Rohit Khandelwal

Curriculum Vitae

House no 2218, Sector 8
Faridabad, Haryana (121006), India
(+91) 7005719806
rkhandel@sau.int
DOB: May 4, 1992

Webpage: https://sites.google.com/view/rohitkhandelwal

Work Experience

14 Oct 2025 – present **South Asian University (SAU), New Delhi, India**, *Assistant Professor*, *Faculty of Mathematical Sciences (FMS)*.

14 Aug 2023 – 12 Sept 2025 **George Mason University, Fairfax, Virginia, USA**, *Post Doctoral Research Fellow*, *Department of Mathematical Sciences and Center for Mathematics and Artificial Intelligence (CMAI)*.
Advisor: Prof. Harbir Antil

17 Dec 2022 – 10 Aug 2023 **Government Science College (GSC) Chikhli, Navsari, Gujarat, India**, *Assistant Professor (Class-II)*, *Department of Mathematics*.

Education

Nov, 2022 **Indian Institute of Technology (IIT) Delhi, New Delhi, India**, *Doctor of Philosophy*, *Mathematics*.
Advisor: Prof. Kamana Porwal

- Thesis title: Pointwise A Posteriori Error Analysis of Finite Element Methods for Elliptic Variational Inequalities.
- Date of PhD Viva Voce: November 16, 2022.

2016 **Indian Institute of Technology (IIT) Madras, Chennai, India**, *Master of Science*, *Mathematics*.
CGPA: 7.88

- Project title: Quaternion's Algebras
- Advisor: Prof. Sarang Sane

2014 **University of Delhi, New Delhi, India**, *Bachelor of Science (Honours)*, *Mathematics*.
Percentage: 71

Fields of Interest

- **Digital Twins of Electromagnetics**
  - Optimal Control for the Maxwell's equation.

- **PDE Constrained Optimization**
  - Optimal Control for the Variational Inequalities (VI).
  - Trust Region Algorithm for Non-Smooth Optimization.

- **Nonsmooth optimization problems**
  - Fenchel Duality Theory.
  - A priori and A posteriori error identities.

- **Numerical Analysis and Scientific Computing**
  - Finite Element Methods for Elliptic and Parabolic VIs.
  - Adaptive Finite Element Method (AFEM).

Scholastic Achievements

- **Distinction Award 2023** for the PhD Dissertation, IIT Delhi, New Delhi, India.
- CMAI-GMU postdoctoral fellowship (August 2023–12 Sept 2025).
- **First rank** in the Gujarat Public Service Commission (GPSC) examination for the Assistant Professor (Class II) in 2019.
- CSIR-JRF Research Fellowship with All India Rank 60 (out of 15000) (2016).
- GATE Examination with All India Rank 34 (out of 8000) (2016).
- National Board for Higher Mathematics (NBHM) MA-MSc Scholarship (2015-16).
- IIT Madras Merit Cum scholarship.
- All India Rank 140 (out of 15000) in IIT JAM examination (2014).

Publications (Authors are listed alphabetically)

• In preparation

1. Harbir Antil, Robert J. Baraldi, R.K. and Drew P. Kouri. An Adaptive Finite Element Trust-Region Method.
2. Jimmy Adriazola, Harbir Antil, R.K, Yaw Owusu-Agyemang, and Denis Ridzal. An optimal control problem to mask space-time dependent sources.

• Submitted

3. Harbir Antil, Sean Carney and R.K. A Posteriori and A Priori Error Estimates for linearized thin sheet folding (2025). https://arxiv.org/pdf/2507.00807.
4. Harbir Antil and R.K. Elliptic Reconstruction and A Posteriori Error Estimates for Parabolic Variational Inequalities (2024). https://arxiv.org/pdf/2402.17724.
5. R.K, Kamana Porwal and Tanvi Wadhawan. Pointwise A Posteriori Error control of Quadratic Discontinuous Galerkin Finite Element Method for the Signorini problem (2023).
6. R.K, Kamana Porwal and Tanvi Wadhawan. Supremum norm A Posteriori Error control of Quadratic Finite Element Method for the Signorini problem (2023). https://arxiv.org/pdf/2401.02181.

• Published/Accepted

7. Harbir Antil, R.K and Umarkhon Rakhimov. A Discontinuous Galerkin Method for Optimal Control of the Obstacle Problem (2025). Journal of Applied and Numerical Optimization (JANO), 2025, 7(3): 459-477 pp.
8. Harbir Antil, Sören Bartels, Alex Kaltenbach and R.K. Variational problems with gradient constraints: A priori and a posteriori error identities (2025). Accepted in Mathematics of Computation, https://doi.org/10.1090/mcom/4146.
9. R.K, Kamana Porwal and Tanvi Wadhawan. Adaptive Quadratic finite element method for unilateral contact problem. Journal of Scientific Computing, 2023, 96(20). DOI: *doi.org/10.1007/s10915-023-02206-5.*
10. R.K, Kamana Porwal and Ritesh Singla. Supremum-norm a posteriori error control of quadratic discontinuous Galerkin methods for the obstacle problem. Computers and Mathematics with Applications, 2023, 137:147–171 pp.
11. R.K, and Kamana Porwal. Pointwise a posteriori error control of discontinuous Galerkin method for unilateral contact problems. Computational Methods in Applied Mathematics, 2023, 27(1):189–217 pp.
12. R.K, and Kamana Porwal. Pointwise a posteriori error analysis of quadratic finite element method for the elliptic obstacle problem. Journal of Computational and Applied Mathematics, 2022, 412, 114364. DOI: *doi.org/10.1016/j.cam.2022.114364.*
13. R.K, and Kamana Porwal. Pointwise a posteriori error analysis of a finite element method for the Signorini problem. Journal of Scientific Computing, 2022, 91(42). DOI: *doi.org/10.1007/s10915-022-01811-0.*

Grants

- Travel grant by "ICERM" to attend "Computational Learning for Model Reduction" (Jan 6 - Jan 10, 2025), Brown University, Providence, RI, USA.
- Travel grant by "NSF" to present a poster at "NSF Computational Mathematics PI Meeting 2024" (July 15-16, 2024), University of Washington, USA.

Colloquiums, Seminars and Conferences Organized

- Support team for "CMAI" Colloquium at George Mason University.
- Co-organized weekly "PDE Control seminar" jointly with Sandia National Laboratories.
- Co-organized a "SIAM Washington Baltimore Section Fall Meeting 2024", (December 6, 2024) (Organizers: Harbir Antil (GMU) and Keegan Kirk (GMU)).
- Co-organized a minisymposium at "25^{th} International Symposium on Mathematical Programming (ISMP) 2024", (July 21-26, 2024), Montreal, Canada. (Organizers: Harbir Antil (GMU) Robert J. Baraldi (Sandia) and Drew P. Kouri (Sandia)).
- Co-organized a minisymposium at "AMS Spring Eastern Sectional Meeting 2024" (April 6-7, 2024), Howard University, Washington DC, USA. (Organizers: Harbir Antil (GMU) and Sean Carney (Union College)).
- Support team for "Mathematical Opportunities in Digital Twins". (Dec 11-13, 2023). George Mason University (Arlington Campus), USA.

Mentoring

- Co-supervising Yaw Owusu-Agyemang (PhD student, GMU)
- Co-supervising Umarkhon Rakhimov (PhD student, GMU)

Peer Reviews

- IMA Journal of Numerical Analysis
- Mathematics of Computation

Teaching

- **Courses taught (GSC Chikhli, Navsari, Gujarat)**
  - Introduction to Real Analysis (Undergraduate level)
  - Ordinary and Partial Differential Equations (Undergraduate level)
  - Numerical Analysis (Undergraduate level)
  - Topology (Undergraduate level)
  - Metric Spaces (Undergraduate level)
- **Teaching Assistant (IIT Delhi)**
  - Finite Element Methods (Graduate level)
  - Computing Laboratory (Undergraduate level)
  - Numerical Analysis (Graduate level)
  - Calculus (Undergraduate level)
  - Linear Algebra and it's applications (Undergraduate level)

Colloquiums, Seminars and Conference Talks

- Poster Presentation at "Latest Advances in Computational and Applied Mathematics-2025 (LACAM-25)" (Dec 8-11, 2025), IISER Thiruvananthapuram, Kerala, India.
- "ENUMATH 2025" (Sept 1-5 2025), Heidelberg, Germany. (Research talk)
- "2025 International Conference on Continuous Optimization (ICCOPT)" (July 19-24, 2025), University of Southern California (USC), USA. (Research talk)
- "NSF Computational Mathematics Meeting 2025" (May 8-9, 2025), University of Utah, USA. (**Selected** talk)
- "SAYAS Numerics Day 2025" (May 3, 2025), University of Delaware, USA. (**Selected** talk)
- "Finite Element Circus" (April 25-26, 2025), Oakland University, Michigan, USA. (Research talk)
- "GMU Math Colloquium" (April 4, 2025), George Mason University, Fairfax, VA, USA. (**Invited** talk)
- "Georgetown Doctoral Seminar" (March 26, 2025), Georgetown University, Washington DC, USA. (**Invited** talk)
- Poster Presentation at "ICERM: Computational Learning for Model Reduction" (Jan 6 - Jan 10, 2025), Brown University, Providence, RI, USA.
- Poster Presentation at "SIAM Washington-Baltimore Section Meeting" (December 6, 2024), George Mason University (Arlington Campus), USA.
- "Mathematics and Climate Research Network (MCRN) Colloquium Talk" (Nov 18, 2024), Hybrid mode (**Invited** talk)
- "Finite Element Circus" (Oct 18-19, 2024), University of Maryland, Baltimore County, USA. (Research talk)
- "CMAI Colloquium Talk" (Sept 27, 2024), George Mason University, Fairfax, VA, USA. (**Invited** talk)
- "Computational and Applied Mathematics" (CAM) Colloquium talk, (Sept 23, 2024), Penn State University, PA, USA. (**Invited** talk)
- "25^{th} International Symposium on Mathematical Programming (ISMP) 2024", (July 21-26, 2024), Montreal, Canada. (**Invited** talk)
- Poster Presentation at "NSF Computational Mathematics Meeting 2024" (July 15-16, 2024), University of Washington, USA.
- "**SIAM** Conference on Mathematical Aspects of Materials Science 2024 (MS24)" (May 19-23, 2024), Pittsburgh, PA, USA. (**Invited** talk)
- "SAYAS Numerics Day 2024" (May 11, 2024), George Mason University (Arlington Campus), USA. (**Selected** talk)
- "Finite Element Circus" (April 19-20, 2024), Brown University, Providence, RI, USA. (Research talk)
- "Spring 2024 Conference on Applied Mathematics" (April 13, 2024), The George Washington University, Washington DC, USA. (**Invited** talk)
- "AMS Spring Eastern Sectional Meeting 2024" (April 6-7, 2024), Howard University, Washington DC, USA. (**Invited** talk)
- "2024 Informs Optimization Society (IOS) Conference" (March 22-24, 2024), Houston, Texas, USA. (**Invited** talk)
- "Mathematics Colloquium" in virtual mode (March 1, 2024), Virginia State University, USA. (**Invited** talk)
- "CMAI Colloquium Talk" (February 23, 2024), George Mason University, Fairfax, VA, USA. (**Invited** talk)
- Poster Presentation at "Mathematical Opportunities in Digital Twins". (Dec 11-13, 2023). George Mason University (Arlington Campus), USA.
- "Numerical Analysis Seminar (NAS)" (Dec 5, 2023), University of Maryland, College Park, USA. (**Invited** talk)
- "Finite Element Circus" (Oct 20-21, 2023), University of Notre Dam, South Bend, USA. (Research talk)

Workshops Attended

- "Finite elements for Non-Linear and Multi scale problems". (Feb 28 - March 3, 2020). Indian Institute of Science, Bengaluru.
- "ATM IST PDE : Theory and Computation". (July 23 - August 4, 2018). Indian Institute of Science, Bengaluru.
- "National Workshop on Nonlinear Functional Analysis and Its Applications". (February 19-24, 2018). Graphic Era (Deemed to be University), Dehradun.
- "ndo-German Workshop On "Optimal control, Inverse problems and their applications". (February 7-9, 2018). Indian Institute of Technology, Delhi.
- GIAN Course "Isogeometric methods using B splines and nurbs". (December 16-20, 2017). Indian Institute of Technology, Varanasi.
- GIAN Course "Computational Solutions of Hyperbolic PDEs for Scientists, Engineers and Mathematicians". (December 4-16, 2017). Indian Institute of Technology, Delhi.

References

1. Prof. Harbir Antil
   Professor, CMAI and Department of Mathematical Sciences
   George Mason University, Fairfax, VA, USA, 22030.
   Email: hantil@gmu.edu

2. Prof. Sören Bartels
   Professor, Deparment of Applied Mathematics
   Albert-Ludwigs-University Freiburg
   Postfach, Freiburg, Germany 79085.
   Email: bartels@mathematik.uni-freiburg.de

3. Prof. Kamana Porwal
   Associate Professor, Department of Mathematics
   Indian Institute of Technology (IIT) Delhi, Delhi, India, 110016.
   Email: kamana@maths.iitd.ac.in

4. Dr. Denis Ridzal
   Distinguished Member of Technical Staff
   Optimization and Uncertainty Quantification Department
   Sandia National Laboratories, Albuquerque, NM, USA 87123.
   Email: dridzal@sandia.gov