

Rohit Khandelwal

Curriculum Vitae

House no 2218, Sector 8
Faridabad, Haryana (121006), India
✉ 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**
 - Trust Region Algorithm for Non-Smooth Optimization.
 - Optimal Control for the Variational Inequalities (VI).
- **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).

Projects/Grants

- Faculty Research Grant (FRG), South Asian University (2026-2028): 15 Lacs (INR)
- Prime Minister Early Career Research Grant (ANRF, 2026-2029): 32 Lacs (INR)
- Travel grant by "ICERM" to attend "Computational Learning for Model Reduction" (Jan 6 - Jan 10, 2025), Brown University, Providence, RI, USA: 1500 USD
- Travel grant by "NSF" to present a poster at "NSF Computational Mathematics PI Meeting 2024" (July 15-16, 2024), University of Washington, USA: 2000 USD

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).

Group

- **PhD Student**
- Shrashti Tamrakar (2026 onwards)

• Submitted

1. R.K. and Zongyuan Li. On the $W^{2,p}$ solvability for the mixed boundary value problems (2026) <https://arxiv.org/pdf/2609.30090>.
2. Harbir Antil, Yaw Owusu-Agyemang, R.K, Jimmy Adiazola and Denis Ridzal. Structure-preserving optimal control of Maxwell's equations with applications to source cloaking (2026) <https://arxiv.org/pdf/2605.00212>.
3. Harbir Antil, Robert J. Baraldi, R.K. and Drew P. Kouri. An online adaptive finite-element method for nonsmooth PDE-constrained optimization (2026) <https://arxiv.org/pdf/2604.24065>.
4. 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>.
5. Harbir Antil and R.K. Elliptic Reconstruction and A Posteriori Error Estimates for Parabolic Variational Inequalities (2024) <https://arxiv.org/pdf/2402.17724>.
6. R.K, Kamana Porwal and Tanvi Wadhawan. Pointwise A Posteriori Error control of Quadratic Discontinuous Galerkin Finite Element Method for the Signorini problem (2023).
7. 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

8. Yaw Owusu-Agyemang, Denis Ridzal, Tim Wildey, R.K, and Harbir Antil. Numerical Studies of Optimal Control Problems Governed by the Time-Dependent Maxwell's Equations. (SAND Report No. SAND2025-142670). Computer Science Research Institute Summer Proceedings 2025, Sandia National Laboratories, Albuquerque, NM Livermore, CA (2025).
9. Harbir Antil, R.K and Umarmkhon Rakhimov. A Discontinuous Galerkin Method for Optimal Control of the Obstacle Problem. Journal of Applied and Numerical Optimization (JANO), 2025, 7(3): 459-477 pp.
10. 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 (Math.Comp.), <https://doi.org/10.1090/mcom/4146>.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.

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 "25th 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-supervised Yaw Owusu-Agyemang (PhD student, GMU, 2023–2025)
- Co-supervised Umarchon Rakhimov (PhD student, GMU, 2023–2025)

Peer Reviews

- IMA Journal of Numerical Analysis
- Mathematics of Computation

Teaching

● Courses taught (SAU, India)

- Statistical Methods (Spring 2026, Master level)
- Numerical Methods for ODE (Spring 2026, Master level)
- Measure and Integration (Spring 2026, Master level)
- Probability and Statistics (Fall 2026, Undergraduate level)

● 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 its applications (Undergraduate level)

Colloquiums, Seminars and Conference Talks

- "Computational Methods in Applied Mathematics (CMAM) 2026" (July 20-24, 2026), TU Wien, Vienna, Austria. (Research talk)
- 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)
- "25th 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

- “PDEs in Action, from multi-scale to inverse problems” (June 22-24, 2026), Indian Institute of Science, Bangalore.
- “Finite elements for Non-Linear and Multi scale problems”. (Feb 28 - March 3, 2020). Indian Institute of Science, Bangalore.
- “ATM IST PDE : Theory and Computation”. (July 23 - August 4, 2018). Indian Institute of Science, Bangalore.
- “National Workshop on Nonlinear Functional Analysis and Its Applications”. (February 19-24, 2018). Graphic Era (Deemed to be University), Dehradun.
- “Indo-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.