

Gokul Bhusal

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Education

Michigan State University

Doctoral candidate in Applied Mathematics

Thesis Advisor: Dr. Ekaterina Merkurjev

East Lansing, MI

August 2020 - May 2026 (Expected)

The University of Southern Mississippi

B.S. Mathematics & Minor in Computer Science, Magna cum laude

Advisor: Dr. Zhifu Xie

Hattiesburg, MS

August 2016 - May 2020

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*.

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

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 the Louisiana/Mississippi region's Mathematical Association of America Research Paper Competition.
2018	Received travel grant for poster presentation at JMM 2018 (\$500)
2018	Nominated for the College of Science and Technology's Outstanding Sophomore Award, USM

Invited Talks/Conference Presentations/Posters

- SIAM Conference on Mathematics of Data Science (MDS24), Atlanta, October 21–25 , 2024 (Poster Presentation)
- 2024 SIAM Student Mini-Symposium in Applied Mathematics, University of Michigan, Sep 15 (talk)
- 88th Midwest PDE Seminar, The Ohio State University, April 26-28, 2024
- 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)
- Undergraduate Symposium on Research and Creative Activity, Hattiesburg, MS, March 2018 (Poster Presentation)
- Joint Mathematics Meeting San Diego, CA, January 2018 (Poster Presentation)

Conference/Seminar Organization

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

Outreach

- Outreach Volunteer, student poster presentation judge at 2024 AGEPS Student Success Conference, MSU, Oct 4, 2024.
- Outreach Volunteer, Marble Elementary School Math Night, November 16, 2023.
- Served as an instructor in the TRIO SSS program (Summer 2022, Summer 2023).

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.

Relevant Skills

Proficiency	MATLAB, HPCC Environments, C++, Python, L ^A T _E X.
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 Coursework

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| <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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) |
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