

Minah Oh

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James Madison University <http://minahoh.github.io>
Harrisonburg, VA 22807

CITIZENSHIP United States Citizen

EDUCATION Ph.D in Mathematics, University of Florida, Gainesville, FL 05/2010
Dissertation Title: Efficient Solution Techniques for Axisymmetric Problems
Advisor: Dr. Jay Gopalakrishnan
MS in Mathematics, University of Florida, Gainesville, FL 05/2007
BS in Mathematics, Yonsei University, Seoul, Korea 08/2005
Exchange Student, St. Olaf College, Northfield, MN 2003 – 2004

POSITIONS Professor, Department of Mathematics and Statistics 08/2022–present
James Madison University, Harrisonburg, VA
Associate Professor, Department of Mathematics and Statistics 08/2016–present
James Madison University, Harrisonburg, VA
Assistant Professor, Department of Mathematics and Statistics 08/2010–05/2016
James Madison University, Harrisonburg, VA
Graduate Teaching Assistant, University of Florida, Gainesville, FL 08/2005–05/2010
Intern, Citigroup, Sales and Trading in EM Markets, Seoul, Korea 2005
Intern, Tong Yang Venture Capital, Seoul, Korea 2003

NEW PROFESSIONAL SERVICES AND RECENT AWARDS Mathematical Association of America (MAA)
Congress Representative of the Maryland-DC-Virginia Section 2026–2030
2025 MAA Meritorious Service Award Aug. 2025

RESEARCH INTERESTS Numerical Partial Differential Equations: Finite Element Methods and Finite Element Exterior Calculus, Efficient Solution Techniques for Axisymmetric Problems and its Applications, Optimal Control Problems

Numerical Linear Algebra: Low-Rank Approximation of Matrices and its Applications in Data Science

PUBLICATIONS

- Oh, Minah (with Ma and Wang): “P1 Finite Element Methods for a Weighted Elliptic State-Constrained Optimal Control Problem,” Numerical Algorithms, Volume 87 (2021), pp. 1–17.
<https://doi.org/10.1007/s11075-020-00955-0>
- Oh, Minah: “The Hodge Laplacian on Axisymmetric Domains and its Discretization,” IMA Journal of Numerical Analysis. Volume 41 (2020), pp. 1569–1607.
<https://doi.org/10.1093/imanum/draa048>
- Oh, Minah: “Multigrid in $H(\text{div})$ on Axisymmetric Domains,” Journal of Mathematical Analysis and Applications, Volume 490, Issue 1 (2020).

<https://doi.org/10.1016/j.jmaa.2020.124209>

- Oh, Minah (with Brenner and Sung): “P1 Finite Element Methods for an Elliptic State-Constrained Optimal Control Problem with Neumann Boundary Conditions,” *Results in Applied Mathematics*, Volume 8 (2020).
<https://doi.org/10.1016/j.rinam.2019.100090>
- Oh, Minah (with Brenner, Pollock, Porwal, Schedensack, and Sharma): “A C0 Interior Penalty Method for Elliptic Optimal Control Problems with Pointwise State Constraints in Three-Dimensions,” *The IMA Volumes in Mathematics and its Applications*, Volume 160 (2016), pp. 1-22.
<https://doi.org/10.1007/978-1-4939-6399-7>
- Oh, Minah: “De Rham Complexes arising from Fourier Finite Element Methods in Axisymmetric Domains,” *Computers and Mathematics with Applications* 70 (2015), pp. 2063-2073.
<https://doi.org/10.1016/j.camwa.2015.08.020>
- Oh, Minah: “Introducing Proofs to Calculus Students,” *MAA Notes Series “Beyond Lecture: Techniques to Improve Student Proof-Writing Across the Curriculum,”* 2015.
- Bittner, Stephanie, Guo, Xuyi, and Zweber, Adam (advisors: Ducey, Joshua and Oh, Minah): “Integer Invariants of an Incidence Matrix related to Rota’s Basis Conjecture,” *Missouri Journal of Mathematical Sciences* 29(1), 2013.
<https://doi.org/10.35834/mjms/1488423699>
- Oh, Minah: “A New Approach to the Analysis of Axisymmetric Problems,” *IMA Journal of Numerical Analysis* (2014) 34 (4): 1686-1700.
<https://doi.org/10.1093/imanum/drt054>
- Oh, Minah (with Gopalakrishnan): “Commuting Smoothed Projectors in Weighted Norms with an Application to Axisymmetric Maxwell Equations,” *Journal of Scientific Computing*, Vol. 51, pp. 394-420, 2012.
<https://doi.org/10.1007/s10915-011-9513-3>
- Oh, Minah (with Copeland and Gopalakrishnan): “Multigrid in a Weighted Space arising from Axisymmetric Electromagnetics,” *Mathematics of Computation*, Vol. 79, pp. 2033-2058, 2010.
<https://doi.org/10.1090/S0025-5718-2010-02384-1>
- Oh, Minah: “Efficient Solution Techniques for Axisymmetric Problems,” Ph.D. Dissertation, 2010. <http://purl.fcla.edu/fcla/etd/UFE0041576>
- Chen, Kong, Oh, Sanan, and Wang (Mentor: Brendt Wohlberg): “Visual Words, Text Analysis Concepts for Computer Vision,” *IMA Mathematical Modeling in Industry XIII* report, 2009.
- Stock, Nicole (advisor: Oh, Minah): “Higher Order Fourier Finite Element Methods for Hodge Laplacian Problems on Axisymmetric Domains”, *SIAM Undergraduate Research Online*, Vol. 14 (2021)
<https://doi.org/10.1137/21S1416813>
- Keegan, Katherine, Melendez, David, Zheng, Jennifer (advisor: Oh, Minah): “A Modified Watermarking Scheme Based on the Singular Value Decomposition”, *SIAM Undergraduate Research Online*, Vol. 14 (2021) <https://doi.org/10.1137/21S1411664>

RESEARCH GRANTS

National Science Foundation, grant number DMS-1913050, 07/01/2019–06/30/2023,
“RUI: Efficient Numerical Methods for Axisymmetric Problems”, \$100,000 Awarded.
More information about my NSF-funded project can be found [here](#).

JMU College of Science and Mathematics Summer Research Grant \$4000, 2015

JMU College of Science and Mathematics Summer Research Grant \$4000, 2011

UNDERGRADUATE RESEARCH STUDENTS

Andre Mas, JMU

Project Title: Fourier Finite Element Methods for Elliptic State Constrained Optimal
Control Problems on Axisymmetric Domains with General Data 2022–2023

★ Presentation First Prize, MAA MD-DC-VA Section Meeting, spring 2023

Faculty Advisor for summer@ICERM2020 Fast Learning Algorithms for Numerical
Computation and Data Analysis, Brown University summer 2020
<https://icerm.brown.edu/summerug/2020/>.

1. Katherine Keegan, David Melendez, and Jennifer Zheng

Project Title: Randomized Singular Value Decomposition and its Applications

Final Report:

https://icerm.brown.edu/summerug/2020/studentprojects/Randomized_SVD_final_report.pdf

★ Publications in SIAM Undergraduate Research Online and SIAM Review

2. Trevor Crupi, Yonah Moise, and Hannah Odom Project Title: Multigrid for Fourier
Finite Element Methods on Axisymmetric Domains

Final Report:

https://icerm.brown.edu/summerug/2020/studentprojects/IterativeMethods_FinalReport.pdf

Nicole Stock, JMU

Honors Thesis Title: Higher Order Finite Element Methods for Axisymmetric Hodge
Laplacian Problems 2020–2021

★ Poster Presentation First Prize, MAA MD-DC-VA Section Meeting, spring 2021

★ Publication in SIAM Undergraduate Research Online

Grant Henderson, Jacob Spangler, JMU

Project Title: Fourier-FEMs for Elliptic State-Constrained Optimal Control Problems
on Axisymmetric Domains spring 2020

Final Report:

https://drive.google.com/file/d/1cXe8zaKmYG6tMYRsu7d-ouGPn0R3H_gT/view?usp=sharing

Brendan Armani, Andrew Levy, and Andrew Tomassone, JMU

spring 2018

Project Title: Analysis of the Singular Value Decomposition Applied to Image Compression

★ Student Presentation Second Prize, MAA MD-DC-VA Section Meeting, spring 2018

Sophia Mancini and Unyoung Park, JMU Independent Studies spring 2017
 Project Title: The Singular Value Decomposition and its Applications
 ★ Poster Presentation First Prize, MAA MD-DC-VA Section Meeting, spring 2017

Ben Rhodes, JMU Independent Studies spring 2017 – spring 2018
 Project Title: Numerical Methods for Axisymmetric Problems and Dealii

Charles Crook, JMU Internal REU summer 2013
 Project Title: Finite Element Methods for the Poisson Equation and its Applications

Justin Hall, JMU Internal REU summer 2013
 Project Title: Finite Element Methods for the Axisymmetric Maxwell Equations

Jacob Rhodes, JMU Independent Studies 2012–2013
 Project Title: Finite Element Methods and 3D Printing

NSF REU (Co-mentored with Josh Ducey of JMU) summer 2012
 Students: Stephanie Bittner, Michael Cheung, Xuyi Guo, and Adam Zweber
 Project Title: Approaches to Rota's Basis Conjecture

COURSES TAUGHT

Numerical Partial Differential Equations
 Numerical Linear Algebra
 Partial Differential Equations and Fourier Series
 Computers and Numerical Algorithms
 Methods of Applied Calculus
 Linear Algebra with Differential Equations
 Calculus 1, 2, and 3
 Business Calculus
 Nature of Mathematics
 Precalculus: Algebra and Trigonometry

PRESENTATIONS

- Invited Colloquium and Seminar Talks

Colloquium, Salisbury University, Virtual Colloquium,	Apr. 2021
Colloquium, Colorado School of Mines, Virtual Colloquium,	Oct. 2020
Colloquium, University of North Florida, Jacksonville, FL	Feb. 2019
Colloquium, St. Olaf College, Northfield, MN	Oct. 2018
Numerical Analysis Seminar, Louisiana State University	Oct. 2018
Numerical Analysis Seminar, Mississippi State University	Sep. 2018
Colloquium, University of Mary Washington	Apr. 2016
Applied & Computational Mathematics Seminar	
Portland State University, Portland, OR	Apr. 2016
Colloquium, Longwood University, Farmville, VA	Sep. 2013
Numerical Analysis Seminar, Virginia Tech, Blacksburg, VA	Nov. 2011
Colloquium, Colgate University, Hamilton, NY	Feb. 2010
Colloquium, University of North Carolina at Asheville	Feb. 2010
Colloquium, Clarkson University, Potsdam, NY	Feb. 2010
Colloquium, James Madison University, Harrisonburg, VA	Jan. 2010

- Conference Presentations

- Research Presentations

AWM Research Symposium, University of Wisconsin-Madison Quad-Curl Problems on Axisymmetric Domains	May 2025
AMS Spring Southeastern Sectional Meeting, Georgia Institute of Technology, Special Session on Recent Development in Advanced Numerical Methods for Partial Differential Equations Multigrid for Axisymmetric $H(\text{curl})$ -Problems and its Applications	Mar. 2023
Finite Element Circus, Carnegie Mellon University Multigrid for Axisymmetric $H(\text{curl})$ -Problems	Oct. 2022
Afternoon Invited Address Fall 2021 MAA MD-DC-VA Sectional Meeting Amazing Applications of Linear Algebra	Nov. 2021
50th Anniversary of the Finite Element Circus P1 Finite Element Methods for a Weighted Elliptic State-Constrained Optimal Control Problem	Nov. 2020
AMS Fall Central Sectional Meeting, Special Session on Recent Advances in Sci- entific Computing and Applications Multigrid in $H(\text{div})$ on Axisymmetric Domains	Sep. 2020
16th Copper Mountain Conference On Iterative Methods, Multigrid in $H(\text{div})$ on Axisymmetric Domains (Canceled due to COVID-19.)	Mar. 2020
Joint Mathematics Meeting, Denver, CO P1 Finite Element Methods for Elliptic Optimal Control Problems	Jan. 2020
Finite Element Circus, Virginia Tech. Elliptic State-Constrained Optimal Control Problems with Neumann Boundary Conditions	Nov. 2019
MAA MD-DC-VA Section Meeting, Hood College & Frederick County Community College Using Mathematics to Solve Real-World Problems	Apr. 2019
Joint Mathematics Meeting, Baltimore, MD The Hodge Laplacian on Axisymmetric Domains	Jan. 2019
Finite Element Circus, University of Delaware The Hodge Laplacian on Axisymmetric Domains	Nov. 2018
MAA MD-DC-VA Sectional Meeting, CNU Grad, Curl, and Div on Axisymmetric Domains	Nov. 2017
Cascade RAIN Meeting, Washington State University Tools to Analyze Axisymmetric Problems	Apr. 2016
Finite Element Circus, George Mason University De Rham Complexes arising from Fourier-FEMs in Axisymmetric Domains	Mar. 2015
Finite Element Circus/Rodeo, Louisiana State University A New Approach to the Analysis of Axisymmetric Problems	Mar. 2013
2013 Joint Mathematics Meeting, San Diego, CA A New Approach to the Analysis of Axisymmetric Problems	Jan. 2013
2011 Joint Mathematics Meeting, New Orleans, LA	Jan. 2011

Commuting Smoothed Projections in Weighted Spaces

Finite Element Circus, IMA, Minneapolis, MN Nov. 2010
Commuting Smoothed Projections in Weighted Spaces

Finite Element Circus, University of Delaware, Newark, DE Apr. 2009
Multigrid in a Weighted Spaces arising from Axisymmetric Electromagnetics

33rd SIAM Southeastern-Atlantic Section Conference Apr. 2009
University of South Carolina
Recent Advances in Computational Electromagnetics

– Presentations related to Undergraduate Education

2026 MathFest, Boston, MA Aug. 2026
Spreading the Love of Mathematics

MAA MD-DC-VA Section Meeting, Frederick, MD Apr. 2026
Spreading the Love of Mathematics

Joint Mathematics Meeting, Denver, CO Jan. 2020
How Exposure to Research in Numerical PDEs Influenced Students In My PDE Class

Joint Mathematics Meeting , Baltimore, MD Jan. 2019
Teaching Linear Algebra through its Applications

MAA MD-DC-VA Section Meeting, UMW Nov. 2018
The Value of Solid Mathematics for Computer Algorithms

MAA MD-DC-VA Sectional Meeting, Johns Hopkins University Nov. 2016
Effective In-Class Programming Projects for STEM Majors

JMU Kappa Delta Pi's Annual Educators' Conference Feb. 2016
Making a Difference with Teaching

MAA MD-DC-VA Sectional Meeting, Roanoke College Mar. 2015
Finite Element Methods and Undergraduate Research

MAA MD-DC-VA Section Meeting, Harrisonburg, VA Apr. 2014
Introducing Proofs to Calculus Students

2013 Joint Mathematics Meeting, San Diego, CA Jan. 2013
An Applied Project for Linear Algebra Students: Finite Element Methods

MAA MD-DC-VA Section Meeting, Newport News, VA Nov. 2011
An Applied Project for Linear Algebra Students

2011 Joint Mathematics Meeting, New Orleans, LA Jan. 2011
Introducing Proofs to Calculus Students

RESEARCH STUDENTS PRESENTATIONS AND AWARDS

Nicole Stock: MAA MD-DC-VA Section Meeting (Virtual) Apr. 2021
★ Award: Poster Presentation First Prize

Trevor Crupi, Yonah Moise, and Hannah Odom
JMU SUMS (Virtual) Dec. 2020

	SIAM Annual Meeting	Jul. 2021
	Katherine Keegan, David Melendez, and Jennifer Zheng	
	JMU SUMS (Virtual)	Dec. 2020
	SIAM Annual Meeting	Jul. 2021
	Brendan Armani, Andrew Levy, and Andrew Tomassone	
	MAA MD-DC-VA Section Meeting	Apr. 2018
	★ Award: Student Presentation Second Prize	
	Ben Rhodes: MAA MD-DC-VA Section Meeting	Apr. 2018
	Sophia Mancini and Unyoung Park: MAA MD-DC-VA Section Meeting	Apr. 2017
	★ Award: Poster Presentation First Prize	
	Charles Crook: JMU SUMS	Oct. 2013
	Justin Hall, JMU SUMS	Oct. 2013
	Adam Zweber, Joint Mathematics Meeting	Jan. 2013
WORKSHOPS	(Invited) Mathematisches Forschungsinstitut Oberwolfach Workshop	Jun. 2022
	Hilbert Complexes: Analysis, Applications, and Discretizations	
	Oberwolfach, Germany. (Institute offering board and lodging.)	
	Workshop at East Coast Optimization Meeting (ECOM) 2021	Apr. 2021
	Optimization for Machine Learning	
	Virtual Conference	
	Workshop at CM2021: 20th Copper Mountain Conference on Multigrid Methods	Mar. 2021
	Algebraic Multigrid and Advanced Topics, Parallel Multigrid	
	Virtual Conference	
	ICERM Semester Workshop	Jun. 2018
	Computational Aspects of Time Dependent Electromagnetic Wave Problems in Complex Materials	
	ICERM, Providence, RI. (Attended with full travel support by organizers.)	
	ICERM Semester Workshop	Oct. 2017
	Mathematical and Computational Aspects of Radar Imaging	
	ICERM, Providence, RI.	
	IMA Special Workshop	Mar. 2015
	WhAM! A Research Collaboration Workshop for Women in Applied Mathematics: Numerical	
	Partial Differential Equations and Scientific Computing	
	Louisiana State University. (Attended with full travel support by organizers.)	
	IMA Special Workshop	Oct. 2014
	Structure-Preserving Discretizations of Partial Differential Equations	
	IMA, Minneapolis, MN. (Attended with full travel support by organizers.)	
	IMA Special Workshop	Aug. 2014
	WhAM! A Research Collaboration Workshop for Women in Applied Mathematics: Numerical	
	Partial Differential Equations and Scientific Computing	

IMA, Minneapolis, MN. (Attended with full travel support by organizers.)	
NSF/CBMS Conference Finite Element Exterior Calculus (FEEC) ICERM, Providence, RI. (Attended with full travel support by organizers.)	Jun. 2012
IMA Annual Program Year Workshop Large-scale Inverse Problems and Quantification of Uncertainty IMA, Minneapolis, MN.	Jun. 2011
IMA Annual Program Year Workshop Numerical Solutions of Partial Differential Equations: Fast Solution Techniques IMA, Minneapolis, MN. (Attended with full travel support by organizers.)	Nov. 2010
IMA Math Modeling Mathematical modeling in industry XIII A Workshop for Graduate Students IMA, Minneapolis, MN. (Attended with full travel support by organizers.)	Aug. 2009

HONORS AND AWARDS

Meritorious Service Award, Mathematical Association of America Christensen Service Award, MAA MD-DC-VA Section	Aug. 2025 Sister Helen Fall 2022
Section Project NExT	2010–2012
Graduate Teaching Award, University of Florida 20 awards given among several thousands of Teaching Assistants in the university.	Mar. 2007
Departmental Teaching Award Department of Mathematics, University of Florida	Mar. 2007
SIAM Student Chapter Certificate of Recognition The SIAM Education Committee	May 2008

PROFESSIONAL ASSOCIATION

Mathematical Association of America (MAA)
American Mathematical Society (AMS)
Society for Industrial and Applied Mathematics (SIAM)
Association for Women in Mathematics (AWM)

PROFESSIONAL SERVICE

• Professional Societies or Grant Agencies	
MAA Congress Representative for the MD-DC-VA Section	2026–2030
Past Chair, MD-DC-VA Section of the MAA	2021–2022
Chair, MD-DC-VA Section of the MAA	2019–2021
Program Chair, MD-DC-VA Section of the MAA	2016–2018
NSF panelist	2019, 2020, 2022, 2025
Conference Organizer, MAA MD-DC-VA Virtual Sectional Meeting	Apr. 2021
Conference Organizer, MAA MD-DC-VA Virtual Sectional Meeting	Nov. 2020

Project NExT Consultant	2020–present
MAA Tensor Women and Mathematics Grant Panelist	2015 and 2017–2019
MAA Committee on the Participation of Women (CPW)	2018–2024
Chair Elect, MD-DC-VA Section of the MAA	2018–2019
MAA MD-DC-VA Section’s Liaison with the AWM	2016–present
At Large Member MD-DC-VA MAA Section Meeting	2013–2015
Paper Referee SIAM Journal on Numerical Analysis (SINUM), Computers and Mathematics with Applications (CAMWA), Journal of Scientific Computing (JSC), Journal of Computational Physics (JCP), Results in Applied Mathematics (RINAM), and Computer Methods in Applied Mechanics and Engineering (CMAME)	2011–present

Regular Undergraduate Student Poster and Paper Judge at Professional Meetings

- **Department, College, and University**

Academic Program Review Committee	Aug. 2024–present
Chair of the Applied Math Committee	Aug. 2021–May 2024
Personnel Advisory Committee	Aug. 2019–May 2021
Member of JMU Asian Pacific Islander Desi Americans (APIDA) Caucus	Sep. 2021–present
JMU AWM Student Chapter Faculty Advisor	2012–2013, 2016–present
Established the JMU AWM Student Chapter.	Dec. 2011
Applied Math Committee	fall 2010–present
Student Activities Committee	fall 2014–present
Academic Advisor for Math Majors	fall 2011–present
Academic Program Review Committee	spring 2015–spring 2016
Student Awards Committee	fall 2014–2015
Student Evaluations of Teaching Committee	2014–2015
Colloquium Committee	2013–2014
Search Committee	2012–2013

- **Outreach Activities**

Creator and Organizer of Girls’ Math and Coding Day at JMU (an annual outreach event where 30 local female high school students from the AVID program come to James Madison University and learn mathematics and its applications with programming) Mar. 2022 - present

Workshop leader for madiSTEM (a one-day math and science conference for girls in grades 6-8 in the Shenandoah Valley), James Madison University Apr. 2011 and Apr. 2015

Volunteer Math Tutor summer 2010
The Arbor House (homeless shelter for single moms) Gainesville, FL

- **Others**

Conference Advisor The Second SIAM Gators Student Conference, University of Florida	2008–2009
President, SIAM Student Chapter, University of Florida	2007–2008

SKILLS

Computer skills: Fluent in C/C++ Programming, Matlab, Python, Git, and Latex.
Language: Bilingual in English and Korean.