# CARMELIZA NAVASCA

Associate Professor
University of Alabama at Birmingham
Department of Mathematics
cnavasca@uab.edu
1 205 934 2154 (office)

## EDUCATION

**University of California at Davis**
PhD in Mathematics, 2002
Advisor: Arthur J. Krener
Thesis: Local Solutions of the Dynamic Programming Equations and the Hamilton-Jacobi-Bellman PDE

**University of California at Berkeley**
BA in Mathematics, 1997

## EMPLOYMENT

**University of Alabama at Birmingham**, Department of Mathematics, Birmingham, AL
*Associate Professor* 2015 - present
*Assistant Professor* 2012 - 2015

**Clarkson University**, Department of Mathematics, Potsdam, NY
*Assistant Professor* 2008 - 2012

**Rochester Institute of Technology**, Department of Mathematics, Rochester, NY
*Assistant Professor* 2007 - 2008

**Centre National de la Recherche Scientifique (CNRS)**, Signal and Image Processing Laboratory (ETIS),
Cergy-Pontoise, FRANCE
*Postdoctoral Fellow* 2006 - 2007
Mentor: Lieven De Lathauwer

**University of California at Los Angeles**, Department of Mathematics, Los Angeles, CA
*NSF-VIGRE Assistant Professor* 2003 - 2006
Mentor: Stanley J. Osher

**University of Waterloo**, Department of Applied Mathematics, Waterloo, Ontario, CANADA
*Postdoctoral Fellow* 2002 - 2003
Mentor: Kirsten A. Morris

**University of California at Davis**, Department of Mathematics, Davis, CA
*Research and Teaching Assistant* 1997 - 2002

**NASA Ames Research Center**, Mountain View, CA
*Summer Research Assistant* 1992 - 1996

## VISITING POSITIONS, FELLOWSHIPS and ACADEMIC HONORS

May-June2022  ICERM Fellowship, Brown University, Providence, Rhode Island
Jan-May2020   ICERM Fellowship, Brown University, Providence, Rhode Island

| | |
|---|---|
| 2006 – 2007 | CNRS Postdoctoral Fellowship, France |
| 2003 – 2006 | NSF-VIGRE Postdoctoral Fellowship, UCLA |
| 2002 | Alice Leung Mathematical Prize, UC Davis Math Department |
| 2001 | Best Poster Prize, Richard Tapia Symposium 2001 |
| 2000 – 2001 | Research Mentorship Fellowship, UC Davis |
| 1999 & 2002 | Graduate Assistance in Areas of National Need Fellowship, UC Davis Math Department |
| 1992 – 1996 | NASA Junior Fellowship, NASA Ames Research Center, Mountain View, California |
| 1992 | Robert Moretti Scholarship, UC Berkeley |
| 1991 – 1992 | NASA SHARP Apprenticeship, NASA Ames Research Center, Mountain View, California |

## GRANTS

### Awarded:

- **NSF MCB 2126374, (Mattheyses, Navasca, Kawaii are PIs)**, 2023-2026, $1,199,972

- **NSF MCB 2126374, (Sztul, Navasca, Kawaii are PIs)**, 2021-2023, $1,199,972

- **NSF DMS 0915100, (Navasca is PI)**, 2009-2013, $182,142

- **Institute for a Sustainable Environment at Clarkson, (Navasca is PI)**, 2010-2011,$2500

## PUBLICATIONS

### In Preparation/Review:

1. *Learning Rank and Control for Reduced Order Models* (with Jiahua Jiang), submitted

2. *Exploring and Analyzing Wildland Fire Data via Machine Learning Techniques* (with Dipak Dulal, Joseph Charney, Michael Gallagher, Nicholas Skowronski), submitted, https://arxiv.org/abs/2311.05128

3. *Tensor Deblurring and Denoising Using Total Variation* (with Fatoumata Sanogo and Stefan Kindermann), submitted, https://arxiv.org/abs/2111.03965

### Refereed Publications:

1. *Covid-19 Pandemic Data Analysis Using Tensor Models* (with Dipak Dulal and Ramin Goudarzi), Computational Algorithm and Numerical Dimensions, 3:1 (2024)

2. *A Modified Levenberg-Marquardt Algorithm For Tensor CP Decomposition with Application in Image Compression* (with Ramin Goudarzi and Dipak Dulal), in 2024 IEEE Data Compression Conference (DCC), https://arxiv.org/abs/2401.04670

3. Decomposition for a Quaternion Tensor Triplet with Applications (with Zhuo-Heng He and Xiang-Xiang Wang), Advances in Applied Clifford Algebras (2022) **32**:9

4. *Low-rank-CP Tensor Completion* (with Jiahua Jiang, Fatoumata Sanogo), Journal of Scientific Computing, **91**, 18 (2022).

5. *Accurate Tensor Decomposition with Simultaneous Rank Approximation for Surveillance Videos* (with Ramin Goudarzi-Karimi, Guimu Guo and Da Yan), Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, October 2020.

6. *Tensor Completion via CP Decomposition* (with Fatoumata Sanogo), Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, October 2018.

7. *On Accelerating the Regularized Alternating Least Squares Algorithm for Tensors* (with Xiaofei Wang and Stefan Kindermann), Electronic Transactions on Numerical Analysis, 48, pp. 1-14, 2018

8. *Low-Rank Approximation of Tensors via Sparse Optimization* (with Xiaofei Wang), Numerical Linear Algebra Appl., 25 (2), pp. 2018

9. *Adaptive Low Rank Approximation of Tensors* (with Xiaofei Wang), 2015 IEEE International Conference on Computer Vision Workshop (ICCVW), pp. 939-945, Santiago, Chile, 2015.

10. *Higher Order Orthogonal Iteration with Random Projections for Low Multilinear Rank Tensor Approximation,* (with Nichole Pompey), in I. Hotz, T. Schultz (eds.), *Visualization and Processing of Higher Order Descriptors for Multi-Valued Data, Mathematics and Visualization*, pp. 93-106, Springer International Publishing Switzerland, 2015

11. *Iterative Methods for Symmetric Outer Product Tensor Decompositions* (with Na Li and Christina Glenn), Electronic Transactions on Numerical Analysis, 44 (2015), pp. 124-139.

12. *Tensor Restricted Isometry Property for Multilinear Sparse System for Gene Interactions,* (with Alexandra Fry), Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, November 2014.

13. *New Algorithms for Tensor Decomposition based on a Reduced Functional* (with Stefan Kindermann), Numerical Linear Algebra with Applications, 21 (3) (2014), pp. 340-374.

14. *Source Apportionment of Time and Size Resolved Ambient Particulate Matter* (with Philip Hopke, Na Li, Kumar Pramod, Steven Smith and Yongjing Zhao), J. Chemometrics and Intelligent Laboratory Systems, 129 (2013), pp. 15-20

15. *Some Convergent Results of the Regularized Alternating Least-Squares for Tensor Decomposition* (with Na Li and Stefan Kindermann), Linear Algebra and Applications, 438 (2) (2013), pp. 796-812.

16. *Solving Multilinear Systems via Tensor Inversion*[1] (with Michael Brazell, Na Li and Christino Tamon), SIAM Matrix Analysis, 34-2 (2013), pp. 542-570.

17. *Video Detection Anomaly via Low Rank and Sparse Decompositions* (with Jiebo Luo and Lam Tran), Proceedings of the IEEE New York Image Processing Workshop, Rochester, November 2012.

18. *Randomized Tensor Algorithms for Facial Recognition* (with Ryan Sigurdson), Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, November 2012.

19. *Sparseness Constraints on Nonnegative Tensor Decomposition* (with Na Li), Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers, November 2010.

20. *Approximation of Low Rank Solutions for Linear Quadratic Feedback for Partial Differential Equations* (with Kirsten Morris), Computational Optimization and Applications, 46 (1) (2010), pp. 93-111.

21. *Recovery of Tensor Data from Incomplete Measurement via Compressed Sampling* (with Jason Holloway), Proceedings of the IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, November 2009.

22. *Low Multilinear Rank Tensor Decomposition via Semidefinite Programming* (with Lieven De Lathauwer), Proceedings of the European Signal Processing Conference, Glasgow, Scotland, August 2009.

23. *Patchy Cost and Feedback for the HJB PDE* (with Arthur J. Krener), Proceedings of the Mathematical Theory of Networks and Systems, Blacksburg, Virginia, July 2008.

24. *Swamp Reducing Technique for Tensor Decomposition* (with Lieven De Lathauwer and Stefan Kindermann), Proceedings of the European Signal Processing Conference, Lausanne, Switzerland, Aug 2008.

25. *Patchy Solution of the Hamilton-Jacobi-Bellman PDE* (with Arthur J. Krener), in Chiuso, Ferrante and Pinzoni, eds, Modeling, Estimation and Control, Lecture Notes in Control and Information Sciences, 364, Springer, Berlin, pp. 251-270, 2007.

---

[1]Among the 20 most-read articles for SIAM Journal on Matrix Analysis and Applications

26. *Implementations of Control Laws of Motion Camouflage in a Pursuit-Evasion System* (with Ani Asatryan, Vatche Attarian, Yuan F. Huang, Kevin K. Leung, Abhijeet Joshi, Vlad Voroninski, Meghdi Aboulian and Krystle McBride), Proceedings of the IFIP Conference on System Modeling and Optimization, Krakow, Poland 2007.

27. *Iterative Solution of Algebraic Riccati Equations for Damped System* (with Kirsten Morris), Proceedings of the IEEE Conference on Decision and Control, San Diego 2006.

28. *Optimal Control as a Regularization Method for Ill-posed Problems* (with Stefan Kindermann), J. Inverse and Ill-posed Problems, 14 (7), pp. 685-703, 2006.

29. *The Lax-Friedrichs Sweeping Method for Optimal Control Problem in Continuous and Hybrid Dynamics* (with Chiu-Yen Kao and Stanley J. Osher), J. Nonlinear Analysis Theory, Methods and Applications, 63 (5-7), pp. 1561-1572, 2005.

30. *Iterative Solution of Algebraic Riccati Equations Using a Modified Newton-Kleinman Method* (with Kirsten Morris), Proceedings of Mathematical Theory of Networks and Systems, Brussels, Belgium 2004.

31. *Solution of Algebraic Riccati Equations Arising in Control of Partial Differential Equations* (with Kirsten Morris), in P. Zolesio and J. Cagnol, eds, Control of Distributed Parameter System, Lecture Notes in Pure and Appl. Math., vol . 240, CRC Press, Boca Raton, 259-281, 2004.

32. *Solution of Hamilton-Jacobi-Bellman equations* (with Arthur J. Krener), Proceedings of the IEEE Conference on Decision and Control, Sydney, 570-574, 2000.

**Thesis:**

33. *Local Solutions of the Dynamic Programming Equations and the Hamilton-Jacobi-Bellman PDE*, Ph.D. Thesis, University of California, Davis, 2002.

**Other Manuscripts:**

34. *Tensors as Module Homomorphisms over Group Rings* (with Michael Opperman, Timothy Penderghest and Christino Tamon), (http://arxiv.org/abs/1005.1894)

35. *Parameter Identification in Radio-Frequency Ablation* (with Hanne Tiesler and Christof Büskens), International Association of Applied Mathematiccs and Mechanics (Gesellschaft fur Angewandte Mathematik und Mechanik), March 2008.

36. *Local Stable Manifold for the Bidirectional Discrete-Time Dynamics*, (http://arxiv.org/abs/math/0309026)

37. *Web Hosting Service Level Agreements* (with Alan King et al.), IBM Research Report, RC22301, (2002), Also in Proceedings of the 5th Pacific Institute for Mathematical Sciences 2001 Industrial Problem Solving Workshop, University of Washington, Seattle, 2001.

# PRESENTATIONS

**Conferences, Workshops, etc.**

1. 2025 SIAM Conference on Control and Its Applications, Montréal, Quebec, Canada, July 2025

2. International Workshop on Matrix Analysis, Linear Algebra and Applications, Unibersidad ng Pilipinas Diliman, Quezon City, The Philippines, July 2025

3. Gave the Lewis Parker Lecture at 2025 Annual Meeting of the Alabama Association of College Teachers of Mathematics, Samford University, Birmingham, Alabama, February 2025

4. 2024 SIAM Applied Linear Algebra, Sorbonne Université, Paris, France, May 2024

5. Workshop on Sparse Tensor Computations, Discovery Partners Institute, University of Illinois System, Chicago, October 2023.

6. AMS Southeastern Sectional Meeting, Georgia Institute of Technology, Atlanta, March 2023.

7. NSF: Find Your Inner Modeler (FYIM) V, Towards Whole Cell Models, University of Illinois, Chicago, August 2022.

8. 2021 SIAM Southeastern Atlantic Section Conference, Auburn University, Septermber 2021.

9. 2020 ICERM Long Program on Model and Dimension Reduction in Uncertain and Dynamic Systems, Brown University, Providence, February 2020.

10. 2018 SIAM Annual Meeting, Portland, Oregon, July 2018.

11. 2017 SIAM Conference on Applied Algebraic Geometry, Georgia Institute of Technology, Atlanta, August 2017.

12. 2017 SIAM Conference on Computational Science and Engineering, Atlanta, Georgia, March 2017.

13. 2017 Joint Mathematics Meeting, Atlanta, Georgia, January 2017.

14. 2015 SIAM Conference on Applied Linear Algebra, Atlanta, Georgia, October 2015.

15. Mathematics in Data Science, Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, July 2015.

16. 2014 SIAM Annual Meeeting, Chicago, Illinois, July 2014.

17. 2014 SIAM Conference on Optimization, San Diego, California, May 2014.

18. Joint Program Meeting, University of Alabama at Huntsville, November 2012.

19. RTG Workshop on Tensors and their Geometry in High Dimensions, University of California, Berkeley, October 2012.

20. International Conference on Spectral Theory of Tensor, Chern Institute, Nankai University, Tianjin, China, May 2012.

21. 5th Biennial Regional Meeting on Nonlinear Control and its Applications Meeting, University of Toronto, Canada, May 2012.

22. AFOSR-NSF Workshop on Computational Issues in Nonlinear Control, Monterey, California, November 2011.

23. 9th SIAM Conference on Control and Its Applications, Baltimore, Maryland, July 2011.

24. Workshop on Tensor Decompositions and Applications (TDA 2010), Monopoli, Bari, Italy, Sept 2010.

25. 2010 SIAM Annual Meeting, Minisymposium on Tensor Computations and Applications, Pittsburgh, Pennsylvania, July 2010.

26. AFOSR Workshop on Computational Issues in Nonlinear Control, Monterey, California, November 2009.

27. 17th European Signal Processing Conference, Glasgow, Scotland, August 2009.

28. Conference on Applied Inverse Problems, Vienna, Austria, July 2009.

29. 8th SIAM Conference on Control and Its Applications, Minisymposium on Model Development and Control Design for Hysteretic Systems, Denver, Colorado, July 2009.

30. 8th SIAM Conference on Control and Its Applications, Minisymposium on Numerical Solution of Riccati Equations, Denver, Colorado, July 2009.

31. AFOSR Conference on Sensing, Surveillance and Navigation, Arlington, Virginia, June 2009.

32. 16th European Signal Processing Conference, Lausanne, Switzerland, Aug 2008.

33. Mathematical Theory of Networks and Systems, Blacksburg, Virginia, July 2008.

34. Applied and Computational Harmonic Analysis, 5th World Congress of Nonlinear Analysts, Orlando, Florida, July 2008.

35. 3rd Biennial Regional Meeting on Nonlinear Control and its Applications Meeting, Waterloo, Canada, May 2008.

36. International Conference of Modeling, Estimation and Control, *in honor of Giorgio Picci's 65th Birthday*, Venice, Italy, October 2007.

37. 23rd IFIP Conference on System Modeling and Optimization, Krakow, Poland, July 2007.

38. 7th SIAM Conference on Control and Its Applications, San Francisco, California, June 2007.

39. 45th IEEE Conference on Decision and Control, San Diego, California, December 2006.

40. 22nd IFIP Conference on System Modeling and Optimization, Turin, Italy, July 2005.

41. 6th SIAM Conference on Control and Its Applications, New Orleans, Louisiana, July 2005.

42. 4th Annual Systems and Control Symposium, School of Engineering and Applied Sciences, University of California, Los Angeles, May 2005.

43. 10th Southern California Nonlinear Control Workshop, University of California, San Diego, May 2005.

44. Coupled Problems, Processes, and Phenomena: Modelling, Control, and Analysis, 4th World Congress of Nonlinear Analysts, Orlando, Florida, June 2004

45. 21st IFIP Conference on System Modelling and Optimization, INRIA, Sophia Antipolis, France, July 2003.

46. GO++ Winter School on Numerical Methods for HJ/HJB Problems, INRIA, Rocquencourt, France, December 2002.

47. Symposium on New Trends in Nonlinear Dynamics and Control and Their Application, *in celebration of Arthur J. Krener's 60th Birthday*, Monterey, California, October 2002.

48. Richard Tapia Symposium, Houston, Texas, October 2001.

49. 5th PIMS Industrial Problem Solving Workshop, University of Washington, Seattle, June 2001.

50. 2001 SIAM Annual Meeting, San Diego, California, July 2001.

### Invited Seminars and Colloquia

1. Mathematics Colloquium, University of Nevada at Reno, March 2026.

2. Institute of Mathematics Seminar, Unibersidad ng Pilipinas Diliman, Quezon City, The Philippines, July 2025.

3. Seminar, Hofstra University, Hempstead, New York, March 2024.

4. Mathematics Colloquium, SUNY Geneseo, New York, April 2021. (Virtual Talk)

5. Computational Mathematics Seminar, hosted by Michigan State University and Rensselaer Polytechnic University, March 2020. (Virtual Talk)

6. Mathematics Colloquium, University of Tennessee at Chattanooga, July 2019.

7. Mathematics Colloquium, University of Alabama at Birmingham, Alabama March 2019.

8. Computer Science Colloquium, Rutgers University, New Brunswick, New Jersey, May 2015.

9. Algebra and Linear Algebra, Auburn University, Alabama, April 2015.

10. Physics Colloquium, University of Alberta at Edmonton, Canada, July 2014.

11. Computer Science Seminar, Institute of Computer Science, Universität Bonn, Germany, July 2013.

12. Seminar, Fraunhofer Medical Image Processing and Visualization (MeVis) Laboratory, Bremen, Germany, July 2013.

13. Math Colloquium, Università di Firenze, Italy, June 2013.

14. Mechanical Engineering Seminar, University of Alabama at Birmingham, March 2013.

15. Computer and Information Sciences Seminar, University of Alabama at Birmingham, October 2012.

16. Applied Math Colloquium, Naval Postgraduate School, Monterey, California, July 2012.

17. Math Colloquium, University of Alabama at Birmingham, February 2012.

18. Scientific Computing and Numerics Seminar, Cornell University, Ithaca, October 2011.

19. Research Seminar, School of Mathematics, Institute for Advanced Study, Princeton, New Jersey, May 2011.

20. Center for Research Computing, University of Rochester, March 2011.

21. Optimization Seminar, Department of Mathematics, University of California at Davis, June 2010.

22. Applied Math Colloquium, Radon Institute for Computational and Applied Math, Kepler Universität, Linz, Austria, August 2009.

23. Applied Math Colloquium, University of Waterloo, Canada, February 2009.

24. Math Colloquium, Memorial University of Newfoundland, St. John's, Canada, November 2008.

25. Applied Math Colloquium, Naval Postgraduate School, Monterey, California, July 2008.

26. Mathematics, Informatics, and Decision Sciences Department, Sandia National Lab, Livermore, California, June 2008.

27. Math Colloquium, San José State University, California, March 2008.

28. Math Colloquium, Clarkson University, Potsdam, New York, February 2008.

29. Math Colloquium, Georgetown University, Washington DC, January 2008.

30. Center of Complex Systems and Visualization, Department of Mathematics and Computer Science, Universität Bremen, Germany, August 2007.

31. Math Colloquium, Rochester Institute of Technology, New York, June 2007.

32. Applied Math Colloquium, University of Waterloo, Canada, June 2007.

33. Institute of Industrial Technology and Management, Control Systems and Engineering, Rijksuniversiteit Groningen, The Netherlands, June 2007.

34. Signal and Image Processing Lab (ETIS), CNRS, Ecole National Superieure de l'Electronique et de ses Applications, Cergy-Pontoise, France, September 2006.

35. Applied Math Colloquium, University of Maryland Baltimore County, February 2006.

36. Math Colloquium, Western Washington University, Bellingham, January 2006.

37. Center for Systems, Dynamics, and Control, School of Engineering and Applied Sciences, University of California, Los Angeles, November 2003.

38. Applied Math Colloquium, University of Southern California, Los Angeles, November 2003.

39. Applied Math Colloquium, University of California, Los Angeles, October 2003.

40. Computational and Applied Math Colloquium, Rice University, Houston, February 2003.

41. Applied Math Colloquium, University of Waterloo, Ontario, Canada, March 2002.

42. Center for Control Engineering and Computation, University of California, Santa Barbara, November 2001.

## Outreach Talks

1. Sigma Xi Honor Society, The Scientific Research Honor Society, University of Alabama at Birmingham, Alabama, January 2023

2. Workshop to Forge the Yellowhammer Network of Alabama Women in the Mathematical Sciences, University of Alabama, Tuscaloosa, February 2022.

3. Alabama Zeta Chapter of Kappa Mu Epsilon (National Mathematics Honor Society), Birmingham Southern College, April 2018.

4. Math Club, University of Montevello, Alabama, March 2016.

5. The Theodore Haddin Arts and Sciences Forum, College of Arts and Sciences, University of Alabama at Birmingham, January 2014.

6. Science Cafe, Clarkson University, October 2010.

7. NSF-REU Seminar, Department of Mathematics, SUNY Potsdam, June 2009.

8. Graduate Student Outreach Seminar, University of California, Los Angeles, May 2005.

9. Women in Mathematics, University of Waterloo, March 2003.

## Schools and Workshops Participation:

1. NSF: Find Your Inner Modeler (FYIM) VI, Modeling Across Spatio-temporal Scales, University of Alabama at Birmingham, August 2023.

2. Spring Reunion 2022: Model and dimension reduction in uncertain and dynamic systems, The Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, May 23- June 10, 2022.

3. Model and dimension reduction in uncertain and dynamic systems, The Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, Januray 27- May 1, 2020.

4. Mathematics in Data Science, The Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, July 28-30, 2015.

5. Women and Mathematics Program: Sparsity and Computation, Institute of Advanced Study, Princeton, May 16-27, 2011.

6. NSF-FRG Workshop on Quantum Spin Systems and Quantum Information Theory, University of Rochester, May 21-25, 2010.

7. 4th Biennual Regional Meeting on Nonlinear Control and its Applications, Queen's University, Kingston, Ontario, May 13-15, 2010.

8. 2010 Computational Optimization for Tensor Decompositions, American Institute of Mathematics, Palo Alto, California, March 29-April 2, 2010.

9. IPAM, Numerical Tools and Fast Algorithms for Massive Data Mining, Search Engines and Applications, University of California, Los Angeles, October 22-25, 2007.

10. IMA, Compressive Sampling and Frontiers of Signal Processing, University of Minnesota, Minneapolis, June 4-15, 2007

## TECHNICAL and LANGUAGE SKILLS

- Computer Languages: Matlab (Image Processing, Deep Learning, Optimization, Statistics and Machine Learning, Control Systems), Python (NumPy, Pandas, TensorFlow, PyMC3, PyTorch, Pyomo), C/C++, Fortran, Maple, Mathematica
- Platforms: Mac OS, Linux, Windows
- Languages: English, French, Spanish, Tagalog

## UNIVERSITY SERVICE

- CAS Interdisciplinary Team Proposal Reviewer, Dec 2012

- UAB STEM Scholarship Committee: review internal Goldwater applicants (as well as other national fellowships), Jan 2013-Dec 2014

- UAB CIA-JFR Member: attend meetings for potential partner institution/funding agency (IBM, Alabama Power, Fidelity, UAB Bio and Medical Communities) and workshops (Big Data Workshop), Sept 2012-2014

- UAB Math Chair Job Candidate Search Committee, 2018-2019

- UAB Math Job Candidate Search Committee, 2013-2014, 2014-2015, 2021-2022, 2022-2023

- UAB Computer Science Job Candidate Search Committee, 2016-2017, 2020-2021, 2023-2024 (6 positions)

- UAB Math Colloquium Organizer, 2014-2015

- UAB College of Arts and Science Data and Digital Literacy Committee 2020-2021

- UAB College of Arts and Science Digital Literacy across the Curriculum Subcommittee 2020-2021

- UAB JPE Committee on Linear and Numerical Algebra, Spring 2015, Fall 2015, Spring 2016 (chair), Spring 2017 (chair), Fall 2017, Spring 2018 (chair), Fall 2018, Spring 2019, Fall 2019 (chair), Spring 2022 (chair), Fall 2022 (chair), Spring 2024, August 2024

- UAB Undergraduate Committee, Applied Math and Scientific Computation Director, Sept 2015 - Sept 2021

- UAB Mathematics Department Associate Chair/Undergraduate Program Director, Sept 2021 - Nov 2022

- UAB Grievance and Termination Hearing Panel Member, July 2020 -

- UAB Blazer Core Curriculum Assessor for Math 260, July 2022 - Nov 2022

- UAB Blazer Core Curriculum Assessment Scoring Group for History and Meaning, July 2025

- PhD Thesis Committee Member: Brendan Mascarenhas (Mech Eng, Clarkson, 2009), Ahmad Almomani (Math, Clarkson, 2012), Song Gao (CS, UAB, 2012-2014), Kwadwo Antwi Fordjour (Math, UAB, 2015-2016), Brett Skinner (Math, UAH, 2017-2018), Michael Pogwizd (Math, UAB, 2017-), Xinpeng Liao (CS, UAB, 2017-2019), Abinash Nayak (Math, UAB, 2018-2019), Ramin Goudarzi Karim (Math, UAB, 2018-2019), Fatoumata Sanogo (Math, UAB, 2020-2021), Guimu Guo (CS, UAB 2021-2022), Dipak Dulal (Math, UAB, 2022-2024), Joshua Vaughan (Math, UAH, 2024-), Md Abdul Aziz (Math, UAB, 2025-)

## PROFESSIONAL SERVICES

- Organizer: (co-organizing with Anna Konstorum, Institute for Defense Analyses, Maryland) Minisymposium on New Advancements in Tensor Decomposition and Computation, 27th International Conference of the Linear Algebra Society (ILAS 2026), Virginia Tech, Blacksburg, May 18-22, 2026

- Organizer: International Workshop on Matrix Analysis, Linear Algebra and Applications, International Linear Algebra Society (ILAS), University of the Philippines Diliman, Manila, July 2025

- Organizer: Minisymposium on Tensors in Control Systems, 2025 SIAM Conference on Control and Its Applications, Montréal, Canada, July 2025

- Organizer: Minisymposium on Matrix and Tensor Computations in Recent Applications of Biological Sciences, 2024 SIAM Applied Linear Algebra, Sorbonne Université, Paris, France, May 13-17, 2024

- Organizer: (co-organizing with Elizabeth Newman, Emory University and Fatou Sanogo, Bates College) Special Session on Recent Advances in Imaging Sciences, 2023 AMS Sectional Meeting, Georgia Tech, Atlanta, March 18-19, 2023.

- Organizer: (co-organized with Martin Mohlenkamp, Ohio University) Minisymposia on Tensor Advances in Many Directions, 2018 SIAM Annual Meeting, Portland, Oregon, July 9-13, 2018.

- Organizer: (co-organized with Yangyang Xu, University of Alabama) Minisymposia on Optimization Methods and Parallel Computing for Tensor Problems, 2017 SIAM Conference on Computational Science and Engineering, Atlanta, February 27- March 3, 2017.

- Organizer: (co-organized with Dana Lahat, Gipsa-Lab, France and Mariya Ishteva, Vrije Universiteit Brussel, Belgium) Minisymposia on Matrix and Tensor Decompositions and Applications, 2015 SIAM Applied Linear Algebra, Atlanta, October 26-30, 2015.

- Organizer: (co-organized with Yanni Zheng, UAB) Hosting the SIAM Southeastern Atlantic Section Conference, Birmingham, March 20-22, 2015.

- Organizer: Minisymposia on Tensor Analysis, Computation and Application, 2014 SIAM Annual Meeting, Chicago,July 7-11, 2014.

- Organizer: (co-organized with Christino Tamon, Clarkson University) Minisymposia on Tensor Computation and Applications, 2010 SIAM Annual Meeting, Pittsburg, July 12-16, 2010.

- Organizer: (co-organized with Stefan Kindermann, Kepler Universität) Minisymposium on Inverse and Ill-Posed Problems in Tensor Decomposition, 2009 Applied Inverse Problem, Vienna, July 20-24, 2009.

- Organizer: (co-organized with Tobias Presseur, Universität Bremen) Minisymposia on "Optimization in Biomedical Applications," SIAM Conference on Optimization, Boston, May 10 - 13 2008.

- Organizer: (co-organized with Wei Kang, Naval Postgraduate School) Minisymposium on "Partial Differential Equations in Control Theory," SIAM Conference on Control and Its Application, San Francisco, June 29 - July 1st 2007.

- Referee Work: IEEE Transactions on Automatic Control, SIAM Journal on Numerical Analysis, SIAM Journal of Matrix Analysis, SIAM Journal on Control and Optimization, Transactions on Image Processing, Linear Algebra and its Applications, BIT Numerical Mathematics, Computational and Applied Mathematics, Linear and Multilinear Algebra, Journal of Signal Processing, Robotics and Autonomous System, Chemometrics and Intelligent Laboratory Systems, Linear and Multilinear Algebra, Electronic Journal Linear Algebra, ICCV, Proceedings of the European Signal Processing Conference, Proceedings of the American Control Conference, Proceedings IEEE Conference of Control and Decision, Proceedings of European Control Conference, IEEE Transactions on Control Systems Technology, Journal of Franklin Institute, Journal of Magnetic Resonance, Quarterly Journal of Mechanics and Applied Mathematics, International Journal of Computer Mathematics, American Mathematical Monthly, Numerical Algorithms, Journal of Computational and Applied Mathematics Bulletin des sciences mathématiques

- AWM Mentor: Mentoring women graduate students, February 2001-present.

- NSF Panel Reviewer, March 2010, April 2019, December 2019, May 2023

- External Dissertation Reviewer: Arizona State (2010)

- Annual K-8 Mohawk Science Judge, 2009

- Moody's Mega Math Challenge Judge, 2010, 2011

# TEACHING ACTIVITIES

**Teaching Activities at UAB.**

- Calculus I. (Fall 2012, Spring 2013, Fall 2013, Fall 2014, Fall 2015)

- Calculus II. (Spring 2014)

- Intro to Linear Algebra. (Spring 2017, Fall 2017, Fall 2018, Fall 2020, Fall 2021, Spring 2023, Fall 2023, Spring 2024, Fall 2024, Spring 2025, Fall 2025)

- Intro to Optimization. (Spring 2018, Spring 2019, Spring 2021, Spring 2024)

- Scientific Programming. (Fall 2013, Fall 2014, Fall 2015, Fall 2018, Fall 2020, Spring 2021, Fall 2021, Fall 2022, Spring 2023, Spring 2025, Fall 2025)

- Mathematical Modeling. (Spring 2014, Spring 2015)

- Convex Optimization. (Spring 2016)

- Differential Equations (Graduate Level). (Fall 2017)

- Linear Algebra (Graduate Level). (Fall 2020, Fall 2023, Fall 2024)

- Numerical Linear Algebra (Graduate Level). (Spring 2015, Spring 2016, Spring 2017, Spring 2018, Spring 2019, Spring 2022, Spring 2024)

- Special Topics Course in Tensor Decompositions and Algorithms (Graduate Level). (Fall 2023)

- Special Topics Course in Advanced Numerical Linear Algebra (Graduate Level). (Fall 2015, Summer 2025)

- Special Topics Course in Mathematical Machine Learning (Graduate Level). (Fall 2018, Fall 2021, Spring 2022)

- Special Topics Course in Mathematical Information Theory (Graduate Level). (Fall 2014, Spring 2015)

- Special Topics Course in Control and Optimization (Graduate Level). UAB (Spring 2014)

- Special Topics Course in Optimization Methods (Graduate Level). UAB (Summer 2025, Spring 2026)

**Courses Taught at Previous Universities**

- Special Topics Courses in Numerical Analysis: Matrix and Tensor Decomposition, Sparse Factorization, Numerical Analysis in High Dimension, and Optimization (Graduate Level). Clarkson (Fall 2009, Spring 2010, Fall 2010, Fall 2011, Spring 2012)

- Seminar: Mathematical Writing (Graduate Level). Clarkson (Spring 2012)

- Numerical Linear Algebra (Graduate Level). Clarkson (Fall 2011)

- Numerical Analysis (Graduate level). Clarkson (Fall 2010)

- Fundamentals of Scientific Computing (Graduate level). Clarkson (Fall 2009)

- Finite Element Method (Graduate level). Clarkson (Fall 2008)

- Mathematical Control Theory (Graduate level). UCLA (Spring 2005)

- Differential Equations (Graduate level). UAB (Fall 2017)

- Numerical Differential Equations (Graduate level). UCLA (Fall 2004)

- Linear Algebra. Clarkson (Spring 2010)

- Boundary Value Problems. Clarkson (Spring 2009, Spring 2012)

- Optimization. UCLA (Spring 2006)

- Numerical Methods. UCLA (Fall 2003, Winter 2004, Winter 2005) and Clarkson (Fall 2009, Fall 2010)

- Mathematical Modeling. UCLA (Spring 2004, Winter 2006), Clarkson (Spring 2010)

- Differential Equations. UC Davis (Spring 1999), UCLA (Fall 2005) and Clarkson (Fall 2011, Spring 2012)

- Vector Calculus (Calculus III). RIT (Winter 2008) and Clarkson (Spring 2009)

- Matrices and Boundary Value Problems. RIT (Spring 2008)

- Calculus II. RIT (Fall 2007)

- Calculus I. UC Davis (Summer 1999), University of Waterloo (Fall 2002)

## Research supervising

Postdoctoral Scholars

- Xiaofei Wang, PhD (2010) in Mathematics, Northeast Normal University, China. Visiting UAB 2014-2015.
  Research Project: Tensor methods and sparse optimization with applications to surveillance videos (published three papers)
  Current Position: Assistant Professor, Key Laboratory for Applied Statistics of MOE, School of Mathematics and Statistics, Northeast Normal University, China.

PhD Students

- Hafiz Rehman, PhD (projected 2029) in Mathematics, University of Alabama at Birmingham
  Research Project: Tensor Equations in Control Systems and Optimization
  Current Position: Graduate Student at UAB

- Dipak Dulal, PhD (2024) MS (2020) in Mathematics, University of Alabama at Birmingham
  PhD Thesis: Optimization and Machine Learning Techniques For Analyzing Spatiotemporal Data Dynamics
  Current Position: Tenure-track Assistant Professor in the Department of Mathematics at Eastern New Mexico University, Portales, New Mexico
  Awarded the National Science Foundation Mathematical Sciences Graduate Internship (NSF-MSGI) at USDA USDA Forest Service, Northern Research Station, a subsidiary of the Oakridge National Laboratory, Awarded the 2024 Dean's Award for Outstanding Graduate Student in the College of Arts and Science

- Fatoumata Sanogo, PhD (2021) MS (2017) in Mathematics, University of Alabama at Birmingham
  PhD Thesis: Tensor Completion and Total Variation Denoising and Deblurring in Tensor Spaces
  First Position: Visiting Assistant Professor at Department of Statistical and Data Sciences at Smith College, Northampton, MA
  Current Position: Tenure-track Assistant Professor in the Department of Mathematics at Bates College, Lewiston, Maine
  Awarded the 2021 Dean's Award for Outstanding Graduate Student in the College of Arts and Science

- Ramin Goudarzi Karim, PhD (2019) in Applied Mathematics, University of Alabama at Birmingham
  PhD Thesis: Tensor Decomposition and Rank Approximation of Tensors with Applications to Machine Learning
  First Position: Assistant Professor in the Department of Mathematics at Stillman College, Tuscaloosa, AL
  Current Position: Tenure-track Assistant Professor in the Department of Computational and Information Sciences at Stillman College, Tuscaloosa, AL

- Na Li, PhD (2013) in Mathematics, Clarkson University
  PhD Thesis: Variants of the ALS Method for Tensor Decomposition with Applications (published five papers)
  First Position: Software Engineer at MathWorks, Boston.
  Current Position: Senior Team Lead - Software Engineer at MathWorks, Boston.
  Supported by NSF DMS 0915100 (PI: Navasca)

MS Students

- Priscilla Moyana, BS/MS (2025) in Mathematics, University of Alabama at Birmingham
  Project: Analysis of FRAP Data in Protein Interactions in Molecular and Cell Biology
  Current Position: BS/MS Student at UAB
  Supported by NSF MCB 2126374 (PI: Sztul, Navasca)

- Eleanor Cutcliffe, BS/MS (2024) in Mathematics, University of Alabama at Birmingham
  Project: Deep Neural Networks for Modeling Protein Interactions in Molecular and Cell Biology
  Current Position: Data Analyst at Airbus
  Supported by NSF MCB 2126374 (PI: Sztul, Navasca)

- Ashlea Posey, BS/MS (2021) in Mathematics, University of Alabama at Birmingham
  Project: Origami Inspired Robotics and 3D Printing, Solving Differential Equations in High Dimensions
  Current Position: High School Math Teacher at Oneonta High School, AL

- Chrissy Spero, BS in Mathematics, University of Alabama at Birmingham, 2016, MS in Mathematics, University of Alabama at Birmingham, 2018
  Project: Deep Learning Algorithms
  Current Position: Senior Model Development Manager, Spero Risk Associates

- Christina Glenn, PhD in Biostatistics (2021), MS (2015) in Mathematics, University of Alabama at Birmingham
  Project: Canonical Polyadic Decompositions with Applications (published one paper)
  Current Position: Tenure-track Assistant Professor at University of Alabama

- Nichole Pompey, MS (2014) in Mathematics, University of Alabama at Birmingham, MS in Biostatistics, University of Alabama at Birmingham, 2020
  Project: Randomized Numerical Linear Algebra (published one paper)
  Current Position: Biostatistician at Rho, Raleigh, NC

- Abdoulaye Bagayoko, MS (2007) and PhD (2010) in Electrical Engineering, Université de Cergy-Pontoise and Ecole Nationale Superieure de l'Electronique et de ses Applications (ENSEA), France
  Master's Thesis: Tensor Decomposition in the Presence of Non-Gaussian Noise
  Current Position: Security Engineer at Ericsson, France

Other Graduate Students

- Lam Tran, MS (2008) in Mathematics/Statistics/Computer Science, University of Rochester
  Project: Applications of Compressed Sensing in Image/Video Analysis (published one paper)
  Current Position: Engineer at Samsung, San Jose, California

- Michael Brazell, MS (2009) and PhD (2012) in Mechanical Engineering, Clarkson University (Advisor: Brian Helenbrook)
  Project: Numerical Multilinear Algebra Methods (published one paper)
  Current Position: Senior Engineer at National Renewable Energy Laboratory

Undergraduate Students

- Joseph Holdsworth, BS (2028) in Mathematics and Physics, University of Alabama at Birmingham
  Project: Optimal Control and Differential Games
  Current Position: BS Student at UAB
  Supported by NSF MCB 2126374 (PI: Mattheyses, Navasca)

- Mai Ellington, BS (2025) in Mathematics and Genetics and Genomic Sciences, University of Alabama at Birmingham
  Project: Reduced Order Modeling of Control Systems
  Current Position: BS Student at UAB
  Supported by NSF MCB 2126374 (PI: Mattheyses, Navasca)

- Priscilla Moyana, BS/MS (2025) in Mathematics, University of Alabama at Birmingham
  Project: Analysis of FRAP Data in Protein Interactions in Molecular and Cell Biology
  Current Position: BS/MS Student at UAB
  Supported by NSF MCB 2126374 (PI: Sztul, Navasca)

- Eleanor Cutcliffe, BS/MS in Mathematics, University of Alabama at Birmingham (expected 2024) Project: Deep Neural Networks for Modeling Protein Interactions in Molecular and Cell Biology
  Current Position: Data Analyst at Airbus
  Supported by NSF MCB 2126374 (PI: Sztul and Navasca)

- Marianne Abraham, BS/MS Biomedical Engineering, University of Alabama at Birmingham (expected 2024)
  Project: Machine Learning Based Imaging Analysis for Biomedical Images
  Current Position: Medtronic CRM Clinical Specialist
  Supported by NSF MCB 2126374 (PI: Sztul and Navasca)

- Colton Herren, BS in Mathematics, University of Alabama at Birmingham, 2022, MS in Computer Science, University of Colorado at Boulder
  Project: Deep Neural Networks for Modeling Protein Interactions in Molecular and Cell Biology
  Current Position: Data Analyst/Software Engineer
  Supported by NSF MCB 2126374 (PI: Sztul and Navasca)

- Chrissy Spero, BS in Mathematics, University of Alabama at Birmingham, 2016, MS in Mathematics, University of Alabama at Birmingham, 2018
  Project: Deep Learning Algorithms
  Current Position: Senior Model Development Manager, Spero Risk Associates

- Elizabeth Liddle, BS/MS in Mathematics, University of Alabama at Birmingham, 2020.
  Project: Optimization in Tensor Decomposition

- Andrew Arnold, BS/MS in Mathematics, University of Alabama at Birmingham, 2017, PhD and MS in Economics, University of Pennsylvania
  Project: Multilinear Algebra
  Current Position: Economist, US Department of Justice.

- Tandin Dorji, BS in Mathematics, University of Alabama at Birmingham, 2015, MS in Biostatistics, University of Vermont, 2017
  Project: Tensor SVD for Time Series Analysis
  Current Position: Fellow at Oakridge Institute, Center of Control Disease (CDC), Atlanta, Georgia.

- Alexandra Fry, BS in Mathematics, University of Alabama at Birmingham, 2015, MD, University of Alabama at Birmingham, 2020
  Project: Solving Sparse Multilinear Systems for Gene Interactions Analysis (published one paper)
  Current Position: Physical Medicine & Rehabilitation Residency at Beaumont Taylor

- Zach Carter (met with me to learn Numerical Analysis/Optimization, advised by Aaron Lucius, Chemistry, UAB), BS in Math/Chemistry, University of Alabama at Birmingham, 2015, PhD in Chemistry, University of Alabama at Birmingham, 2021
  Project: Numerical Analysis in Chemical Kinetics

- Jarrod Hicks (read with me, June-July 2013), BS/MS in Mathematics, University of Alabama at Birmingham, 2016
  Project: Tensors and the Human Brain Connectome
  Current Position: PhD Student in Neuroscience, MIT

- Andrew Doyle, BS in Physics/Chemical Engineering, Clarkson University, 2012, PhD in Chemical Engineering, Stanford University
  Project: Tensor Computation in Controlling Nanostructures
  Current Position: Product Support Engineer at OSIsoft, Stanford, CA

- Alexander Thomas, BS in Math and CS, Clarkson University, 2012
  Project: Tensor Symmetries in Sudoku Puzzles

- Ryan Sigurdson, BS in Mathematics and Economics, University of Rochester, 2012, MS in Operations Research, Cornell University, 2014
  Project: Randomized Tensor Algorithms for Data Mining (published one paper)
  Current Position: Senior Analytics Manager at Wayfair, Boston, MA
  Supported by NSF DMS 0915100 (PI: Navasca)

- Melissa Shepard, BS in Mathematics, Clarkson University, 2012
  Project: Higher-Order Tensor Visualization and Representation
  Supported by NSF DMS 0915100 (PI: Navasca)

- Maggie Leung, BS in Chemical Engineering, Clarkson University, 2012, MS in Biomedical Engineering, University of Virginia, 2016
  Project: Tensor Computation in Environmetrics
  Current Position: Engineer at GRAIL, San Jose, CA
  Supported by NSF DMS 0915100 (PI: Navasca)

- Jason Holloway, BS in Physics/EE/Math, Clarkson University, 2010, PhD in Electrical Engineering, Rice University, 2016
  Project: Recovery of Tensor Data via Compressed Sensing (published one paper)
  Current Position: Camera Algorithms Engineer at Apple, Cupertino, CA
  Supported by NSF DMS 0915100 (PI: Navasca)

- Meghdi Aboulian, BS in Mathematics, UCLA, 2007, M.S. in Mathematics, USC, 2009
  Topic: Mathematical modeling of motion camouflage (NSF-REU Project, published one paper)
  Current Position: Engineer at Raytheon, Los Angeles, Calfornia
  Supported by NSF RTG DMS 0601395 (PI: Bertozzi)

- Ani Asatryan, BS in Mathematics, UCLA, 2007, PhD in Mathematics, UC Irvine, 2016
  Topic: Analysis of pursuit-evasion system (NSF-REU Project, published one paper)
  Current Position: Engineering Manager at Aerospace, Los Angeles, CA
  Supported by NSF RTG DMS 0601395 (PI: Bertozzi)

- Vatche Attarian, BS in Engineering, Harvey Mudd, 2007, PhD in Mechanical Engineering, Imperial College London, 2014
  Topic: Numerical methods for solving pursuit-evasion system (NSF-REU Project, published one paper)

Current Position: Noise & Vibration Engineer at Apple, Cupertino, California
Supported by NSF RTG DMS 0601395 (PI: Bertozzi)

- Krystle McBride, BS in Mathematics, Harvey Mudd College, 2007
  Topic: Dynamic coordinated control laws in multiple agent models (NSF-REU Project, published one paper)
  Current Position: Engineer at AECOM, Oakland, California
  Supported by NSF RTG DMS 0601395 (PI: Bertozzi)

- Hai Nguyen, BS in Mathematics, UCLA, 2005, PhD in Statistics, UCLA, 2010
  Topic: Level set methods
  Current Position: Senior Statistician at Caltech/ NASA Jet Propulsion Laboratory

- Celeste Velasquez, BS in Mathematics, UCLA, 2005
  Topic: Artificial fish modeling
  Current Position: Data Analytics Manager at Facebook, San Francisco, CA