F.B. Wang, Impact of spatially heterogeneous temperature on the dynamics of dengue epidemics, *Discrete & Continuous Dynamical Systems - B*, 24(1): 321-349, 2019.
5. F. Zhang, W. Huang, X. Li and S. Zhang, Moving mesh finite element simulation for phase-field modeling of brittle fracture and convergence of Newton's iteration, *Journal of Computational Physics*, 356: 127-149, 2018.
6. X. Li, Anisotropic mesh adaptation for finite element solution of anisotropic porous medium equation, *Computers and Mathematics with Applications*, 75: 2086-2099, 2018.
7. X. Li and W. Huang, Anisotropic mesh adaptation for 3D anisotropic diffusion problems with application to fractured reservoir simulation, *Numerical Mathematics: Theory, Methods and Applications*, 10(4): 913-940, 2017.
8. X. Li and W. Huang, A study on nonnegativity preservation in finite element approximation of Nagumo-type nonlinear differential equations, *Applied Mathematics and Computation*, 309: 49-67, 2017.
9. X. Li, Anisotropic mesh adaptation for image representation, *EURASIP J. Image Video Proc.* 2016: 26, 2016.
10. X. Li and W. Huang, Maximum principle for the finite element solution of time dependent anisotropic diffusion problems, *Numerical Methods for Partial Differential Equations*, 29(6): 1963-1985, 2013.
11. X. Li and W. Huang, An anisotropic mesh adaptation method for the finite element solution of heterogeneous anisotropic diffusion problems, *Journal of Computational Physics*, 229: 8072-8094, 2010.
12. W. Huang and X. Li, Anisotropic mesh adaptation method for the finite element solution of variational problems, *Finite Elements in Analysis and Design*, 46: 61-73, 2010.
13. W. Huang, L. Kamenski, and X. Li, Anisotropic mesh adaptation for variational problems using error estimation based on hierarchical bases, *Canadian Applied Mathematics Quarterly (Special issue for the 30th anniversary of CAIMS)*, 17: 501-522, 2009.
14. S. McCool, X. Li and G.P. Willhite, Flow of a polyacrylamide/chromium acetate system in a long conduit, *SPE Journal*, 14(1): 54-66, 2009.
15. S. McCool, X. Li and G. P. Willhite, Effect of shear on flow properties during placement and on syneresis after placement of a polyacrylamide-chromium acetate gelant, *Society of Petroleum Engineering*, SPE 106059-MS, 2007.
16. Q. Wen, S. Zhang, L. Wang, Y. Liu and X. Li, The effect of proppant embedment upon the long-term conductivity of fractures, *Journal of Petroleum Science and Engineering*, 55: 221-227, 2007.

CONFERENCE PROCEEDINGS

1. K. Abbas[†] and X. Li, Locally enhanced Chan-Vese model with anisotropic mesh adaptation for image segmentation, *IntelliSys 2023*, LNNS 824: 111-127, 2024. (Conference was held in 2023, proceedings published in 2024.)

2. K. Abbas† and X. Li, Anisotropic mesh adaptation for image segmentation based on Mumford-Shah functional, *AIP Conf. Proc.* 2977, 040023: 1-11, 2023.
3. X. Li and T. Wu, A preliminary comparison between compressive sampling and anisotropic mesh-based image representation, *Intelligent Computing*, Lecture Notes in Networks and Systems 283: 876-885, 2021, `https://doi.org/10.1007/978-3-030-80119-9_57`.
4. X. Li, Anisotropic mesh representation for color images, *2020 IEEE 5th International Conference on Image, Vision and Computing (ICIVC)*, Beijing, China, 2020, pp. 139-143.
5. X. Li and J. Martinez*, Quantitative comparison of white matter segmentation for brain MR images, *Advances in Computer Vision, CVC 2019*, Advances in Intelligent Systems and Computing, 943: 639-647, 2019, `https://doi.org/10.1007/978-3-030-17795-9_46`.
6. F. Zhang, W. Huang, X. Li and S. Zhang, A study on moving mesh finite element solution of phase-field models for hydraulic fracturing, *International Journal of Chemical Engineering and Applications*, 9(2): 51-57, 2018. (Conference Proceedings for ICPPE 2018.)

- **Techinical Reports**

1. X. Li, D. Svyatskiy, and M. Shashkov, Mesh adaptation and discrete maximum principle for 2D anisotropic diffusion problems, *Los Alamos National Laboratory technical report*, LA-UR 10-01227, 2007.

- **Submitted Articles**

PEER-REVIEWED JOURNAL ARTICLES

1. X. Li and M. McCoy†, Moving mesh with streamline upwind Petrov-Galerkin (MMSUPG) method for time-dependent convection dominated convection-diffusion problems, (under revision).
2. X. Li, W. Mergia and K. Patidar, A finite element discretization with semi-implicit nonlinear multistep scheme for a two-dimensional competition-diffusion system of three competing species with different mobility rates, (under review).

Note: † denotes former Ph.D. student author, and * denotes undergraduate student author. All authors contributed equally for the corresponding papers.

WORKS-in-PROGRESS

1. X. Li and K. Patidar, Fitted finite element method for singular perturbed problems, (to be submitted).
2. X. Li, Anisotropic mesh adaptation and deep learning for segmentation of images with inhomogeneous intensities, (to be submitted).

Long-term Projects

1. X. Li, Deep learning methods for moving mesh PDEs.
2. X. Li, Anisotropic mesh adaptation framework for image representation and segmentation.

3. X. Li, Computing residual diffusivity by moving mesh finite element method.
4. X. Li, MMPDE method for phase-field modeling of fracture networks.

PRESENTATIONS

- **Invited Talks**
  - 6th Coastal Bend Mathematics & Statistics Conference, Texas A&M University - Corpus Christi, (virtual), April 2022.
  - SIAM Central State Section 6th Annual Meeting, University of Kansas, (virtual), October 2021.
  - Computing Conference 2021, London, UK, (virtual), July 2021.
  - Institute of Computational Mathematics, Chinese Academy of Sciences, Beijing, June 2019.
  - College of Petroleum Engineering, China University of Petroleum-Beijing, May 2019.
  - Computation and Applied Mathematics Seminar, Arizona State University, October 2018.
  - SIAM Central States Section 3rd Annual Meeting, Colorado State University, October 2017.
  - Invited colloquium talk, Department of Mathematics and Computer Science, Benedictine College, March 2017.
  - SIAM Central States Section 2nd Annual Meeting, University of Arkansas at Little Rock, October 2016.
  - Computational and Applied Math Seminar, University of Kansas, December 2015.
  - Invited colloquium talk, Department of Physics and Astronomy, University of Missouri-Kansas City, April 2015.
  - AMS Central Spring Sectional Meeting, Michigan State University, March 2015.
  - Invited colloquium talk, Department of Mathematics and Statistics, Missouri University of Science and Technology, February 2014.
  - First Central Region Conference on Numerical Analysis and Dynamical Systems, University of Kansas, May 2013.
  - South Central Conference on Advanced Numerical Methods and Applications, University of Arkansas, Little Rock, April 2013.
  - AMS 2012 Spring Central Section Meeting, University of Kansas, March 2012.
  - Applied Mathematics Seminar, University of Arkansas at Little Rock, September 2011
- **Contributed Talks**
  - SIAM Central States Section 2024 Annual Meeting, University of Missouri - Kansas City, October 2024.
  - Finite Element Circus Spring 2024, Brown University, April 2024.
  - Intelligent Systems Conference 2023, Amsterdam, Netherlands, (virtual), September 2023.

- 2020 IEEE 5th International Conference on Image, Vision and Computing, Beijing, China, (virtual), July 2020.
- Finite Element Circus Fall 2019, Virginia Tech, November 2019.
- SIAM Southeastern Atlantic Section 43rd Annual Meeting, University of Tennessee Knoxville, September 2019.
- Computer Vision Conference 2019, Las Vegas, April 2019.
- UMKC Faculty Research Symposium, University of Missouri-Kansas City, December 2016.
- Finite Element Circus Spring 2016, University of Maryland, College Park, April 2016.
- SIAM Central States Section 1st Annual Meeting, Missouri University of Science and Technology, April 2015.
- AARMS-CRM Workshop on Adaptive Methods for PDEs, Memorial University, St. John's, NL, Canada, August 2014.
- AMS special session on Numerical Analysis and Finite Element Methods, San Diego, CA, January 2013.
- Mathematics Seminar, University of Central Arkansas, October 2012.
- Finite Element Circus Fall 2011, University of Connecticut at Avery Point, October 2011.
- Midwest Numerical Analysis Day 2010, Iowa State University, April 2010

COURSES TAUGHT

- **Arizona State University**
  - Modern Differential Equations (Fall 2019, Spring 2020, Fall 2020, Spring 2021, Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024, Spring 2025, Fall 2025)
  - Mathematical Modeling and Computation (Fall 2020, Fall 2021)
  - Introduction to Numerical Methods for Partial Differential Equations (Spring 2021, Spring 2022)
  - Engineering Analysis I (Fall 2021, Spring 2022, Fall 2022, Fall 2023, Fall 2024)
- **University of Missouri - Kansas City**
  - Elementary Statistics (Summer 2013)
  - Calculus I (Fall 2013, Summer 2014, Fall 2014, Summer 2017)
  - Calculus III (Fall 2015)
  - Accelerated Calculus I (Fall 2016, Fall 2017, Fall 2018)
  - Accelerated Calculus II (Spring 2017, Spring 2018, Fall 2018)
  - Linear Algebra I (Fall 2013, Spring 2014, Fall 2014, Fall 2015, Fall 2016)
  - Sets and Proofs (Spring 2019)
  - Introduction to Scientific Computing (Fall 2017)
  - Mathematical Modeling (Spring 2016)

  - Mathematical Methods for Science and Engineering (Spring 2015, Spring 2016, Spring 2017, Spring 2018)
  - Advanced Numerical Analysis I (Fall 2018)

- **University of Central Arkansas**
  - Plane Trigonometry (Fall 2011, Spring 2012, Fall 2012)
  - Calculus I (Fall 2011, Spring 2012, Fall 2012, Spring 2013)
  - Transition to Advanced Mathematics (Summer 2012)
  - Discrete Structures (Fall 2011, Fall 2012, Spring 2013)
  - Differential Equations (Summer 2012)
  - Finite Element & Finite Volume Methods (Spring 2013)

- **University of Kansas (as GTA)**
  - Calculus I (Fall 2008, Spring 2009, Fall 2009, Fall 2010)
  - Calculus II (Spring 2010, Spring 2011)

STUDENTS MENTORED

- **Ph.D. Students**
  - Lucero Rodriguez Rodriguez (at ASU), graduated in May 2025, Ph.D. Committee member.
  - Matthew McCoy (at UMKC), graduated in July 2021, Dissertation advisor.
  - Karrar Abbas (at UMKC), graduated in December 2020, Dissertation advisor.

- **Undergraduate Students**
  - Joseph Nunez, Fall 2025, Honors Enrichment Contract for MAT 275
  - Jesus Lara, Spring 2025, Honors Enrichment Contract for MAT 275
  - Sebastian Santos, Spring 2025, Honors Enrichment Contract for MAT 275
  - Stuart Pieloch, Fall 2023, Honors Enrichment Contract for MATH 275
  - Elsie Davis, Fall 2022, Honors Enrichment Contract for MAT 275
  - CG Schultz, Fall 2021, undergraduate research
  - Zehui Liu, Spring 2021, undergraduate research
  - Matthew Larkins, Fall 2020, undergraduate research
  - Renton Rindlisbacher, Fall 2020, undergraduate research

- **Highschool Students**
  - Jusreen Kaur, SCENE program, Spring 2022
  - Kevin Fan, 70th Greater Kansas City Science & Engineering Fair (received gold ribbon), Spring 2021

SERVICE ACTIVITIES

- **Service in unit**
  - organizer, Science and Mathematics Colloquium Series, Fall 2022 - Spring 2025
  - member, Hiring committee, Fall 2019
  - member, Reading Group, Fall 2019
- **Service in college**
  - member, ACETS, Spring 2020 - present
  - member, CISA Curriculum Committee, Fall 2021 - Spring 2025
- **Service at university**
  - member, University Undergraduate Standards Committee, Fall 2021 - Spring 2025
  - moderator, MATH lounge at the REMOTE conference, Summer 2020

PROFESSIONAL ACTIVITIES

- **Conference Organization**
  - Mini-symposiums organizer, SIAM Central States Section 2024 Annual Meeting, 2024
  - Mini-symposiums organizer, SIAM Central States Section 2021 Annual Meeting, 2021
  - Session Chair, Computer Vision Conference, 2019
  - Mini-symposiums organizer, SIAM Central States Section 3rd Annual Meeting, 2017
  - Mini-symposiums organizer, SIAM Central States Section 2nd Annual Meeting, 2016
  - Mini-symposiums organizer, SIAM Central States Section 1st Annual Meeting, 2015
- **Journal Referee**
  - Reviewer, AMS Mathematical Reviews
  - Reviewer, Applied Numerical Mathematics (APNUM)
  - Reviewer, Computers and Mathematics with Applications (CAMWA)
  - Reviewer, International Journal of Computer Mathematics (GCOM)
  - Reviewer, Journal of Applied Mathematics (JoAM)
  - Reviewer, Journal of Computational and Applied Mathematics (CAM)
  - Reviewer, Journal of Computational Physics (JCP)
  - Reviewer, Journal of Difference Equations and Applications (GDEA)
  - Reviewer, Journal of Mathematical Study (JMS)
  - Reviewer, Journal of Scientific Computing (JOMP)
  - Reviewer, Mathematical Biosciences and Engineering (MBE)
  - Reviewer, Mathematics in Applied Sciences and Engineering (MASE)
  - Reviewer, Numerical Methods for Partial Differential Equations (NMPDE)
  - Reviewer, SN Applied Sciences (SNAS)