Gokul Bhusal

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Education

Michigan State University — *East Lansing, MI*
Doctoral candidate in Applied Mathematics — *August 2020 - May 2026 (Expected)*
Thesis Advisor: Dr. Ekaterina Merkurjev

The University of Southern Mississippi — *Hattiesburg, MS*
B.S. Mathematics & Minor in Computer Science, Magna cum laude — *August 2016 - May 2020*
Advisor: Dr. Zhifu Xie

Research Interests

Graph based method, Active learning, Optimization, Image processing.

Publications

- Hyperspectral Image Unmixing with Endmember Bundles and Different Sparsity Promoting Functions, with Ekaterina Merkurjev (MSU), Cristina Garcia-Cardona (Los Alamos), and Yifei Lou (UNC) (In preparation).
- **Gokul Bhusal**, Kevin Miller, Ekaterina Merkurjev, MALADY: Multiclass Active Learning with Auction Dynamics on Graphs (Submitted).
- **Gokul Bhusal**, Ekaterina Merkurjev, Guo-Wei Wei, Persistent Laplacian-enhanced Algorithm for Scarcely Labeled Data Classification, *Machine Learning (2024).*
- Zhifu Xie, **Gokul Bhusal**, Hamas Tahir, Central Configurations in the Planar 6-body Problem Forming Two Equilateral Triangles, *Journal of Geometry and Physics.*

Honors and Awards

2024	Outstanding Scholar Fellowship - College of Natural Science, MSU ($7,500)
2024	TA Award for Excellence in Teaching - Department of Mathematics at MSU
2024	Herbert T.Graham Scholarship - MSU-Math ($2,125)
2023	Outstanding Scholar Fellowship - College of Natural Science, MSU ($7,500)
2020	Early Start Fellowship - College of Natural Science, MSU. ($6,000)
2018	Placed 2nd in Louisiana/Mississippi region's Mathematical Association of American Competition for research paper competition.
2018	Received travel grant to present poster presentation in JMM 2018 ($500)
2018	Nominated for the College of Science and Technology's Outstanding Sophomore Award, USM

Invited Talks/Conference Presentations/Posters

- Student Applied Mathematics Seminar, Michigan State University, Nov 2024 (talk)
- 2024 SIAM Student Mini-Symposium in Applied Mathematics, University of Michigan, Sep 15 (talk)
- SIAM Great Lakes Meeting, Michigan State University, Oct 14, 2023 (talk).
- LA/MS Mathematical Associations of America, Loyola University New Orleans, February 2020 (Oral Presentation)

- USA/USM/SELU Math and Physics Research Mini-Conference, Gulf Park, MS, April 2019 (Oral Presentation)
- Joint Mathematics Meeting San Diego, CA, January 2018 (Poster Presentation)
- Undergraduate Symposium on Research and Creative Activity, Hattiesburg, MS, March 2018 (Poster Presentation)

Conference/Seminar Organization

- Co-organizer (with Edem Boahen) of Student Applied Mathematics seminar, MSU, Fall 2023 - present.

Teaching Experience

- Summer 2024: Teaching Assistant for Matrix Algebra with Computational Applications (Math 314), MSU
- Spring 2024: Teaching Assistant for Numerical methods for ODE (Math 852), MSU
  - Qualifying exam course. Hosted weekly qual-prep recitations.
- Fall 2023: Teaching Assistant for Numerical Analysis I (Math 850), MSU
  - Qualifying exam course. Hosted weekly qual-prep recitations.
- Spring 2023: Teaching Assistant for Matrix Algebra with Computational Applications (Math 314), MSU
- Fall 2022: Recitation Instructor for Calculus II (Math 133), MSU
- Summer 2022: Instructor of record for Calculus I (Math 132), MSU
- Spring 2022: Recitation Instructor for Calculus II (Math 133), MSU
- Fall 2021: Recitation Instructor for Calculus II (Math 133), MSU
- Summer 2021: Recitation Instructor for Calculus II (Math 133), MSU

Outreach

- Outreach Volunteer, Marble Elementary School Math Night, November 16, 2023.
- Served as an instructor in the TRIO SSS program (Summer 2023).
- Served as an instructor in the TRIO SSS program (Summer 2022).

Summer school and Workshop attended

- Optimal Transport Through the Midwest summer school, University of Wisconsin Madison, July 15 - July 19, 2024
- Winter School in Machine Learning 2024, UT-Austin January 15-19, 2024
  - Mathematics of adversarial machine learning
  - Tensor Methods in Data Science
- Research Experience for Undergraduate (REU) 2019 June 03 - July 19
  School of Mathematics and Natural Sciences, The University of Southern Mississippi, Hattiesburg, MS
  Topic: Allee Effects in a Predator-prey Model with Holling type-IV functional Response.

- Research Experience for Undergraduate (REU) 2017 June 19 - August 4
  School of Mathematics and Natural Sciences, The University of Southern Mississippi, Hattiesburg, MS
  Topic: Stacked Central Configuration for 6-body Problem.

Relevent Skills

Proficiency	MATLAB, HPCC Environments, C++, Python, LaTeX.
Familiarity	Maple.

Services and Professional Organization

- **Representative of Math department**, Council of Graduate Students (COGS), Fall 2024–Spring 2025
- **Secretary**, American Math Society, MSU chapter, Fall 2023–Spring 2024
- **Treasurer**, Nepali student Association, Summer 2021–Fall 2022
- **Member**, AMS, Fall 2020 – Present.
- **Member**, SIAM, Fall 2016 – Present.
- **Treasurer** Kappa Mu Epsilon, Fall 2018– Spring 2020

Selected Graduate Coursewrork

- Measure theory
- Complex analysis
- Numerical linear algebra
- Numerical methods for ODE
- Introduction to PDE (two semesters)
- Mathematics of Data Science
- Topological Data Analysis
- Machine Learning
- Graph Theory
- Deep Learning
- High Dimensional Probability
- Computational Optimization
- Harmonic Analysis
- Sublinear-Time Algorithms and SFTs (Hot Topic Short Course)
- Hamilton–Jacobi Equation
- Numerical methods for Optimal Transport (Hot Topic Short Course)