Ekaterina Rapinchuk (Merkurjev)

Contact Information

E-mail: merkurje@msu.edu
Site: http://users.math.msu.edu/users/kmerkurev/

Employment

- Tenure-Track Assistant Professor, Michigan State University — August 2018 - present
  - Department of Mathematics and CMSE
- Assistant Professor, Michigan State University — August 2016 - July 2018
  - Department of Mathematics and CMSE
- UC President's Postdoctoral Scholar, UCSD — July 2015 - July 2016
  - Department of Mathematics

Education

- Ph.D., Applied Mathematics, UCLA — June 2015
  Advisor: Andrea Bertozzi
- B.S./M.S. (Joint Program), Applied Mathematics, UCLA — June 2010

Research Interests

Graph-based methods, semi-supervised learning, image processing. Applications include classification of high-dimensional data.

Publications [1]

26. Hayes, N., Merkurjev, E., Wei, G.-W., *A Persistent Sheaf Laplacian Model for Protein Flexibility Analysis*, in preparation.
25. Bhusal, G., Miller, K., Merkurjev, E., *MALADY: Multistage Active Learning with Auction Dynamics on Graphs*, in preparation.
24. Hayes, N., Merkurjev, E., Wei, G.-W., *Graph-based Bidirectional Transformer Decision Threshold Algorithm for Class Imbalanced Molecular Data*, accepted in the Journal of Computational Biophysics and Chemistry, 2024.
23. Bhusal, G., Merkurjev, E., Wei, G.-W., *Persistent Laplacian-enhanced Algorithm for Scarcely Labeled Data Classification*, accepted in Machine Learning, 2024.
22. Dou, B., Zhu, Z., Merkurjev, E., Ke, L., Chen, L., Jiang, J., Zhu, Y., Liu, J., Zhang, B., Wei, G.-W., *Machine Learning Methods for Small Data Challenges in Molecular Science*, Chemical Reviews, 123(13), pp. 8736-8780, 2023.
21. Hayes, N., Merkurjev, E., Wei, G.-W., *Integrating Transformer and Autoencoder Techniques with Spectral Graph Algorithms for the Prediction of Scarcely Labeled Molecular Data*, Computers in Biology and Medicine, Volume 153, February 2023 issue, Article 106479, 2023.
20. Merkurjev, E., *Efficient Graph-based Spectral Techniques for Data with Few Labeled Samples*, International Journal of Data Science and Analytics, published online July 1, 2023.
19. Merkurjev, E., *Similarity Graph-based Max-flow and Dual Approaches to Semi-Supervised Data Classification and Image Segmentation*, International Journal of Machine Learning and Cybernetics, published online June 21, 2023.
18. Merkurjev, E., Nguyen, D., Wei, G.-W., *Multiscale Laplacian Learning*, Applied Intelligence, 53(12), pp. 15727–15746, 2023, published online November 28, 2022.
17. Balaji, A., Merkurjev, E., *Similarity Graph-based Semi-Supervised Methods for Multiclass Data Classification*, Journal of Emerging Investigators, Volume 3, 2021, Date of Publication (online): September 2021, with local high school student Ashwin Balaji.

[1] The first two authors usually indicate the lead authors of a paper.

16. Merkurjev, E., *A Graphical Approach for Multiclass Classification and for Correcting the Labeling Errors in Mislabeled Training Data*, Intelligent Data Analysis, 25(4), pp. 879-906, 2021.

15. Merkurjev, E., *A Fast Graph-Based Classification Method Applied to Unsupervised Classification of 3D Point Clouds*, Pattern Recognition Letters, 136, pp. 154-160, 2020.

14. Bertozzi, A.L., Merkurjev, E., *Graph-based Optimization Approaches for Machine Learning, Uncertainty Quantification and Networks*, Handbook of Numerical Analysis: Processing, Analyzing and Learning of Images, Shapes, and Forms: Part 2, vol. XX, pp. 503-532, 2019.

13. Waters, A., Merkurjev, E., *Asymptotics for Optimal Design Problems for the Schrodinger Equation With a Potential*, Journal of Optimization, 2018(3), pp. 1-16, 2018.

12. Jacobs, M., Merkurjev, E., Esedoglu, S., *Auction Dynamics: A Volume Constrained MBO Scheme*, Journal of Computational Physics, 354, pp. 288-310, 2018.

11. Merkurjev, E., Bertozzi, A.L., Chung, F., *A Semi-Supervised Heat Kernel Pagerank MBO Algorithm for Data Classification*, Communications in Mathematical Sciences, 16(5), pp. 1241-1265, 2018.

10. Bae, E. and Merkurjev, E., *Convex Variational Methods on Graphs for Multiclass Segmentation of High-Dimensional Data and Point Clouds*, Journal of Mathematical Imaging and Vision, 58(3), pp. 468-493, 2017.

9. Meng, G., Merkurjev, E., Koniges, A., Bertozzi, A. *Hyperspectral Image Classification Using Graph Clustering Methods*, Image Processing On Line, 7, pp. 218-245, 2017.

8. Merkurjev, E., Bertozzi, A.L., Lerman, K., Yan, X., *Modified Cheeger and Ratio Cut Methods Using the Ginzburg-Landau Functional for Classification of High-Dimensional Data*, Inverse Problems, 33(7), pp. 074003, 2017.

7. Merkurjev, E., Bae, E., Bertozzi, A.L., and Tai, X.-C., *Global Binary Data Optimization on Graphs for Data Segmentation*, Journal of Mathematical Imaging and Vision, 52(3), pp. 414-435, 2015.

6. Merkurjev, E., Sunu, J. and Bertozzi, A.L., *Graph MBO Method for Multiclass Segmentation of Hyperspectral Stand-off Detection Video*, Proceedings of IEEE International Conference on Image Processing, Paris, France, pp. 689-693, October 27-30, 2014.

5. Merkurjev, E., Garcia-Cardona, C., Bertozzi, A.L., Flenner, A. and Percus, A., *Research Announcement: Diffuse Interface Methods for Multiclass Segmentation of High Dimensional Data*, Applied Mathematics Letters, 33, pp. 29-34, 2014.

4. Garcia-Cardona, C., Merkurjev, E., Bertozzi, A.L., Percus, A., Flenner, A., *Multiclass Segmentation Using the Ginzburg-Landau Functional and the MBO Scheme*, IEEE Transactions on Pattern Analysis and Machine Intelligence, 36(8), pp. 1600-1614, 2014.

3. Gerhart, T., Sunu, J., Lieu, L., Merkurjev, E., Chang, J.-M., Gilles, J., Bertozzi, A.L., *Detection and Tracking of Gas Plumes in LWIR Hyperspectral Video Sequence Data*, SPIE Conference on Defense Security and Sensing, 87430J, Baltimore, April 29, 2013.

2. Merkurjev, E., Kostić, T. and Bertozzi, A.L., *MBO Scheme on Graphs for Segmentation and Image Processing*, SIAM Journal on Imaging Sciences, 6(4), pp. 1903-1930, 2013.

1. Peterson, G.E., Campbell, E.T., Balbas, J., Ivy, S., Merkurjev, E., Rodriguez, P., Relative Performance of Lambert Solvers 1: 0-Revolution Methods, Advances in the Astronautical Sciences, 136(1), pp. 1495-1510, presented at 20th AAS/AIAA Space Flight Mechanics Meeting, San Diego, CA, February 14-17, 2010.

Funded Grants

- PI (Principal Investigator): NSF DMS CDS&E-MSS, Co-PI: Guowei Wei
  - Title: Collaborative research: Integrating algebraic topology, graph theory, and multiscale analysis for learning complex and diverse datasets
  - Award Amount: $350,000
  - Dates: 9/2021- 9/2024
- Single PI (Principal Investigator): Simons Foundation Collaboration Grant for Mathematicians (Declined due to award of NSF grant)
  - Title: Design of algorithms for machine learning tasks using graph-based and semi-supervised frameworks
  - Award Amount: $42,000
  - Dates: 9/2021- 8/2026
- Single PI (Principal Investigator): AMS Simons Travel Grant
  - Title: A fusion of graphical and optimization approaches applied to machine learning
  - Award Amount: $4,000
  - Dates: 7/2017- 6/2019
- Single PI (Principal Investigator): AWM-NSF Travel Grant
  - funding to attend the workshop "Numerical Analysis and Approximation Theory meets Data Science" in Banff, Alberta, Canada, 4/22/2018-4/27/2018

Awards

- J. Sutherland Frame Excellence-in-Teaching Award (April 2022)
- UC President's Postdoctoral Fellowship (2015-2016)
- Pacific Journal of Mathematics Dissertation Prize (2015)
- Dissertation Year Fellowship (2014-2015)
- NSF Graduate Fellowship (2011-2014)
- Eugene-Cota Robles Fellowship (2010-2011)
- NSF Research and Training Grant Fellowship in Applied Mathematics (2010-2011)
- Sherwood Award (for excellence in undergraduate studies) (2010)
- Departmental Scholar at UCLA (2009-2010)
- Basil Gordon Prize ($1000) for highest score on the William Lowell Putnam Examination among UCLA students (2008)

Featured Talks

- John H. Barrett Memorial Lectures, University of Tennessee, TN, May 1-3, 2017
- Association for Women in Mathematics Research Symposium, MD, April 11, 2015
- IEEE International Conference on Image Processing, Paris, October 27-30, 2014

Invited Talks/ Conference Presentations/ Posters

- SIAM Conference on Imaging Science, Atlanta, Georgia, May 28 - 31, 2024
- One World Seminar Series on the Mathematics of Machine Learning, July 5th, 2023, via Zoom
- SIAM Conference on Mathematics of Data Science, San Diego, September 26-30, 2022, via Zoom
- ACRES REU research presentation, MSU, June 8, 2022
- Data Science Group Meeting, UCLA (led by Andrea Bertozzi), May 24, 2022, via Zoom
- SIAM Conference on Imaging Science, Berlin, Germany, March 22-25, 2022, via Zoom
- ECRE program for underrepresented minorities, MSU, May 24, 2021, via Zoom
- UC Davis Mathematics of Data and Decisions Seminar, May 18, 2021, via Zoom
- SIAM Conference on Computational Science and Engineering, March 1-5, 2021, via Zoom
- Seminar (Math 285J), UCLA, November 20, 2020, via Zoom
- Theory and Algorithms in Graph-Based Learning Workshop, University of Minnesota, September 14-18, 2020, via Zoom
- SIAM Mathematics of Data Science Conference in Cincinnati, May 5-7, 2020, via Zoom
- Association for Women in Mathematics, MSU Chapter Seminar, October 23, 2018

- Seminar (Arjun Krishnan), Michigan State University, June 18, 2018
- SIAM Conference on Imaging Science, Bologna, Italy, June 5-8, 2018
- Num. Analysis and Approx. Theory meets Data Science, Canada, April 22-27, 2018
- Colloquium, Michigan State University, April 17, 2018
- Topical Seminar for Undergraduate Mathematicians, MSU, February 16, 2018
- Inverse Problems in Machine Learning, Caltech, February 9-11, 2018
- SIAM Conference on Analysis of Partial Differential Equations, December 9-12, 2017
- CMSE Department Seminar, Michigan State University, October 27, 2017
- Invited Speaker, Barrett Memorial Lectures, University of Tennessee, May 1-3, 2017
- Applied Mathematics Seminar, Michigan State University, April 26, 2017
- Applied Mathematics Seminar, University of Michigan, Ann Arbor, March 17, 2017
- SIAM Conference on Comput. Science and Engineer., Atlanta, Feb. 27 - March 3, 2017
- Applied Mathematics Colloquium, University of California, Los Angeles, February 8, 2017
- Applied Mathematics Seminar, Michigan State University, November 10, 2016
- Midwest Optimization Meeting, Michigan State University, October 22, 2016
- Applied Mathematics Seminar, University of California, Los Angeles, April 29, 2016
- Department of Mathematics Seminar, Michigan State University, January 14, 2016
- Joint Mathematics Meeting, Seattle, WA, January 6-9, 2016
- Department of Mathematics Seminar, Syracuse University, NY, December 14, 2015
- Symposium for Women in Mathematics in Southern California (WiMSoCal), Pomona College, CA, November 7, 2015
- Computational Sciences Seminar, San Diego State University, October 30, 2015
- MURI meeting, ISI Institute, Marina del Rey, CA, September 25, 2015
- 13th U.S. National Congress on Computational Mechanics, San Diego, July 27-30, 2015
- ENS Cachan Seminar, Paris, France, July 8, 2015
- Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland, July 3, 2015
- Association for Women in Mathematics Research Symposium, MD, April 11-12, 2015
- IEEE International Conference on Image Processing, Paris, October 27-30, 2014
- Keck Meeting, California NanoSystems Institute, Los Angeles, CA, August 18, 2014
- Algorithms for Threat Detection Workshop, Boulder, CO, March 10-12, 2014
- Fall Western Sectional Meeting (#1095), UCR, Riverside, CA, Nov. 2-3, 2013
- ONR Math Data Science Program Review Meeting, Durham, NC, Sept. 16-19, 2013
- Level Set Seminar, Institute for Pure and Applied Mathematics, CA, August 27, 2013
- Algorithms for Threat Detection Workshop, San Diego, CA, Nov. 26-29, 2012

Conference Organization

- Organizer of a mini-symposium "Graph-based Techniques in Machine Learning"" of the SIAM Great Lakes Section Annual Meeting, MSU, October 14, 2023

Teaching Experience

- Fall 2024: Matrix Algebra I (Math 314), MSU
- Fall 2024: Optimization Methods in Data Science (CMSE 382), MSU
- Spring 2024: Instructor for Capstone Seminar in Mathematics (Math 496), MSU
- Fall 2023: Instructor for Numerical Analysis I (Math 850), MSU, graduate course
- Spring 2023: Matrix Algebra I (Math 314), MSU
- Fall 2022: Optimization Methods in Data Science (CMSE 382), MSU
- Spring 2022: Instructor for Capstone Seminar in Mathematics (Math 496), MSU
- Fall 2021: Instructor for College Algebra I (Math 103A), MSU
- Spring 2021: Instructor for Capstone Seminar in Mathematics (Math 496), MSU

- Fall 2020: Instructor for Introduction to Computational Modeling (CMSE 201), MSU
- Spring 2020: Instructor for Calculus I (Math 132), MSU
- Fall 2019: Instructor for Calculus I (Math 132), MSU
- Fall 2018: Capstone Seminar in Mathematics (Math 496), MSU
- Fall 2018: Instructor for Introduction to Computational Modeling (CMSE 201), MSU
- Spring 2018: Instructor for Introduction to Computational Modeling (CMSE 201), MSU
- Fall 2017: Instructor for Linear Algebra (Math 309), MSU
- Fall 2016: Instructor for Calculus I (Math 132), MSU
- Winter 2016: Instructor for Linear Algebra (Math 20F), UCSD
- Summer 2014: Instructor of 2014 Math GRE Workshop, UCLA
- Winter 2011: Teaching Assistant for Calculus (Math 31B), UCLA

Postdoc Mentoring

- I have worked on a paper with Duc Nguyen, a former postdoctoral scholar of the MSU Math Department under the direction of Prof. Guowei Wei. Dr. Nguyen is now a tenure-track Assistant Professor at University of Kentucky.

Graduate Student Mentoring

- Nicole Hayes - (Fall 2020 - present)
  - I am a PhD advisor of Nicole Hayes (a Ph.D. student in the MSU Mathematics Department), also co-advised by Prof. Guowei Wei. She is studying graph-based topological techniques for applications such as biological data.
- Gokul Bhusal - (Summer 2022 - present)
  - I am a PhD advisor of Gokul Bhusal (a Ph.D. student in the MSU Mathematics Department). He is studying semi-supervised graph-based techniques and deep learning.

Undergrad Student Mentoring

- Bao Hoang (December 2023- present)
  - Bao is an MSU student in the advanced track who is working with me on deep learning techniques.
- Yizhen Wang (September 2023- December 2023)
  - Yizen is an exchange student from SouthEast University in China. I have mentored the student through Zoom meetings on semi-supervised and supervised graph-based techniques for machine learning tasks. The student wrote a report and make a virtual presentation at the end of the program.
- Marco Abat (September 2023- December 2023)
  - Marco is an MSU student who worked with an exchange student from SouthEast University in China and another MSU student. I have mentored the student through Zoom meetings on semi-supervised and supervised graph-based techniques for machine learning tasks. The student wrote a report and make a virtual presentation at the end of the program.
- Aidan Gollan (September 2023- December 2023)
  - Marco is an MSU student who worked with an exchange student from SouthEast University in China and another MSU student. I have mentored the student through Zoom meetings on semi-supervised and supervised graph-based techniques for machine learning tasks. The student wrote a report and make a virtual presentation at the end of the program.
- Xianglin Chen (September 2022- December 2022)
  - Xianglin is an undergraduate exchange student from Jilin University in China. I have mentored the student through Zoom meetings on comparing semi-supervised and supervised graph-based techniques for machine learning tasks. The student wrote a report and make a virtual presentation at the end of the exchange program.
- Bao Hoang (September 2022- December 2022)
  - Bao is an MSU student who worked with two exchange students from Jilin University

in China. I have mentored the student through Zoom meetings on comparing semi-supervised and supervised graph-based techniques for machine learning tasks. The student wrote a report and make a virtual presentation at the end of the program.

- Ziwen Meng (September 2022- December 2022)
  - Yunzhang is an undergraduate exchange student from Jilin University in China. I have mentored the student through Zoom meetings on comparing semi-supervised and supervised graph-based techniques for machine learning tasks. The student wrote a report and make a virtual presentation at the end of the exchange program.
- Alexander Sietsema (August 2021- May 2022)- Independent Study
  - Alexander is an undergraduate at MSU. I am mentoring Alexander (though independent study) in large linear systems in data science.
- Nyssa Gaitor - (May 2021- July 2021)
  - Nyssa is an undergraduate student at a college in the Michigan area and I have mentored her as part of the ECRE program for underrepresented groups. We have met weekly, and she performed computational tasks with different machine learning techniques using Matlab and Python.
- Alexis Braswell - (May 2021- July 2021)
  - Alexis is an undergraduate student at a college in the Michigan area and I have mentored her as part of the ECRE program for underrepresented groups. We have met weekly, and she performed computational tasks with different machine learning techniques using Matlab and Python.
- Yunzhang Hu - (January 2021 - May 2021)
  - Yunzhang is an undergraduate exchange student from Xi'an Jiaotong University. I have mentored the student through Zoom meetings on semi-supervised graph-based techniques for machine learning tasks. The student wrote a report and make a virtual presentation at the end of the exchange program.
- Nicholas Grabill - (January 2021- May 2021)
  - Nicholas is an undergraduate (advanced track math major) at MSU. I have mentored Nicholas on semi-supervised graph-based methods for machine learning tasks as part of the math exchange program at MSU. The student wrote a report and make a virtual presentation at the end of the exchange program. Nicholas attended the REU at Carnegie Mellon University during summer 2021.
- Alexander Sietsema - (January 2021- May 2021)
  - Alexander is an undergraduate at MSU. I have mentored Alexander on semi-supervised graph-based methods for machine learning tasks as part of the math exchange program at MSU. The student wrote a report and make a virtual presentation at the end of the exchange program. Alexander attended the REU at UCLA in summer of 2021.
- Calarina Muslimani - (June 2019 - August 2019)
  - Calarina was an undergraduate student I mentored as part of the 2019 ACRES REU program at Michigan State University. The project consisted of developing methods for classification of hyperspectral data sets.
- Daria Garkavtseva - (June 2019 - August 2019)
  - Daria was an undergraduate student I mentored as part of the 2019 ACRES REU program at Michigan State University. The project consisted of developing methods for classification of hyperspectral data sets.
- Elena Komesu - (April 2018 - May 2019)
  - Elena was an undergraduate at MSU and I have mentored her through the Honors College Professorial Assistantship program. The project consisted of learning about various deep learning techniques for classification and using the Python TensorFlow library. She had written a detailed report at the end of the mentoring experience.

Involvement in Summer or Semester Programs

- Fall 2023: Faculty Mentor for the MSU Exchange Program with China (SouthEast University)
  - Project: Semi-supervised and supervised machine learning techniques for data classification
  - Mentor for Yizhen Wang, Marco Abat and Aidan Gollan
- Summer 2023: Virtually advised team led by Yifei Lou and Cristina Garcia-Cardona during the Research Collaboration Workshop, "Women in Data Science and Mathematics" (August 7 - 11, 2023)
  - Project: Feature learning and optimization techniques for machine learning tasks
- Fall 2022: Faculty Mentor for the MSU Exchange Program with China (Jilin University)
  - Project: Comparison of Machine Learning Methods
  - Mentor for Xianglin Chen, Bao Hoang and Ziwen Meng
- Summer 2021: Faculty Mentor for ECRE program
  - Project: Comparing Machine Learning Methods
  - ECRE program at MSU is an opportunity for undergraduates from *underrepresented minority groups* to engage in a 10-week part-time computing research project.
  - Mentor for Nyssa Gaitor and Alexis Braswell
- Spring 2021: Faculty Mentor for the MSU Exchange Program with China (Jiaotong University)
  - Project: Semi-Supervised and Supervised Learning Methods
  - Mentor for Alexander Sietsema, Nicholas Grabill and Yunzhang Hu
- Summer 2019: Faculty Mentor for the 2019 ACRES program, MSU
  - Project: Data Classification and Image Segmentation
  - Mentor for Calarina Muslimani and Daria Garkavtseva
- Fall 2018, Spring 2019: Honors College Professorial Assistantship program
  - Project: Machine Learning and TensorFlow
  - Mentor for Elena Komesu
- Summer 2014: Mentor for RIPS program, Institute for Pure and Applied Mathematics
  - Project: Google LA- Text Classification
  - Mentor for Simona Boyadzhiyska, Wei Qian, Laura Asaro and Lorena Maxwell
- Summer 2012: Mentor for Applied Mathematics REU, UCLA
  - Project: Hyperspectral Image Segmentation
  - Mentor for Torin Gerhart, Justin Sunu and Lauren Lieu

Open Source Code and Software

Open source code and software is available at:

- my webpage at `http://users.math.msu.edu/users/kmerkurev/index.htm`
- my Github account `https://github.com/kmerkurev`
- IPOL webpage `https://doi.org/10.5201/ipol.2017.204`

Outreach

- Mentor of high school student Veena Sundararajan (March 2023- present)
  - Veena is a sophomore high school student in Tennessee, and I was mentoring her on machine learning and deep learning techniques.
- Mentor of high school student Ashwin Balaji (June 2020 - August 2021)
  - Ashwin is a senior in Novi High School in Michigan, and I was mentoring him on machine learning techniques. His research work with me was accepted at the NCUR and Sigma Xi conferences and published at the Journal of Emerging Investigators.
- Presenter at the MSU Science Festival (Spring 2024 and Spring 2021)
  - The presentation I gave in Spring 2024 and Spring 2021 was titled "AI School: An Introduction to Machine Learning", and it was an introduction to fundamental concepts of machine learning. I also helped organize the event "Kids Verses Machine Learning" at the MSU Science Festival in 2024. The event involved machine learning activities

for children, such as using machine learning computational resources to identify handwritten digits.

- Involvement in Academic Consulting
  - I am one of the leaders in the Machine Learning Consultancy (MLC), founded by Guowei Wei, at MSU. MLC integrates MSU's expertise in machine learning and provides free consulting services on machine learning techniques related to research at MSU. In particular, this consultancy offers advice on how to properly collect and organize data, and how to analyze and identify the most important features in data.
- Member of Math Alliance
  - Math Alliance is an organization seeking to increase the number of PhDs awarded in mathematics among underrepresented minorities.

Enhancement of Curricula

- Development of new course Math 483 on machine learning to be offered every Spring semester. This course will focus on mathematical theory and theoretical performance guarantees of the covered machine learning methods.
- Development of complete curriculum for Math 496: Capstone Seminar on Machine Learning taught in Fall 2018, Spring 2021 and Spring 2022. The course covers fundamental aspects of machine learning and deep learning, including k-nearest neighbors, support vector machines, neural networks, decision trees, random forests, regression, clustering, dimension reduction, density estimation, anomaly detection, etc. The second part of the course will provide an introduction to deep learning, convolutional neural networks, recurrent neural networks, autoencoders, generative adversarial networks, and more.

Department Service

- Undergrad Studies Committee, Mathematics Department (2023-2024 Academic Year)
- Modernizing the Computational Math BA/BS Committee (2022-2023 Academic Year)
- Frame Teaching Award Committee (2022-2023 Academic Year)
- Awards Committee, Department of CMSE (2022-2023, 2023-2024 Academic Years)
- NatSci representative to the University Committee on Faculty Affairs (2022-2023, 2023-2024 Academic Years)
- Graduate Studies Committee, Mathematics Department (2021-2022, 2022-2023 Academic Years)
- Seminar/Colloquiua Committee at the CMSE department (2021-2022, 2020-2021, 2019-2020 Academic Years)
- Organizer of the MSU Applied Mathematics Seminar (2018-2019 Academic Year)
- Member of the Faculty Search Committee for Joint Appointment Faculty Member: BAE and CEE departments (2019-2020 Academic Year)
- Learning Technology Committee (2018-2019 Academic Year)
- Dissertation committee of:
  - David Esteban Munoz Ramirez - Advisor: Liz Munch (2024)
  - Ben Jones - Advisor: Guowei Wei (2023)
  - Mushal Zia - Advisor: Guowei Wei (2023)
  - Faisal Abdulaziz Suwayyid - Advisor: Guowei Wei (2023)
  - Bowen Su - Advisor: Andrew Christlieb (2023)
  - Marcus Djokic - Advisor: Jose Mendoza Cortes (2023)
  - Gengzhuo Liu - Advisor: Guowei Wei (2023)
  - Li Shen - Advisor: Guowei Wei (2023)
  - Gokul Bhusal - Advisor: Ekaterina Rapinchuk (2023)
  - Nicole Hayes - Advisor: Ekaterina Rapinchuk and Guowei Wei (2021)
  - Daniel Griffin- Advisor: Kevin Ford (2022)

- Eric Flynn- Advisor: Witek Nazarewicz (2021)
- Liping Yin - Advisor: Matthew Hirn (2021)
- Albert Chua - Advisor: Matthew Hirn (2021)
- Yuta Hozumi - Advisor: Guowei Wei. (2021)
- Azzam Alfarraj - Advisor: Guowei Wei. (2021)
- Xiaoqi Wei - Advisor: Guowei Wei (2021)
- Christopher Grow- Advisor: Guowei Wei (2021)
- Mark Roach - Advisor: Mark Iwen (2020)
- Nazanin Donyapour - Advisor: Alex Dickson. (2020)
- Leo Li - Advisor: Ming Yan. (2020)

Other Contributions/ Activities

- NSF Reviewer and Ad Hoc Reviewer
- on the Editorial Board of Cambridge Element series on "The Mathematics of Large-Scale Data Interactions" (since 2021).
- Reviewer for:
  - IEEE Transactions on Image Processing
  - Applied Mathematical Modelling
  - Pattern Recognition
  - SIAM Journal on Imaging Sciences
  - SIAM Journal on Scientific Computing
  - SIAM Journal on Applied Mathematics
  - SIAM Journal on Mathematical Analysis
  - Expert Systems With Applications
  - Remote Sensing
  - Signal Processing
  - Applied Intelligence
  - Journal of Mathematical Imaging and Vision
  - Communications in Mathematical Sciences
  - Applied Network Science
  - Sampling Theory and Applications
  - Electronics
  - BMC Supplements
  - Symmetry
  - Scholarship and Practice of Undergraduate Research (SPUR)

Industry Experience

Image Scientist, GumGum — March 2015- June 2015

- implemented image classification algorithms in C++
- improved image recognition models

References Available to Contact

References available upon request.