Harbir Antil

Department of Mathematical Sciences | George Mason University | Fairfax, VA 22030
hantil@gmu.edu | https://math.gmu.edu/~hantil | 832-643-8847

Education

December 2009	Ph.D. in Mathematics, University of Houston, TX.
May 2006	M.S. in Mathematics, University of Houston, TX.
2001–2004	B.Sc. in Physics, St. Stephen's College, University of Delhi, Delhi, India.

Professional Record

2012 – Present	Professor (2021-), Associate Professor (2017-21), Assistant Professor (2012-17) at George Mason University, Fairfax, Virginia.
2020 – Present	Director/Founder, Center for Mathematics & Artificial Intelligence, https://cmai.gmu.edu
2022 – Present	Member of Science & Technology Experts Group (ISTEG), National Academy of Sciences, Engineering and Medicine.
2022 – Present	President (2023-), Vice President (2022-23) SIAM DC-Maryland-Virginia Section.
2020 – Present	Contractor, Sandia National Labs, Albuquerque, NM
2021 – 2024	Editor in Chief (EiC): Advances in Continuous and Discrete Models (ACDM), Springer.
2016 – 2023	Affiliate Prof. at Univ. of Delaware (2019-23), Visiting Prof. at Iowa State University (2016-17).
2010 – 2012	Postdoctoral researcher at University of Maryland, MD (2011-12): *Mentor- Ricardo H. Nochetto*; Postdoctoral researcher at Rice University, TX (2010): *Mentor- Matthias Heinkenschloss*.
2006 – 2009	Research assistant, University of Houston.
2005 – 2006	Teaching assistant, University of Houston.
2006 – 2008	Summer Intern at Schlumberger, Sugarland, TX during Summers 2006, 2007, 2008.

Research Interests

Numerical solution of partial differential equations (PDEs), numerical solution of large scale nonlinear optimization problems, numerical solution of optimal control problems, risk averse optimization of PDEs, error analysis for nonsmooth variational and optimal control problems, model reduction, free boundary problems, application of optimization in science and engineering.

Awards and Honors

January – May 2026	Research Fellow at ICERM, Brown University.
January 4-7, 2026	Plenary (SIAM) speaker at Joint Math Meetings (JMM), Washington, D.C..
March 19, 2025	Plenary speaker "AI in the New Administration: The Future of the CAIO". The event is organized by the Media Company: Government Executive. https://events.nextgov.com/future-of-the-caio/
February 26, 2025	Mason Science Series speaker. Hosted by the Dean of College of Science, George Mason University. https://www.youtube.com/watch?v=oVi1SAdSRtI&t=137s

February 20, 2025	Plenary speaker at "AI In The C-SUITE: The Role of the CIAO". The event is organized by the Media Company: Government Executive. https://events.nextgov.com/ai-in-the-c-suite/
December 9, 2024	Plenary speaker at the Capitol Hill to discuss "Role of Digital Twins in Medical Sciences"
2024	Dean's Research Scientist Award. College of Science, George Mason University
2020	NSF research highlight, https://content.govdelivery.com/accounts/USNSF/bulletins/2afd541
2020-21	Our research on optimization of airflow in built environment appeared as 3 New York Times articles.
Aug. – Dec. 2020	Research Fellow at ICERM, Brown University.
2020	George Mason's 2020 Career Connection Faculty Award for making a positive impact on students' career goals, employment plans, and graduate school preparation.
2017 and 2012	US Junior Oberwolfach Fellow 2012 (https://owpdb.mfo.de/detail?photo_id=17252); 2015 (https://owpdb.mfo.de/detail?photo_id=21483).
2015	Dean's Early-Career Excellence Award, College of Science, George Mason University.

Grants

Examples of Direct Research Impact on Society.

- **Digital Twins**: Research is informing US and New Zealand transportation authorities in setting thermal stress guidelines for highway infrastructure.
- **Indoor Airflow Optimization**: Featured in three *New York Times* articles, shaped CDC safety guidelines during COVID-19, and highlighted by NSF https://content.govdelivery.com/accounts/USNSF/bulletins/2afd541.
- **Reduced-Order Methods**: Contributed to the first detection of gravitational waves, supporting the Nobel Prize in Physics.
- **Biomedical Modeling**: Aneurysm blood-flow sensitivity studies are guiding clinical decisions for vascular surgeons.
- **Optimization and Neuromorphic Imaging**: Selected as an AFRL Research Highlight; related algorithms are deployed on the International Space Station for tracking.

Regular Grants.

October 2025 – September 2028 **$270,000**
Sandia National Labs (Department of Energy)
Optimal Control of Maxwell Equations
PI: **H. Antil**

August 2025 – July 2028 **$800,000**
Air Force Office of Scientific Research (AFOSR)
Penalty-Free, Accelerated and Scalable Training and Optimization (PFAST-Opt)
PI: **H. Antil**

August 2024 – July 2027 **$275,000**
National Science Foundation
Structure Preserving Optimization Algorithms and Digital Twins
PI: **H. Antil**

April 2024 – March 2025 **$357,868**
Air Force Office of Scientific Research (AFOSR)
DURIP: Optimization for Neuromorphic Imaging and Digital Twins
PI: **H. Antil**

February 2024 – January 2028 **$1,330,506**
Office of Naval Research (ONR)
Efficient Algorithms for Optimization Problems with PDE Constraints
PI: **H. Antil**

April 2022 – September 2023 **$1,000,000**
Defense Advanced Research Projects Agency (DARPA)
Geometries of Learning (GoL)
PI: **H. Antil**; GMU share: $202,000; Teledyne share: $798,000; co-PI: Tyrus Berry

March 2022 – August 2025 **$850,000**
Air Force Office of Scientific Research (AFOSR)
Compression and Randomization for Extreme-Scale Training and Optimization (CREST OPT)
PI: **H. Antil**

August 2021 – July 2025 **$340,000**
National Science Foundation (DMS-2110263)
Algorithms and Numerics for Optimization Problems with PDEs
PI: **H. Antil**

May – Oct. 2022 **$75,000**
Defense Threat Reduction Agency (DTRA)
Numerics Informed Neural Networks (NINNs)
PI: **H. Antil (co-PI)**; Other co-PI: R. Löhner

May 2021 – October 2022 **$500,000**
Air Force Office of Scientific Research (AFOSR)
DURIP: Optimization, Control, Networks and Learning from Data
PI: **H. Antil**; co-PIs: R. Löhner, M. Warma

Sep. 2021 – Aug. 2022 **$180,000**
Defense Threat Reduction Agency (DTRA)
Deep Neural Nets for Chemically Reacting Flows
PI: **H. Antil (co-PI)**; Other co-PIs: R. Löhner

July 2020 – December 2021 **$21,242**
NIST: National Institute of Standards and Technology
Algorithms for Image and Shape Analysis in 3D
PI: **H. Antil**

July 2020 – July 2021 **$150,000**
Defense Threat Reduction Agency (DTRA)
NNCHEM: Neural-Net/Deep Learning Based Chemical Reaction Package
PI: **Rainald Löhner and H. Antil**

February 2020 – February 2022 **$200,000**
Department of Navy, Naval PostGraduate School (Award NO: N00244-20-1-0005)
Constrained Optimization and Machine Learning
PI: **H. Antil**

July 2019 – June 2022 **$320,000 (GMU share: $100,000)**
National Science Foundation (DMS-1913004)
Collaborative Research: Multilevel Methods for Optimal Control of PDEs and Optimization-Based Domain Decomposition
PI: **H. Antil (GMU Single-PI)**; Other collaborators: Andrei Drăgănescu, Bedřich Sousedík (UMBC)

Jan. 2019 – Dec. 2021 **$800,000 (GMU share: $300,000; Sandia Lab share: $500,000)**
Air Force Office of Scientific Research (AFOSR), Award NO: FA9550-19-1-0036
Structure Exploiting Trust Regions for Bilevel and Risk-Averse Optimization
PI: **H. Antil**

Jan. – May 2019 **$22,236**
Contract with Sandia National Laboratories, Albuquerque, NM
Fractional differential operators for features detection in the subsurface
PI: **H. Antil (Single-PI)**

Aug. 2018 – July 2021 **$200,000**
National Science Foundation (DMS-1818772)
PDE Constrained Optimization: Algorithms, Numerics, and Applications
PI: **H. Antil (Single-PI)**

Jan. – May 2018 **$15,472**
Contract with Sandia National Laboratories, Albuquerque, NM
Fractional differential operators for features detection in the subsurface
PI: **H. Antil (Single-PI)**

June 2015 – May 2019 **$140,000**
National Science Foundation (DMS-1521590)
Numerical Analysis of PDE Constrained Optimization Problems
PI: **H. Antil (Single-PI)**

2014 – 2019 **$600,000**
National Science Foundation (DMS-1407087)
EXTREEMS-QED: Undergraduate Research in Computational and Data-Enabled Mathematics
PI: **M. Emelianenko (PI)**; co-PIs: D. Anderson, H. Antil, E. Sander, T. Wanner

2013 – 2014 **$28,079**
Deutsche Forschungsgemeinschaft (DFG)
International Collaboration Grant: Optimal Control of Electrowetting on Dielectric
PI: **M. Hintermüller (PI, Humboldt University, Berlin)**; co-PIs: H. Antil, R. H. Nochetto (Univ. of Maryland, College Park)

Conference Grants.

January 2025 – 2026 **$21,510**
National Science Foundation (DMS-2503030)
Fifth East Coast Optimization Meeting
PI: **H. Antil**

August 1, 2023 – July 31, 2024 **$99,948**
National Science Foundation (DMS-2330895)
Mathematical Opportunities in Digital Twins (MATH-DT)
PI: **H. Antil** ; co-PIs: Benjamin Seibold (Temple Univ.), Kathrin Smetana (Stevens Inst. of Tech.)

June 9 – 11, 2022 **$24,121**
National Science Foundation (DMS-2213723)
Nonlocal School on Fractional Equations (NSFE 2022)
PI: **H. Antil (PI)**; co-PI: P.R. Stinga (Iowa State Univ.)

June 9 – 11, 2022 **$2,500**
Institute for Mathematics and its Applications (IMA)
Nonlocal School on Fractional Equations (NSFE 2022)
PI: **H. Antil** ; Other co-PIs: P.R. Stinga, Paul Sacks (Iowa State Univ.)

October 2021 **$30,000**
Lorentz Center (Netherlands)
Workshop: Nonlocality in Analysis, Numerics and Applications
PI: **H. Antil** ; co-PIs: Patrick Dondl, Qiang Du, Carolin Kreisbeck

April 2019 – August 2021 **$17,680**
National Science Foundation (DMS-1907412)
East Coast Optimization Meeting 2019
PI: **H. Antil**

April 4 – 5, 2019 **$12,500**
Mathematical Sciences ($7.5K) and COS ($5K), George Mason Univ.
East Coast Optimization Meeting 2019
PI: **H. Antil**

March 12 – 16, 2018 **$6,100**
NCM Workshop, Indian Institute of Technology (India)
New Directions in PDE Constrained Optimization
PI: **H. Antil (co-PI)**; Other co-PIs: A. Kumar (Shiv Nadar Univ., India), N. Nataraj (IIT Bombay, India), T.M. Surowiec (Marburg, Germany)

Aug. 17 – 19, 2017 **$5,000**
Institute for Mathematics and its Applications (IMA)
Nonlocal School on Fractional Equations (NSFE 2017)
PI: **H. Antil (co-PI)**; Other co-PI: P.R. Stinga (Iowa State Univ.)

June 6 – 10, 2016 **$60,000**
NSF and ExxonMobil Research and Engineering Company
Frontiers in PDE Constrained Optimization
PI: **H. Antil** ; Other co-PIs: D. Kouri, D. Ridzal (Sandia National Labs), M. Lacasse (ExxonMobil)

Publications

($\star\star$ publications with students and postdocs)

Submitted

1. H. Antil and A. Lentz. A Smoothed Proximal Trust-Region Algorithm for Nonconvex Optimization with L^p-regularization, $p \in (0, 1)$. Submitted (2025).

2. ⋆⋆ **H. Antil**, S. Carney, and R. Khandelwal. A Posteriori and A Priori Error Estimates for Linearized Thin Sheet Folding. Submitted (2025). https://arxiv.org/pdf/2507.00807
3. **H. Antil**, D. Mizuno, K. Shirakawa. Optimal Control of Pseudo-Parabolic KWC Systems for Grain Boundary Motion. Submitted 2025. https://arxiv.org/pdf/2506.09407
4. ⋆⋆ T. Ansari, S. Warnakulasuriya, R. Löhner, R. Wüchner, **H. Antil**, I. Antonau, F. Airaudo. Adjoint-Based High-Fidelity Load Identification using Deformation Measurements for Static and Dynamic Problems. Submitted, 2025.
5. ⋆⋆ T. Ansari, F. Airaudo, S. Warnakulasuriya, I. Antonau, R. Löhner, **H. Antil**, and R. Wüchner. System Identification in Structures Subject to Dynamic Loading. Submitted, 2025.
6. R. Baraldi, D.P. Kouri, and **H. Antil**. Memory-Efficient Nonsmooth Dynamic Optimization using Adaptive Randomized Compression. Submitted 2025.
7. **H. Antil**, S. Dolgov, and A. Onwunta. Tensor train solution to uncertain optimization problems with shared sparsity penalty. Submitted 2024. https://arxiv.org/pdf/2411.03989
8. ⋆⋆K. Green and **H. Antil**. A Generic MATLAB Toolbox to Approximate PDEs Using Computational Geometry. Submitted 2024. https://arxiv.org/pdf/2410.12026
9. ⋆⋆ **H. Antil**, D. Blauvelt, and D. Sayre. Dynamic Reconstruction from Neuromorphic Data. Submitted 2024. https://arxiv.org/pdf/2408.15465
10. ⋆⋆ **H. Antil** and R. Khandelwal. Elliptic Reconstruction and A Posteriori Error Estimates for Parabolic Variational Inequalities. Submitted 2024. https://arxiv.org/pdf/2402.17724.pdf
11. H. Antil. Mathematical Opportunities in Digital Twins. Submitted 2024. https://arxiv.org/pdf/2402.10326.pdf
12. ⋆⋆ **H. Antil**, R. Khandelwal, and U. Rakhimov. A Discontinuous Galerkin Method for Optimal Control of the Obstacle Problem. Submitted 2023. https://arxiv.org/pdf/2312.12582.pdf
13. ⋆⋆ **H. Antil**, M. Gupta, and R. Price. A Note on Dimensionality Reduction in Deep Neural Networks using Empirical Interpolation Method. Submitted 2023. https://arxiv.org/pdf/2305.09842.pdf
14. ⋆⋆**H. Antil** and H. Díaz. Boundary Control of Time-Harmonic Eddy Current Equations. Submitted 2021. https://arxiv.org/pdf/2209.15129.pdf
15. **H. Antil**, C. Lizama, R. Ponce, and M. Warma. Convergence of solutions of discrete semi-linear space-time fractional evolution equations. Submitted 2019. https://arxiv.org/pdf/1910.07358.pdf

Books

16. H. Antil, D.P. Kouri, M. Lacasse, and D. Ridzal. *Frontiers in PDE-constrained Optimization.* The IMA Volumes in Mathematics and its Applications 163, Springer. 2018 https://www.springer.com/us/book/9781493986354

    Book Review: SIAM Review Vol. 61, Issue 4 (December 2019)

Accepted / Published Journal Articles

17. ⋆⋆ **H. Antil**, A. Kaltenbach, and K. Kirk. Duality-Based Algorithm and Numerical Analysis for Optimal Insulation Problems on Non-Smooth Domains. Accepted in SIAM J. of Control and Optimization, 2025. Preprint: https://arxiv.org/pdf/2505.04571
18. ⋆⋆ **H. Antil**, S. Carney, H. Díaz and J. Royset. Rockafellian Relaxation for PDE Constrained Optimization with Distributional Ambiguity. Accepted in SIAM J. of Optimization, 2025. Preprint: https://arxiv.org/pdf/2405.00176

19. ⋆⋆ **H. Antil**, A. Kaltenbach, and K. Kirk. Modeling and Analysis of an Optimal Insulation Problem on Non-Smooth Domains. Accepted in SIAM J. of Math Analysis, 2025. Preprint: https://arxiv.org/pdf/2503.11903

20. ⋆⋆ **H. Antil**, S. Bartels, A. Kaltenbach, and R. Khandelwal. Variational problems with gradient constraints: A priori and a posteriori error identities. Accepted in Math. of Computation 2025. Preprint: https://arxiv.org/pdf/2410.18780

21. ⋆⋆ **H. Antil**, S. Dolgov, and A. Onwunta Smoothed Moreau-Yosida Tensor Train Approximation of State-constrained Optimization Problems under Uncertainty. Numerical Linear Algebra with Applications (2025). DOI: 10.1002/nla.70028

22. ⋆⋆ T.S.A. Ansari, R. Loehner, R. Wuechner, **H. Antil**, K-U. Bletzinger, S. Warnakulasuriya, I. Antonau, and F. Airaudo. Adjoint-Based Recovery of Thermal Fields From Displacement or Strain Measurements. Computer Methods in Applied Mechanics and Engineering (CMAME). Volume 438, Part A, 1 April 2025, 117818. DOI: https://doi.org/10.1016/j.cma.2025.117818

23. ⋆⋆ **H. Antil**, M.O. Horton, and M. Warma. Exterior Nonlocal Variational Inequalities. Math Control & Related Fields, 2025. DOI: doi:10.3934/mcrf.2025013

24. ⋆⋆ F. Airaudo, **H. Antil**, R. Löhner. Conditional Value at Risk to Identify Weaknesses in Structural Digital Twins. Finite Elements in Analysis & Design, Volume 245, March 2025, 104316. DOI: https://doi.org/10.1016/j.finel.2025.104316

25. ⋆⋆**H. Antil**, R. Arndt, B.S. Mordukhovich, D. Nguyen, C.N. Rautenberg. Optimal Control of a Quasi-Variational Sweeping Process. Math Control & Related Fields, 2025. DOI: 10.3934/mcrf.2025010

26. ⋆⋆**H. Antil** and D. Sayre. GNEP Based Dynamic Segmentation and Motion Estimation for Neuromorphic Imaging. Foundations of Data Science, Volume 7, Issue 1: 1-22 (2025). DOI: 10.3934/fods.2024026

27. **H. Antil**, D. Mizuno, K. Shirakawa, and N. Ukai. A Gradient System Based on Anisotropic Monochrome Image Processing with Orientation Auto-Adjustment. Advances in Mathematical Sciences and Applications, 2024. DOI: https://mcm-www.jwu.ac.jp/~aikit/AMSA/pdf/abstract/2024/Top_2024_042.pdf

28. ⋆⋆**H. Antil**, R. Löhner, and R. Price. NINNs: Nudging Induced Neural Networks. Physica D: Nonlinear Phenomena. Volume 470, Part A, December 2024, 134364. DOI: https://doi.org/10.1016/j.physd.2024.134364

29. **H. Antil**, D. Mizuno, and K. Shirakawa. Well-Posedness of a Pseudo-Parabolic KWC System in Materials Science. SIAM J. of Math Analysis, **56** (5), pp. 6422-6445, 2024. DOI: https://doi.org/10.1137/24M163952X

30. ⋆⋆ R. Löhner, F. Airaudo, **H. Antil**, R. Wüchner, F. Meister, S. Warnakulasuriya. High-Fidelity Digital Twins: Detecting and Localizing Weaknesses in Structures. nternational Journal for Numerical Methods in Engineering (IJNME). DOI: https://doi.org/10.1002/nme.7568

31. **H. Antil** and P. Manns. Integer Optimal Control with Fractional Perimeter Regularization. Applied Mathematics & Optimization. Volume 90, article number 14, (2024). DOI: https://doi.org/10.1007/s00245-024-10157-y

32. ⋆⋆ M. Panagoda, T. Berry and **H. Antil**. Convergence Analysis of the Rank Restricted Soft SVD Algorithm. Foundations of Data Science, Volume 6, Issue 3 (2024). DOI: 10.3934/fods.2024014

33. **H. Antil**, U. Biccari, R. Ponce, M. Warma, and S. Zamorano. Controllability properties from the exterior under positivity constraints for a 1–D fractional heat equation. Evolution Equations and Control Theory, Volume 13, Issue 3: 893-924 (2024). DOI: 10.3934/eect.2024010

34. ⋆⋆ A. Mahler, T. Berry, T. Stephens, **H. Antil**, M. Merritt, J. Schreiber, and I. Kevrekidis. On-Manifold Projected Gradient Descent. Frontiers in Computer Science, section Computer Vision, Vol 6, 2024. DOI: https://doi.org/10.3389/fcomp.2024.1274181

35. R. Löhner, *H. Antil*, J.R. Cebral, and F. Mut. Adjoint-Based Estimation of Sensitivity of Clinical Measures to Boundary Conditions for Arteries. J. of Comp. Physics, 2024. DOI: https://doi.org/10.1016/j.jcp.2023.112619

36. ⋆⋆ M. Alshehri, *H. Antil*, E. Herberg, and D.P. Kouri. An Inexact Semismooth Newton Method with Application to Adaptive Randomized Sketching for Dynamic Optimization. Finite Elements in Analysis & Design, Vol 228, Year 2024. DOI: https://doi.org/10.1016/j.finel.2023.104052

37. ⋆⋆ R. Vaughn, T. Berry, and **H. Antil**. Diffusion Maps for Embedded Manifolds with Boundary with Applications to PDEs. Applied and Computational Harmonic Analysis, **68** (2024). DOI: https://doi.org/10.1016/j.acha.2023.101593

38. ⋆⋆ **H. Antil**, H. Díaz, T. Jing, and A. Schikorra. Nonlocal Bounded Variation with Applications. SIAM J. of Math Analysis, **56** (2), 1903–1935, 2024. DOI: https://doi.org/10.1137/22M1520876

39. ⋆⋆**H. Antil**, P. Dondl, and L. Striet. Analysis of a *sinc*-Galerkin Method for the Fractional Laplacian. Accepted in SIAM J. of Numerical Analysis. Vol. 61, Iss. 6 (2023). DOI: 10.1137/22M1542374

40. ⋆⋆F. Airaudo, R. Löhner, R. Wüchner and **H. Antil**. Adjoint-Based Determination of Weaknesses in Structures. Computer Methods in Applied Mechanics and Engineering (CMAME), Vol 417, Year 2023. DOI: https://doi.org/10.1016/j.cma.2023.116471

41. **H. Antil** and A.K. Saibaba. Randomized Reduced Basis Methods for Parameterized Fractional Elliptic PDEs. Finite Elements in Analysis & Design, Vol 227, Year 2023. DOI: https://doi.org/10.1016/j.finel.2023.104046

42. **H. Antil**, L. Betz, and D. Wachsmuth. Strong Stationarity for Optimal Control Problems with Non-smooth Integral Equation Constraints: Application to Continuous DNNs. Appl Math Optim **88**, 84 (2023). DOI: https://doi.org/10.1007/s00245-023-10059-5

43. ⋆⋆**H. Antil**, H. Díaz, and E. Herberg. An Optimal Time Variable Learning Framework for Deep Neural Networks. Accepted in Annals of Mathematical Sciences and Applications 2023. https://www.intlpress.com/site/pub/pages/journals/items/amsa/_home/acceptedpapers/index.php

44. ⋆⋆**H. Antil** and D. Sayre. Bilevel Inverse Problems for Neuromorphic Imaging. Inverse Problems, **68**, 9 (2023). DOI: 10.1088/1361-6420/ace7c7

45. ⋆⋆ **H. Antil**, H.C. Elman, A. Onwunta, D. Verma. A Deep Neural Network Approach for Parameterized PDEs and Bayesian Inverse Problems. Machine Learning: Science and Technology, **4**, 3 (2023). DOI: 10.1088/2632-2153/ace67c

46. **H. Antil**, D.P. Kouri, D. Ridzal, D.B. Robinson, and M. Salloum. Uniform flow in axisymmetric devices through permeability optimization. Optim Eng (2023). https://doi.org/10.1007/s11081-023-09820-0

47. R. Löhner and **H. Antil**. Neural Networks Representation for Time Integrators. International Journal for Numerical Methods in Engineering (IJNME) 2023. DOI: https://doi.org/10.1002/nme.7306

48. ⋆⋆**H. Antil**, R. Löhner, R. Price. Data Assimilation with Deep Neural Nets Informed by Nudging. In: Rozza, G., Stabile, G., Gunzburger, M., D'Elia, M. (eds) Reduction, Approximation, Machine Learning, Surrogates, Emulators and Simulators. Lecture Notes in Computational Science and Engineering, vol 151. Springer, Cham. DOI: https://doi.org/10.1007/978-3-031-55060-7_2

49. **H. Antil** and A.K. Saibaba. Efficient Algorithms for Bayesian Inverse Problems with Whittle-Matérn Priors. SIAM Journal of Scientific Computing, 2023. DOI: https://doi.org/10.1137/22M1494397

50. Z. Zou, S. Mukherjee, **H. Antil**, and W. Aquino. Adaptive particle-based approximation of the Gibbs posterior for inverse problems. Communications in Optimization Theory, 2023. DOI: 10.23952/cot.2023.18

51. **H. Antil** and D. Wachsmuth. Sparse Optimization Problems in Fractional Order Sobolev Spaces. Inverse Problems, 2023, Volume 39, Number 4. DOI: 10.1088/1361-6420/acbe5e

52. **H. Antil**, D.P. Kouri, and D. Ridzal. ALESQP: An Augmented Lagrangian Equality-constrained SQP Method for Optimization with General Constraints. SIAM J. of Optimization, 2023. DOI: https://doi.org/10.1137/20M137839

53. **H. Antil**, S. Bartels, and A. Schikorra. Approximation of Fractional Harmonic Maps. IMA Journal of Numerical Analysis, Volume 43, Issue 3, May 2023, Pages 1291–1323, DOI: https://doi.org/10.1093/imanum/drac029

54. ⋆⋆**H. Antil**, S. Dolgov and A. Onwunta. TTRISK: Tensor Train Decomposition Algorithm for Risk Averse Optimization. Numerical Linear Algebra and Applications (NLAA), 2022. https://doi.org/10.1002/nla.2481

55. ⋆⋆**H. Antil**, T.S Brown, R. Loehner, F. Togashi, and D. Verma. Deep Neural Nets with Fixed Bias Configuration. Numer. Algebra Control Optim. (NACO) 2022. DOI: doi:10.3934/naco.2022016

56. ⋆⋆ **H. Antil**, T.S. Brown, D. Verma and M. Warma. Optimal Control of Fractional PDEs with State and Control Constraints. Pure and Applied Functional Analysis, Volume 7, Number 5, Pages 1533–1560, Year 2022.

57. R. Löhner, **H. Antil**, J.M. Gimenez, S. Idelsohn, and E. Oñate. A Deterministic Pathogen Transmission Model Based on High-Fidelity Physics. Computer Methods in Applied Mechanics and Engineering (CMAME), Volume 401, Part A, 1 November 2022, 114929. DOI: https://doi.org/10.1016/j.cma.2022.114929.

58. **H. Antil**, S. Kubota, K. Shirakawa, and N. Yamazaki. Temperature Control of PDE Constrained Optimization Problems Governed by Kobayashi-Warren-Carter Type Models of Grain Boundary Motions. Advances in Nonlinear Analysis 2022. DOI: https://doi.org/10.1515/anona-2022-0242.

59. ⋆⋆ **H. Antil**, R. Arndt, C.N. Rautenberg and D. Verma. Non-Diffusive Variational Problems with Distributional and Weak Gradient Constraints. Advances in Nonlinear Analysis 2022. DOI: https://doi.org/10.1515/anona-2022-0227.

60. ⋆⋆ T Shi, **H. Antil**, and D.P. Kouri. Spectral, Tensor and Domain Decomposition Methods for Fractional PDEs. Computational Methods in Applied Mathematics, 2022. DOI: https://doi.org/10.1515/cmam-2021-0118

61. ⋆⋆ T.N.T. Quyen, **H. Antil**, and Hugo Diaz. Optimal Control of Parameterized Maxwell's System: Reduced Basis, Convergence Analysis, and A Posteriori Error Estimates. Math Control & Related Fields, 2022. DOI: doi:10.3934/mcrf.2022003

62. **H. Antil**, C.G. Gal and M. Warma. A Unified Framework for Optimal Control of Fractional in Time Subdiffusive Semilinear PDEs. Discrete and Continuous Dynamical Systems Series S. 15(8): 1883-1918, 2022. doi: 10.3934/dcdss.2022012

63. S. Hardesty, **H. Antil**, D.P. Kouri, and D. Ridzal. The Strip Method for Shape Derivatives. To appear in International Journal for Numerical Methods in Engineering (IJNME) 2021. DOI: https://doi.org/10.1002/nme.6908 http://www.optimization-online.org/DB_HTML/2020/08/7986.html

64. ⋆⋆ **H. Antil**, T.S. Brown, R. Khatri, A. Onwunta, D. Verma, and M. Warma. Optimal Control, Numerics, and Applications of Fractional PDEs. Handbook of Numerical Analysis 2022. https://doi.org/10.1016/bs.hna.2021.12.003

65. Löhner, R., **Antil, H.**, Srinivasan, A. et al. High-Fidelity Simulation of Pathogen Propagation, Transmission and Mitigation in the Built Environment. Arch Computat Methods Eng 28, 4237–4262 (2021). DOI: https://doi.org/10.1007/s11831-021-09606-6

66. ⋆⋆ Brown, T.S., **Antil, H.**, Löhner, R., Togashi, F., Verma, D. (2021). Novel DNNs for Stiff ODEs with Applications to Chemically Reacting Flows. In: Jagode, H., Anzt, H., Ltaief, H., Luszczek, P. (eds) High Performance Computing. ISC High Performance 2021. Lecture Notes in Computer Science, vol 12761. Springer, Cham. https://doi.org/10.1007/978-3-030-90539-2_2

67. **H. Antil**, P. Dondl, and L. Striet. Approximation of Integral Fractional Laplacian and Fractional PDEs via sinc-Basis. SIAM J. of Sci. Computing, Vol. 43, No. 4, pp. A2897-A2922, 2021. DOI: https://doi.org/10.1137/20M1374122

68. **H. Antil**, T. Berry, and J. Harlim. Fractional Diffusion Maps. Applied and Computational Harmonic Analysis (ACHA). Volume 54, September 2021, Pages 145-175. DOI: https://doi.org/10.1016/j.acha.2021.03.005

69. **H. Antil**, C.N. Rautenberg, A. Schikorra. On a Fractional Version of a Murat Compactness Result and Applications. SIAM Journal of Mathematical Analysis, 53(2021), no.3, 3158–3187. DOI: https://doi.org/10.1137/20M1379873

70. C. Glusa, **H. Antil**, M. D'Elia, B. van Bloemen Waanders, and C.J. Weiss. A fast solver for the fractional Helmholtz equation. SIAM Journal of Scientific Computing, 43(2021), no.2, A1362–A1388 https://doi.org/10.1137/19M1302351

71. ⋆⋆ **H. Antil**, D.P. Kouri, and J. Pfefferer. Risk-Averse Control of Fractional Diffusion with Uncertain Exponent. SIAM Journal of Control and Optimization, 59(2021), no.2, 1161–1187. DOI: 10.1137/20M1324958

72. H. Dinh, **H. Antil**, Y. Chen, E. Cherkaev, and A. Narayan. Model reduction for fractional elliptic problems using Kato's formula. Math. Control Relat. Fields 12 (2022), no.1, 115–146. DOI: 10.3934/mcrf.2021004

73. ⋆⋆ **H. Antil**, A. Drăgănescu, K. Green. A Note on Multigrid Preconditioning for Fractional PDE-Constrained Optimization Problems. Results Appl. Math.9(2021), Paper No. 100133, 9 pp. DOI: 10.1016/j.rinam.2020.100133

74. R. Löhner, **H. Antil**, H.R. Tamaddon-Jahromi, N.K. Chakshu, P. Nithiarasu. Deep Learning or Interpolation for Inverse Modeling of Heat and Fluid Flow Problems ? International Journal of Numerical Methods for Heat and Fluid Flow, Vol. 31 No. 9, 2021 pp. 3036-3046. DOI: 10.1108/HFF-11-2020-0684

75. R. Löhner and **H. Antil**. High Fidelity Modeling of Aerosol Pathogen Propagation in Built Environments with Moving Pedestrians. International Journal for Numerical Methods in Biomedical Engineering, 2020. DOI: https://doi.org/10.1002/cnm.3428

    The topmost downloaded and cited article 2021-2022.

76. R. Löhner, **H. Antil**, S. Idelsohn, E. Oñate. Detailed Simulation of Viral Propagation in Built Environment. Computational Mechanics. 2020. https://doi.org/10.1007/s00466-020-01881-7

77. ⋆⋆**H. Antil**, R. Khatri, R. Löhner, and D. Verma. Fractional Deep Neural Network via Constrained Optimization. Machine Learning: Science and Technology, 2020. DOI: https://doi.org/10.1088/2632-2153/aba8e7

78. **H. Antil**, S. Kubota, K. Shirakawa, and N. Yamazaki. Optimal control problems governed by 1–D Kobayashi Warren-Carter Type Systems. Mathematical Control & Related Fields 2020. DOI: http://dx.doi.org/10.3934/mcrf.2020036

79. ⋆⋆ **H. Antil**, D. Verma, and M. Warma. Optimal control of fractional elliptic PDEs with state constraints and characterization of the dual of fractional order Sobolev spaces. Journal of Optimization Theory and Applications (JOTA), 2020. **DOI:** 10.1007/s10957-020-01684-z.

80. ⋆⋆ **H. Antil**, Z. Di, and R. Khatri. Bilevel optimization, deep learning and fractional Laplacian with applications in tomography. Inverse Problems **36**(6) 2020. 10.1088/1361-6420/ab80d7

81. R. Löhner and **H. Antil**. Determination of volumetric material data from boundary measurements: Revisiting Calderon's Problem. International Journal of Numerical Methods for Heat and Fluid Flow. 2020. **DOI:** https://doi.org/10.1108/HFF-12-2019-0931.

82. ⋆⋆ **H. Antil**, D. Verma, and M. Warma. External optimal control of fractional parabolic PDEs. ESAIM: Control, Optimization and Calculus of Variations (CoCV), Volume: **26**. Article Number: 20, Pages: 33, Year: 2020. DOI: https://doi.org/10.1051/cocv/2020005

83. C.J. Weiss, B.G. van Bloemen Waanders, and **H. Antil**. Fractional Operators Applied to Geophysical Electromagnetics. Geophysical Journal International, **220**(2), 1242-1259, 2020. DOI: https://doi.org/10.1093/gji/ggz516

84. **H. Antil** and M. Warma. *Optimal control of fractional semilinear PDEs.* ESAIM: Control, Optimisation and Calculus of Variations (ESAIM: COCV), Volume: **26**, Article Number : 5, Pages: 30, 2020. DOI: https://doi.org/10.1051/cocv/2019003

85. **H. Antil**, Y. Chen, A. Narayan. Reduced basis methods for fractional Laplace equations via extension. SIAM Journal of Scientific Computing **41**(6), pp. A3552-A3575, 2019. 10.1137/18M1204802

86. ⋆⋆ **H. Antil**, T. Brown, and F.J. Sayas. *A problem in control of elastodynamics with piezoelectric effects.* IMA Journal of Numerical Analysis. DOI: https://doi.org/10.1093/imanum/drz047. 2019.

87. **H. Antil** and C.N. Rautenberg. Sobolev spaces with non-Muckenhoupt weights, fractional elliptic operators, and applications. SIAM Journal on Mathematical Analysis **51**(3), 2479–2503, 2019. DOI: 10.1137/18M1224970

88. ⋆⋆ **H. Antil**, R. Khatri, and M. Warma. External optimal control of fractional PDEs. Inverse Problems, **35** 084003 (35pp), 2019. DOI: https://doi.org/10.1088/1361-6420/ab1299

89. **H. Antil** and M. Warma. *Optimal control of the coefficient for regional fractional p-Laplace equation: Approximation and convergence.* Mathematical Control & Related Fields, **9**(1), 1–38, 2019. DOI: 10.3934/mcrf.2019001

    The topmost downloaded article, three years in a row 2018-20.

90. A. Hazra, V. Maggioni, P. Houser, **H. Antil**, M. Noonan. A monte carlo-based multi-objective optimization approach to merge different precipitation estimates for land surface modeling. Journal of Hydrology, **570**, 2019, pp. 454–462. https://doi.org/10.1016/j.jhydrol.2018.12.039

91. **H. Antil**, K. Shirakawa, and N. Yamazaki. A class of parabolic systems associated with optimal control of grain boundary motions. Advances in Mathematical Sciences and Applications, **27**(2) 2018, pp. 299–336.

92. ⋆⋆ **H. Antil**, J. Pfefferer, and S. Rogovs. *Fractional operators with inhomogeneous boundary conditions: analysis, control, and discretization.* Communications in Mathematical Sciences (CMS) **16**(5), 1395–1426, 2018. DOI: 10.4310/CMS.2018.v16.n5.a11

93. ⋆⋆ **H. Antil**, R. H. Nochetto and P. Venegas. *Controlling the Kelvin force: Basic Strategies and Applications to Magnetic Drug Targeting.* Optimization and Engineering, **19**(3), 559–589, 2018. https://doi.org/10.1007/s11081-018-9392-7

94. ⋆⋆ **H. Antil**, D. Chen, and S. E. Field. *A Note on QR-Based Model Reduction: Algorithm, Software, and Gravitational Wave Applications.* Computing in Science and Engineering **20**(10), 2018. 10.1109/MCSE.2018.042781323

95. ⋆⋆ **H. Antil**, E. Otarola, and A. J. Salgado. *Optimization with respect to order in a fractional diffusion model: analysis, approximation and algorithmic aspects.* http://rdcu.be/J6Hz. Journal of Scientific Computing **77**(1), 204–224, 2018. DOI: https://doi.org/10.1007/s10915-018-0703-0

96. **H. Antil** and M. Warma. *Optimal control of the coefficient for fractional p-Laplace equation: Approximation and convergence.* RIMS Kôkyûroku, **2090**, 102–116, 2018. http://hdl.handle.net/2433/251624

97. **H. Antil** and D. Leykekhman. *A brief introduction to PDE constrained optimization.* Editor. H. Antil and D. P. Kouri and M. D. Lacasse and D. Ridzal. Book title: Frontiers in PDE-Constrained Optimization, Springer. pp. 3–40, 2018. DOI: https://doi.org/10.1007/978-1-4939-8636-1_1

    Code: https://bitbucket.org/harbirantil/pde_constrained_opt

98. **H. Antil** and C. N. Rautenberg. Fractional elliptic quasi-variational inequalities: theory and numerics. Interface and Free Boundaries, **20**(1), 1–24, 2018. DOI: 10.4171/IFB/395

99. ⋆⋆ **H. Antil**, R. H. Nochetto and P. Venegas. *Optimizing the Kelvin Force in a Moving Target Subdomain.* Math. Models Methods Appl. Sci. **28**(1), 95–130, 2018. DOI: https://doi.org/10.1142/S0218202518500033

100. ⋆⋆ **H. Antil**, E. Otárola, and A. J. Salgado. *Some applications of weighted norm inequalities to the error analysis of PDE constrained optimization problems.* IMA Journal of Numerical Analysis, **38**(2), 852–883, 2018. DOI: https://doi.org/10.1093/imanum/drx018.

101. ⋆⋆ **H. Antil**, and E. Otárola. *An a posteriori error analysis for an optimal control problem involving the fractional Laplacian.* DOI: IMA Journal of Numerical Analysis, **38**(1), 198–226, 2018. https://doi.org/10.1093/imanum/drx005.

102. **H. Antil**, and S. W. Walker. *Optimal Control of a Degenerate PDE for Surface Shape.* Appl. Math. Optim. **78** (2), 297–328, 2018. DOI: https://doi.org/10.1007/s00245-017-9407-3

103. **H. Antil** and S. Bartels. *Spectral approximation of fractional PDEs in image processing and phase field modeling.* Computational Methods in Applied Mathematics **17**(4), 2017. DOI: https://doi.org/10.1515/cmam-2017-0039.

104. ⋆⋆ **H. Antil**, J. Pfefferer, and M. Warma. A note on semilinear fractional elliptic equation: analysis and discretization. Math. Model. Numer. Anal. (ESAIM: M2AN) **51**(6), 2017. DOI: https://doi.org/10.1051/m2an/2017023.

105. **H. Antil**, S. Hardesty, and M. Heinkenschloss. *Shape Optimization of Shell Structure Acoustics.* SIAM J. Control Optim. **55** (3), 1347–1376, 2017. DOI: https://doi.org/10.1137/16M1070633

    Supplementary Materials: Shape Optimization of Shell Structure Acoustics. 2017. Technical Report: http://www.caam.rice.edu/~heinken/papers/HAntil_SHardesty_MHeinkenschloss_2016b.pdf

106. **H. Antil**, M Hintermüller, R. H. Nochetto, T. M. Surowiec and D. Wegner. *Finite Horizon Model Predictive Control of Electrowetting on Dielectric with Pinning.* Interfaces Free Bound. **19** (1), 1–30, 2017. DOI: 10.4171/IFB/375

107. K. Carlberg, M. Barone, and **H. Antil**. *Galerkin v. discrete-optimal projection in nonlinear model reduction.* Journal of Computational Physics, **330**, 693-734, 2017. DOI: https://doi.org/10.1016/j.jcp.2016.10.033

108. ⋆⋆ **H. Antil**, E. Otárola, and A. J. Salgado. *A fractional space-time optimal control problem: analysis and discretization.* SIAM Journal of Control and Optimization, 54(3), 1295-1328, 2016. DOI: https://doi.org/10.1137/15M1014991

    Among 10 most read articles of 2016-17.

109. **H. Antil**, and A. J. Salgado. *Approximation of elliptic equations with BMO coefficients.* IMA Journal of Numerical Analysis, 36(1), 222-237, 2016. DOI: https://doi.org/10.1093/imanum/drv001

110. ⋆⋆ **H. Antil**, and E. Otárola. *A FEM for an optimal control problem of fractional powers of elliptic operators.* SIAM Journal of Control and Optimization, 53(6), 3432–3456, 2015. DOI: https://doi.org/10.1137/140975061

Among 10 most read articles of 2016-17.

111. ⋆⋆ **H. Antil**, R. H. Nochetto, and P. Sodré. *Optimal Control of a Free Boundary Problem with Surface Tension Effects: A Priori Error Analysis.* SIAM Journal of Numerical Analysis, **53**(5):2279–2306, 2015. https://doi.org/10.1137/140958360

112. ⋆⋆ **H. Antil**, R. H. Nochetto, and P. Sodré. *Optimal Control of a Free Boundary Problem: Analysis with Second Order Sufficient Conditions.* SIAM Journal of Control and Optimization, **52**(5):2771–2799, 2014. https://doi.org/10.1137/120893306

113. **H. Antil**, M. Heinkenschloss, and D. C. Sorensen. *Application of Discrete Empirical Interpolation Method to Reduced Order Modeling of Nonlinear and Parametric Systems.* A. Quarteroni and G. Rozzas (eds.), Reduced Order Methods for Modeling and Computational Reduction, Model. Simul.& Appl. Vol. 9, 2014, pp. 101-136, Springer Italia, Milan. DOI: https://doi.org/10.1007/978-3-319-02090-7_4

114. **H. Antil**, S. Field, F. Herrmann, R. H. Nochetto, and M. Tiglio. *Two-step Greedy Algorithm for Reduced Order Quadratures (ROQ).* Journal of Scientific Computing, Springer, **57**:604–637, 2013. DOI: https://doi.org/10.1007/s10915-013-9722-z

- **ROQ is now part of LIGO analysis code** https://www.lsc-group.phys.uwm.edu/daswg/docs/howto/lal-install.html
- **ROQ is now part of** FINESSE **software package used at LIGO** http://arxiv.org/abs/1507.03806**.**

115. **H. Antil**, M. Heinkenschloss, R.H.W. Hoppe, C. Linsenmann, and A. Wixforth. *Reduced Order Modeling Based Shape Optimization of Surface Acoustic Wave Driven Microfluidic Biochips.* Mathematics and Computers in Simulation, **82**:1986-2003, 2012. DOI: https://doi.org/10.1016/j.matcom.2010.10.027

116. **H. Antil**, R.H.W. Hoppe, C. Linsenmann, and A. Wixforth. *Multiscale Aspects in Modeling and Simulation of Surface Acoustic Wave Driven Microfluidic Biochips.* E-Book Series: Progress in Computational Physics (PiCP), Volume 2, Bentham Science Publishers, 2011. DOI: 10.2174/978160805254711202010104

117. **H. Antil**, M. Heinkenschloss, and R.H.W. Hoppe. *Domain Decomposition and Balanced Truncation Model Reduction for Shape Optimization of the Stokes System.* Optimization Methods and Software, **26**:643-669, 2011. DOI: https://doi.org/10.1080/10556781003767904

Most cited article in this journal. Years 2012-13.

118. **H. Antil**, M. Heinkenschloss, R.H.W. Hoppe, and D.C. Sorensen. *Domain Decomposition and Model Reduction for the Numerical Solution of PDE Constrained Optimization Problems with Localized Optimization Variables.* Computing and Visualization in Science, **13**(6):249-264, 2010. DOI: https://doi.org/10.1007/s00791-010-0142-4

119. **H. Antil**, R. Glowinski, R.H.W. Hoppe, C. Linsenmann, T.-W. Pan, and A. Wixforth. *Modeling, Simulation, and Optimization of Surface Acoustic Wave Driven Microfluidic Biochips.* Journal of Computational Mathematics, **28**(2):149-169, 2010. DOI: 10.4208/jcm.2009.10-m1001

120. **H. Antil**, R.H.W. Hoppe, and C. Linsenmann. *Adaptive Multilevel Interior Point Methods in PDE Constrained Optimization.* Proc. Int. Conf. on Domain Decomposition Methods and Applications XVIII (Bercovier, M. et al.; eds.), Lecture Notes in Computational Science and Engineering, **70**:15–26, Springer, Berlin Heidelberg-New York, 2009. https://doi.org/10.1007/978-3-642-02677-5_2

121. **H. Antil**, R.H.W. Hoppe, and C. Linsenmann. *Optimal Design of Stationary Flow Problems by Path-following Interior Point Methods.* Control and Cybernetics, **37**(4):771–796, 2008.

122. **H. Antil**, R.H.W. Hoppe, and C. Linsenmann. *Adaptive Path-following Primal-Dual Interior Point Methods for Shape Optimization of Linear and Nonlinear Stokes Flow Problems.* Lecture Notes in Computer Science, **4818**:259-266, Springer, Berlin-Heidelberg-New York, 2008. DOI: `https://doi.org/10.1007/978-3-540-78827-0_28`

123. **H. Antil**, A. Gantner, R.H.W. Hoppe, D. Köster, K.G. Siebert and A. Wixforth. *Modeling and Simulation of Piezoelectrically Agitated Acoustic Streaming on Microfluidic Biochips.* Proc. Int. Conf. on Domain Decomposition Methods and Applications XVII (Langer, U. et al.; eds.), Lecture Notes in Computational Science and Engineering, **60**:305–312, Springer, Berlin Heidelberg-New York, 2008. DOI: `https://doi.org/10.1007/978-3-540-75199-1_36`

124. **H. Antil**, R.H.W. Hoppe, and C. Linsenmann. *Path-following Primal-Dual Interior Point Methods for Shape Optimization of Stationary Flow Problems.* Journal of Numerical Mathematics, **15**(2):81–100, 2007. DOI: `https://doi.org/10.1515/jnma.2007.005`

Peer Reviewed Proceedings

125. T. Ansari, S. Warnakulasuriya, R. Wüchner, K.U. Beltzinger, I. Antonau, R. Löhner, , and **H. Antil**, and F. Airaudo. Adjoint-based System Identification for Model Validation and Qualification. To appear in Proceedings of 9th Structural Engineering, Mechanics, and Computation (2025).

126. I. Antonau, S. Warnakulasuriya, T. Ansari, R. Wuechner, R. Loehner, F. Airaudo, and H. Antil. Advancing high-fidelity digital Twin Technology for Structural Health Monitoring. To appear in Proceedings of Structural Health Monitoring of Intelligent Infrastructure (2025). Verlag der TU Graz.

127. R. Löhner, **H. Antil**, S. Schöps. On Techniques for Barely Coupled Multiphysics. AIAA 2025-0576 (2025). DOI: 10.2514/6.2025-0576

128. ⋆⋆ R. Löhner, F. Airaudo, **H. Antil**, R. Wuechner, S. Warnakulasuriya, I. Antonau and T. Ansari. High-Fidelity Digital Twins: Zooming in on Weakness in Structures. AIAA 2025-0286 (2025). DOI: 10.2514/6.2025-0286

129. ⋆⋆ I. Antonau, S. Warnakulasuriya, R. Wuechner, R. Loehner, F. Airaudo, **H. Antil**, and T. Ansari. Comparison of the First Order Algorithms to Solve System Identification Problems of High-Fidelity Digital Twins. AIAA 2025-0285 (2025). DOI: 10.2514/6.2025-0285

130. ⋆⋆ F. Airaudo, **H. Antil**, R. Löhner, and U. Rakhimov. On the Use of Risk Measures in Digital Twins to Identify Weaknesses in Structures. AIAA 2024-2622 (2024). DOI: 10.2514/6.2024-2622. *Preprint:* `https://arxiv.org/pdf/2311.12206.pdf`

131. ⋆⋆ R. Löhner, F. Airaudo, **H. Antil**, R. Wüchner, F. Meister, S. Warnakulasuriya. High-Fidelity Digital Twins: Detecting and Localizing Weaknesses in Structures. AIAA 2024-2621 (2024). DOI: 10.2514/6.2024-2621 *Preprint:* `https://arxiv.org/pdf/2311.10925.pdf`

132. ⋆⋆R. Baraldi, E. Herberg, D.P. Kouri, and **H. Antil**. Adaptive Randomized Sketching for Dynamic Nonsmooth Optimization. In: Platz, R., Flynn, G., Neal, K., Ouellette, S. (eds) Model Validation and Uncertainty Quantification, Volume 3. SEM 2023. Conference Proceedings of the Society for Experimental Mechanics Series. Springer, Cham. DOI: `https://doi.org/10.1007/978-3-031-37003-8_17`

133. ⋆⋆ T.S. Brown, **H. Antil**, R. Löhner, D. Verma and F. Togashi. Parallel Deep ResNets for Chemically Reacting Flows. AIAA SciTech Forum 2022-1076. 2022. DOI: `https://doi.org/10.2514/6.2022-1076`

134. R. Löhner, **H. Antil**, J.R. Cebral, and F. Mut. Adjoint-based Estimation of Sensitivity of Clinical Measures to Boundary Conditions for Arteries. In 7th International Conference on Computational and Mathematical Biomedical Engineering - CMBE2021. 27–29 June 2022, Italy

Non Peer Reviewed Articles

135. **H. Antil** and R. Löhner. High-fidelity Digital Twins. SIAM News, May 2025. `https://www.siam.org/publications/siam-news/articles/high-fidelity-digital-twins`
136. **H. Antil** and Ratna Khatri. A Successful Revival of the SIAM Washington-Baltimore Section. SIAM News, Volume 56, Issue 1 January/February 2023. `https://tinyurl.com/2dncj4bn`
137. H. Antil, S. Bartels, and A. Schikorra. Fractional Harmonic Maps. Approximation and Convergence. Mathematisches Forschungsinstitut Oberwolfach (2022). Report No. 2206. DoI: DOI: 10.14760/OWR-2-22-6
138. R. Löhner and **H. Antil**. High-Fidelity Simulation of Pathogen Propagation, Transmission, and Mitigation. SIAM News , 54, 6, July/August (2021).
`https://tinyurl.com/2p83cfyz`
139. **H. Antil.** Role of Fractional Operators in Inverse Problems. Mathematisches Forschungsinstitut Oberwolfach (2020). Report No. 39/2020. DoI: DOI: 10.4171/OWR/2020/39
140. **H. Antil.** Fractional Operators: Analysis, Control, and Applications. Mathematisches Forschungsinstitut Oberwolfach (2020). Report No. 37/2020. DoI: DOI: 10.4171/OWR/2020/37
141. ⋆⋆ **H. Antil** and J. Pfefferer. A short Matlab implementation of fractional Poisson equation with nonzero boundary conditions. Technical report 2017.

    Report: `http://math.gmu.edu/~hantil/Tech_Report/HAntil_JPfefferer_2017a.pdf`

    Code: `https://bitbucket.org/harbirantil/frac_poisson_nhbc/`
142. **H. Antil** and C. N. Rautenberg. A Numerical Method for Fractional Elliptic Quasi-Variational Inequalities. `https://www.mfo.de/document/1704/preliminary_OWR_2017_06.pdf`. Mathematisches Forschungsinstitut Oberwolfach, Report, 2017.
143. ⋆⋆ **H. Antil**, R. H. Nochetto, and P. Sodré. *The Stokes problem with Navier slip boundary condition: Minimal fractional Sobolev Regularity of the domain.* `http://arxiv.org/abs/1512.07936v1`. Technical Report. 2015.
144. **H. Antil**. *Optimal Control of a Free Boundary Problem with Surface Tension Effects.* Mathematisches Forschungsinstitut Oberwolfach, Report No. 57/2012, DOI: 10.4171/OWR/2012/57. `http://www.mfo.de/occasion/1248c/www_view`
145. **H. Antil**. *Shape Optimization Governed by the Heat and the Stokes Equations Using Domain Decomposition and Model Reduction.* Mathematisches Forschungsinstitut Oberwolfach, Report No. 04/2009, DOI: 10.4171/OWR/2009/04. `http://www.mfo.de/occasion/0905/www_view`

Others

146. **H. Antil**. *Optimization and Model Reduction of Time Dependent PDE-Constrained Optimization Problems: Applications to Acoustic Wave Driven Microfluidic Biochips.* PhD Dissertation, Department of Mathematics, University of Houston, 2009. `http://search.proquest.com/docview/250928958`

Advising

Postdoctoral Researchers

1. Sarswati Shah (January 2025 - current)
2. Keegan Kirk (September 2024 - current)
3. Rohit Khandelwal (August 2023 - September 2025); currently (TT) Assistant Professor at South Asian University, India.
4. Sean Carney (July 2023 - July 2024); currently (TT) Assistant Professor at Union College, NY.
5. Madhu Gupta (September 2022 - August 2023); currently (TT) Assistant Professor at IIT Gandhinagar.
6. Randy Price (September 2021 - May 2023); currently a research scientist at US Naval Research Lab Washington DC.
7. Evelyn Herberg (August 2021 - August 2022); currently at Heidelberg University, Germany.
8. Akwum Onwunta (August 2020 - August 2021); currently (TT) Assistant Professor at Lehigh University.
9. Thomas Brown (May 2019 - July 2021); currently (TT) Assistant Professor at Virginia State University.
10. Johannes Pfefferer (October - December 2015); currently at Technical University, Munich, Germany.
11. Pablo Venegas (August 2015 - January 2016); currently a Professor at University of Bio Bio, Chile.
12. Enrique Otarola (15 August 2014 - 15 June 2015); currently a Professor at Santa Maria University, Santiago, Chile.

PhD Students

1. Aryan Saxena (July 2025 – present)
2. Felipe Perez (August 2024 – present)
3. Animesh Jain (January 2025 – present)
4. Umarkhon Rakhimov (August 2024 – present)
5. Daniel Blauvelt (August 2024 – present; Fellowship from MITRE to conduct research at University; Ph.D. research has been selected for DoD research highlight).
6. Yaw Owusu-Agyemang (Ph.D. January 2024 – present; Internships at Sandia National Labs – Summer 2025 and 2025).
7. Facundo Airaudo (Ph.D. May 2025, directed jointly with Rainald Löhner (Physics); position after graduation: Postdoc at Los Alamos National Lab; Institute of Digital Innovation Fellowship; Ph.D. research appeared as NSF research highlight).
8. Kiefer Green (Ph.D. August 2024; position after graduation: Postdoc at George Mason University; honorable mention in DOE iBUILD fellowship).
9. David Sayre (Ph.D. August 2023; position after graduation: Research Scientist at Naval Surface Warfare Center, Virginia; DoD Fellow to conduct research at University, Ph.D. dissertation was DoD research highlight for two years in a row).
10. Mohammed Alshehri (Ph.D. August 2023; currently (TT) Assistant Professor at Najran University, Saudi Arabia).
11. Hugo Díaz (Ph.D. May 2023; position after graduation: postdoc at NC State; best dissertation award).
12. Deepanshu Verma (Ph.D. August 2021; currently (TT) Assistant Professor at Clemson University, SC; Distinguished Visiting Assistant Professor at Emory University; Presidential Fellowship and Dean's Research Excellence Award (GMU)).
13. Mahendra Panagoda (Ph.D. August 2021, directed jointly with Tyrus Berry (GMU); position after graduation: Actuarial at ACTEX Learning).

14. Ratna Khatri (Ph.D. May 2020; currently Principal Research Scientist at US Naval Research Lab, DC; Givens Fellow at Argonne National Lab).
15. Patrick Sodré (Ph.D. May 2013, directed jointly with Ricardo H. Nochetto (Maryland); position after graduation: Principal Scientist at Intelligent Automation, Inc.).

Other Ph.D. students

1. Anna Lentz: Visiting student from Wüerzburg, Germany (2025)
2. Alonso Javier Bustos Barría: Visiting student from Concepcion, Chile (2025)
3. Benjamín Venegas: Visiting student from Concepcion, Chile (2025)
4. Madeline Horton: PhD from 2022-23, jointly with Mahamadi Warma
5. Ludwig Striet: (PhD) Visiting Student from Freiburg, Germany
6. A.J. Bailey: (PhD) Summer 2021, jointly with Mahamadi Warma
7. Tianyi Shi Visiting Ph.D. student from Cornell University (Summer 2019)

MS Students

1. John Maxwell: MS Math (May 2021). *Title:* Diametrical Risk Minimization.
   First Position: Research Scientist at Institute for Defense Analyses (IDA).
2. Igor Semyonov: MS Math (December 2019).
   First Position: Research Scientist at Army Night Vision Lab.
3. Dennis Marti: MS-Math (May 2019).
   First Position: Data Scientist at Verizon.
4. Justin Thorpe: MS-Math (May 2018).
   First Job: PhD student Department of Mathematical Sciences, GMU.
5. Tuan Le: MS-Math (December 2017). *Title:* PDE Constrained Optimization under Uncertainty
   First Job: PhD student at Systems Engineering and Operations Research, GMU

Undergraduate Students

1. Sital Paudel: August 2024–2025
2. Shrunal Pothagoni: CMAI Summer Intern (May 2022 - August 2022)
   First Position: Math PhD student at GMU.
3. Brendan Gramp: Extreems, George Mason University (May 2018 - May 2019)
   First Position: Math PhD student at University of Maryland, College Park.
4. Lucas C. Bouck: Extreems, George Mason University (December 2015 - May 2018).
   2018 NSF GRFP Fellow (most prestigious NSF Graduate Fellowship)
   2017 Goldwater Honorable Mentions
   First Position: Math PhD student at University of Maryland, College Park.
5. Mae Markowski: Extreems, George Mason University (May 2015 - current).
   First Position: Applied Math PhD student at Rice University.
   Honorable mention in NSF-GRFP (most prestigious NSF Graduate Fellowship).
6. Dangxing Chen: REU Summer 2013, George Mason University.
   First Position: Math PhD student at University of North Carolina at Chapel Hill.
   Currently a tenure-track faculty at Duke Kunshan University.

PhD Dissertation Committee

Current

Alex Sheranko (Math), University of Maryland, Baltimore County.
Mike Retzlaff (Math), University of Maryland, Baltimore County.

Past

Julia Huschens, University of Trier, Germany
Matthias Schuster, University of Trier, Germany
Eric Winter (Physics), George Mason University, Fairfax
Hedwig Keller (Math), University of Freiburg, Germany
Sumaya Alzuhairy (Math), University of Maryland, Baltimore County.
Rafael Arndt (Math), George Mason University, Fairfax
Dharmendra Kumar (Math), Indian Institute of Technology (IIT), Gandhinagar, India
Jeff Snider (Math), George Mason University, Fairfax.
Stephen Wheatley (Math), George Mason University, Fairfax.
Diego Torrejon (Math), George Mason University, Fairfax.
Sergejs Rogovs (Math), University of Bundeswehr Munich, Germany.
James Cameron (Math), George Mason University, Fairfax.
Mona Hajghassem (Math), University of Maryland, Baltimore County.
Patrick Sodré (Math), University of Maryland, College Park.
Patrick O'Neil (Math), George Mason University, Fairfax.
Jyoti Saraswat (Math), University of Maryland, Baltimore County.
Maziar Raissi (Math), George Mason University, Fairfax.

Research Talks

2026

1. **Plenary speaker** at Joint Math Meetings (JMM), Washington, D.C. January 4-7, 2026.

2025

2. **Plenary speaker** at Fourth Triangle Computational and Applied Mathematics Symposium (Tri-CAMS), jointly organized by Duke University, NC State, UNC Chapel Hill and North Carolina Central University. November 8 - 9, 2025.
3. **Plenary speaker** at "Workshop on Advances in Computational Mathematics with Machine Learning", Institute of Computational Data Sciences (ICDS) at Penn State University. October 6, 2025.
4. **Plenary speaker** at "Mathematical and Computational Foundations of Digital Twins", Centre International de Rencontres Mathématiques (CIRM), Marseille, France. August 11-15, 2025.
5. Minisymposium speaker at International Conference on Continuous Optimization (ICCOPT). July 19-24, 2025. University of Southern California, California.
6. **Keynote speaker** at summer school on "Optimisation for Deep Learning", Malaviya National Institute of Technology, Jaipur, India.
7. Minisymposium speaker at INFORMS Applied Probability Society Conference at GeorgiaTech, Atlanta. June 30 - July 3, 2025.
8. **Eminent Plenary speaker** at International SPARC Workshop on "Computational and AI-Driven Multi-Physics Simulation in Porous Media (CAIMS-Poro-2025)", 16-20 June, 2025. Defence Institute of Advanced Technology (DIAT), Pune, India.

9. **Plenary speaker** at Workshop Nonlinear Bending II. University of Freiburg, Freiburg, Germany. May 26-28, 2025. July 2, 2025.
10. **Panelist** at the NSF Computational Math PI Meeting in the session "Future Directions of Comp-Math: Research and Education", University of Utah. May 8-9, 2025.
11. Speaker at the NSF Computational Math PI Meeting, University of Utah. May 8-9, 2025.
12. **Keynote speaker** at 7th Annual Montgomery College STEM Undergraduate Research Conference. Maryland, May 19, 2025.
13. **Plenary speaker** at Löhner Fest. Technical University Braunschweig, Germany. April 8, 2025.
14. Colloquium in Computational and Applied Mathematics speaker at University of Chicago. March 27, 2025.
15. Colloquium, Department of Mathematics, Georgetown University. March 21, 2025.
16. **Plenary (industry)** at Clarifai. Washington DC. March 20, 2025.
17. **Plenary speaker** "AI in the New Administration: The Future of the CAIO". The event is organized by the Media Company: Government Executive. March 19, 2025. `https://events.nextgov.com/future-of-the-caio/`
18. Minisymposium speaker at SIAM Conference on Computational Science and Engineering (CSE25). March 3-7, 2025. Fort Worth, Texas, U.S.
19. **Mason Science Series** speaker. Hosted by the Dean of College of Science, George Mason University. February 26, 2025.
20. **Plenary speaker** at AI In The C-SUITE: The Role of the CIAO. The event is organized by the Media Company: Government Executive. February 20, 2025. `https://events.nextgov.com/ai-in-the-c-suite/`
21. Seminar speaker at Systems Engineering and Operations Research (SEOR) Department, GMU. February 17, 2025.
22. Control and Optimization Seminar at LSU. January 31, 2025.
23. Invited speaker at ICERM (Brown University) workshop on Computational Learning for Model Reduction. January 6-10, 2025.

2024

24. **Plenary speaker** at the **Capitol Hill** organized by CTeL on December 9, 2024.
25. **Plenary speaker** at the International Conference on Scientific Machine Learning. The University of Hong Kong (HKU). December 2-4, 2024.
26. Colloquium speaker at Morgan State University. October 24, 2024.
27. Finite Element Circus. University of Maryland, Baltimore County. Oct 18-19, 2024
28. Naval Surface Warfare Center Tech Talk on September 24, 2024.
29. **Distinguished plenary speaker** Modeling and Optimization: Theory and Applications (MOPTA) 2024 conference. August 14-16, 2024.
30. Minisymposium speaker at The International Symposium on Optimization (ISMP), Montreal Canada. July 21-26, 2024.
31. **Panelist** at the NSF Computational Math PI Meeting, Seattle, WA. July 15-16, 2024.
32. Speaker at the NSF Computational Math PI Meeting, Seattle, WA. July 15-16, 2024.

33. **Summer School** teacher on Optimization Under Uncertainty at EPFL, Lausanne, Switzerland. June 11-14, 2024.
34. Minisymposium speaker at Mathematical Aspects of Materials Science 2024 (MS24). Pittsburgh. May 19-23, 2024.
35. Invited speaker at GMU and Naval Surface Warfare Center Symposium. May 2, 2024.
36. Minisymposium speaker 'Mathematical Opportunities in Digital Twins' at AMS Spring Eastern Sectional Meeting, Washington DC. April 6-7, 2024.
37. Minisymposium speaker 'Machine Learning and Inverse Problems' at AMS Spring Eastern Sectional Meeting, Washington DC. April 6-7, 2024.
38. Speaker at Computational Mathematics and Scientific Computing (CMSC) Seminar. Courant Institute, NYU. March 16, 2024.
39. **Keynote speaker** at International Conference on Computations and Data Science (CoDS-2024), IIT Roorkee, India. March 08-10, 2024
40. Colloquium speaker at ODEN Institute, UT Austin. January 18, 2024.
41. Colloquium speaker at University of Pittsburgh, Pittsburgh. January 9, 2024.

2023

42. Speaker at Numerical Analysis Seminar at The University of Hong Kong (HKU). November 18, 2023.
43. Invited speaker at workshop on Crosscutting Research Needs for Digital Twins. Santa Fe Institute in Santa Fe, NM. October 11-12, 2023.
44. The Mathematics in Computation (MiC) Seminar speaker at Oak Ridge National Lab. September 14, 2023.
45. Colloquium at United States Naval Academy, Annapolis, Maryland. September 14, 2013.
46. Pitt Mathematics-Naval Nuclear Laboratory Joint Seminar. University of Pittsburgh, September 12, 2023.
47. Speaker at Air Force Office of Scientific Research (AFOSR) annual program review. August 28-30, Arlington VA.
48. Minisymposium speaker at International Congress on Industrial and Applied Mathematics. Tokyo, Japan. August 21, 2023.
49. Minisymposium speaker at SIAM Conference on Optimization. May 30-June 2, 2023. Seattle, WA.
50. Optimization in Oslo (OiO) Seminar speaker. Simula Research Laboratory, Oslo, Norway. May 24, 2023.
51. Numerical Analysis of Galerkin ROMs (NA G-ROMs) seminar speaker. April 11, 2023. `https://na-g-roms.github.io/index.html`
52. Advanced Modeling & Simulations seminar at the University of Texas at El Paso. March 10, 2023.
53. Colloquium Speaker at Department of Computational Mathematics, Science and Engineering. Michigan State University. February 28, 2023.
54. Numerical Analysis Seminar at University of Maryland, College Park. January 31, 2023.
55. Stats and Data Science seminar, University of Tennessee, Knoxville. January 30, 2023.

2022

56. Variational Analysis and Optimization Seminar, University of Michigan, Ann Arbor. November 18, 2022.
57. Invited Seminar at Computer Science Department, George Mason University. November 9, 2022.
58. Invited talk 6th Annual DoD AI/ML TEM. October 18, 2022.
59. Center for Nonlinear Analysis (CNA) speaker at Carnegie Mellon University, Pittsburgh. September 29, 2022.
60. Speaker at LANS seminar series at Argonne National Laboratory. August 31, 2022.
61. Minisymposium speaker. The Seventh International Conference on Continuous Optimization (ICCOPT). Lehigh, PA. July 25-88, 2022.
62. Minisymposium speaker. SIAM Annual Meeting. Pittsburgh, PA. July 11-15, 2022.
63. **Banff International Research Station (BIRS)** workshop on Theoretical and Applied Aspects for Nonlocal Models. Banff International Research Station (BIRS) in Banff, Alberta July 17-22, 2022.
64. Minisymposium speaker at 7th IMA Conference on Numerical Linear Algebra and Optimization, University of Birmingham, UK. June 13, 2022.
65. Colloquium at Department of Mathematics, University of Tennessee. May 4, 2022.
66. Colloquium at Department of Applied Math, University of Notre Dame. April 13, 2022.
67. Colloquium at United States Naval Research Lab, Washington DC. April 19, 2022.
68. Minisymposium speaker at SIAM Conference on Imaging Science (IS22), March 21-25, 2022 (virtual).
69. **Mathematisches Forschungsinstitut Oberwolfach** conference on Space-Time Methods for Time-Dependent Partial Differential Equations. Oberwolfach, Germany. February 6-12, 2022.
70. Colloquium speaker at Department of Mathematics, Clemson University. January 26, 2022.
71. **Keynote speaker** on PDE Constrained Optimization and Machine Learning at MathWorks. January 18, 2022.
72. **Keynote speaker** at AIMS-Cameroon Mathematics and its Applications Meeting (ACMAM). January 12-14, 2022.

2021

73. Invited speaker at RAMSES: Reduced order models; Approximation theory; Machine learning; Surrogates, Emulators and Simulators. SISSA, International School for Advanced Studies, Main Campus, Trieste, Italy. 14-17 December, 2021.
74. Invited speaker at Center for Applied Scientific Computing (CASC) Colloquium. Lawerence Livermore National Lab. December 1, 2021.
75. Invited speaker in Applied and Computational Math Division (ACMD) Seminar Series, NIST, MD. November 9, 2021.
76. Finite Element Circus. Pennsylvania State University. November 5-6, 2021.
77. **Panelist and Invited speaker** under Panel on "Artificial Intelligence – Challenges and Controversies" at the Center for Intellectual Property x Innovation Policy Annual Conference, Anton Scalia Law School, GMU. October 13, 2021.
78. Minisymposium speaker at The 15th International Conference on Free Boundary Problems: Theory and Applications 2021. Berlin, Germany. September 13–September 17, 2021.
79. Data-Enabled Science Seminar speaker at University of Houston, Texas. September 3, 2021.

80. Inaugural speaker at the research cluster on Control Theory and Machine Learning at Southern Methodist University, Dallas Texas. September 2, 2021.
81. Minisymposium speaker at SIAM Conference on Optimization. Spokane, Washington. July 20-23, 2021.
82. **Plenary** talk at "RSS 2021 Workshop on Behavioral Inference of Remotely Sensed Multi-agent Systems". July 12-16, 2021. `https://sites.google.com/unizar.es/rss21-bi-mas/home?authuser=0`
83. **Plenary speaker** at Nonlocal Models: analysis, optimization and implementation. Trier University, Germany, July 12-16, 2021.
84. **Invited (plenary) speaker** at Workshop on Behavioral Inference of Remotely Sensed Multi-agent Systems at Robotics: Science and Systems. July 12-16, 2021.
85. **Plenary lecture** in international workshop "Analysis and Numerics of Design, Control and Inverse Problems" at Istituto Nazionale di Alta Matematica "Francesco Severi" (INdAM). Rome, Italy. June 28-July 2, 2021.
86. Data-driven Physical Simulation (DDPS) seminar at Lawerence Livermore National Lab. June 3, 2021.
87. Minisymposium speaker at SIAM Conference on the Mathematical Aspects of Materials Science (virtual participation). May 17 - 28, 2021.
88. Computational and Applied Mathematics Colloquium. Penn State University. April 19, 2021.
89. Minisymposium speaker at SIAM Conference on Computational Science and Engineering (virtual meeting). March 1-5, 2021.
90. Scientific Computing Seminar at Emory University. February 26, 2021.
91. Invited speaker at (virtual) Lisbon Webinar in Analysis in Differential Equations, a joint initiative between several institutes (including University of Lisbon) in Lisbon Portugal. February 11, 2021.

2020

92. **Mathematisches Forschungsinstitut Oberwolfach** conference on Computational Inverse Problems for Partial Differential Equations. Oberwolfach, Germany. December 6-12, 2020.
93. **Mathematisches Forschungsinstitut Oberwolfach** conference on Nonlocal Analysis and the Geometry of Embeddings. Oberwolfach, Germany. November 22-28, 2020.
94. **Plenary speaker** at workshop on Uncertainty Management and Machine Learning in Engineering Applications. Virtual meeting organized by Stonybrook University and Sandia National Labs. November 16-17, 2020.
95. Speaker at 50^{th} Finite Element (virtual) Circus. November 7-8, 2020.
96. CAA Online Seminar Series speaker. Department of Mathematics, Friedrich-Alexander-Universität Erlangen Nürenberg, Germany. November 4, 2020.
97. Scientific Computation Seminar speaker at the University of Nottingham, United Kingdom. October 14, 2020.
98. AIMS-Cameroon Research Center Colloquium speaker. September 22, 2020.
99. **Tutorial (1 hour).** 2020 SIAM/CIAM Annual Meeting. Toronto, Canada. July 6-10, 2020.
100. Minisymposium speaker. Numerical Methods for Fractional Calculus. SIAM/CIAM Annual Meeting. Toronto, Canada. July 6-10, 2020.

101. Minisymposium speaker. Advances in Variational Models and PDEs for Images. SIAM Conference on Imaging Science (IS20). July 6-9, 2020, Toronto, Canada.

102. Minisymposium speaker. Advances in regularization techniques for ill-posed problems. SIAM Conference on Imaging Science (IS20). July 6-9, 2020, Toronto, Canada.

103. Minisymposium speaker. Numerical Methods for Optimization Problems with PDE Constraints. International Conference on Computational Methods and Applications in Engineering (ICCMAE). Mississippi State University. May 7-9, 2020. Meeting cancelled due to COVID.

104. Minisymposium speaker. SIAM Conference on Optimization (OP20). The Hong Kong Polytechnic University, Hung Hom Campus, Hong Kong. May 26 - 29, 2020. Meeting postponed due to COVID.

105. Minisymposium speaker. Recent Advances in Adaptive Mesh Refinement and A Posteriori Error Estimation. AMS Spring Central Sectional Meeting at Purdue University. April 4-5, 2020. Meeting cancelled due to COVID.

106. **Winter School Teacher and Plenary speaker** at Workshop on Finite Elements for Nonlinear and Multiscale Problems. Indian Institute of Sciences (IISc), Bangalore, India. Feb 28 – Mar 03, 2020 `http://math.iisc.ernet.in/~gudi/FEM-Workshop.pdf`

107. Colloquium. Department of Mathematics and Statistics, University of Maryland Baltimore County. January 31, 2020.

2019

108. Invited speaker (45min **invited** talk) at Workshop on "Optimization and Inversion under Uncertainty", November 11-15, 2019, Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria.

109. Finite Element Circus. Department of Mathematics, Virginia Tech, November 1-2, 2019.

110. Invited speaker (45min **invited** talk) at Workshop on "Optimal Control and Optimization for Nonlocal Models", October 28-30, 2019, Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria.

111. Analysis seminar at Department of Mathematics, University of Pittsburgh. October 3, 2019.

112. Numerical analysis seminar speaker Department of Mathematics, University of Maryland, College Park. September 24, 2019.

113. Colloquium, Department of Mathematical Sciences, George Mason University. Fairfax, VA. September 20, 2019.

114. Invited talk at Air Force Office of Scientific Research annual meeting of Optimization program. August 22-23, 2019.

115. Minisymposium speaker. The Sixth International Conference on Continuous Optimization (ICCOPT). Berlin, Germany. August 5-8, 2019.

116. Colloquium speaker at BlackSky, Virginia. May 10, 2019.

117. Applied and Computational Math Seminar speaker. Rutgers University. April 26, 2019.

118. Numerical Analysis and Scientific Computing Seminar. Courant Institute, New York University (NYU). March 15, 2019.

119. Minisymposium speaker: Recent Advances in PDE-constrained Optimization under Uncertainty. SIAM CS & E. February 25 - March 1, 2019. Spokane, Washington.

120. Minisymposium speaker: Methods for Large-Scale Risk-Averse Optimization. SIAM CS & E. February 25 - March 1, 2019. Spokane, Washington.

121. Invited speaker at Francisco Javier-Sayas Fest at University of Delaware. February 16, 2018.

2018

122. Analysis and Differential Equations Colloquium speaker. University of Lisbon, Portugal, December 20, 2018.

123. 2018 American Geophysical Union meeting Washington D.C. 10-14 Dec 2018.

124. Semi-plenary Speaker at "Dynamics, Control and Numerics for Fractional PDEs", Puerto Rico, December 5-7, 2018.

125. Applied and Computational Math Seminar speaker at George Mason University, Fairfax, VA. November 16, 2018.

126. Finite Element Circus. Department of Mathematics, University of Delaware. November 9-10, 2018.

127. Speaker at Applied Interdisciplinary Mathematics (AIM) graduate student seminar. University of Michigan, Ann Arbor. October 26, 2018.

128. Speaker at Applied Interdisciplinary Mathematics (AIM) Seminar. University of Michigan, Ann Arbor. October 26, 2018.

129. SIAM Faculty Symposium, George Mason University, Fairfax VA. October 12, 2018.

130. Minisymposium speaker "Numerical approximation of fractional differential equations" at SIAM Texas-Louisiana Section, Louisiana State University, October 5-7, 2018.

131. Minisymposium speaker "Numerical Geometric PDE" at SIAM Texas-Louisiana Section, Louisiana State University, October 5-7, 2018.

132. **Plenary speaker** at DFG SPP 1962: Priority Programme on Non-smooth and Complementarity-based Distributed Parameter Systems: Simulation and Hierarchical Optimization. Berlin, Germany. October 1-3, 2018.

133. Speaker at COS-VSE lunch seminar. George Mason University. September 20, 2018.

134. Colloquium at United States Naval Academy, Annapolis, Maryland. September 14, 2018.

135. Applied Numerical Analysis Seminar speaker at Department of Mathematics, Virginia Tech. September 19, 2018.

136. Continuum Mechanics Seminar speaker at University of Nebraska-Lincoln. September 6, 2018.

137. Invited speaker at AFOSR Optimization and Discrete Math Program Review. Arlington, VA. August 23-24, 2018.

138. Colloquium at Naval Research Lab, Washington D.C. July 25, 2018.

139. Colloquium at Department of Mathematics, University of Freiburg. Freiburg, Germany. July 13, 2018.

140. Colloquium at Department of Mathematics, Technical University Munich, Germany. July 9, 2018.

141. Minisymposium speaker at The International Symposium on Optimization (ISMP) 2018. July 1-6, 2018, Bordeaux, France.

142. Minisymposium speaker at SIAM Conference on Imaging Science. June 5-8, 2018. Bologna, Italy.

143. Minisymposium speaker at SIAM Conference on Uncertainty Quantification. April 16-19, 2018. Garden Grove, California.

144. **Winter school organizer and teacher**. IIT Bombay, India. March 12-16, 2018.

145. COS-VSE Seminar Series speaker. George Mason University. March 23, 2018.

146. PDE and Topology Seminar speaker, University of Connecticut. February 05, 2018.

147. Applied and Computational Math Seminar speaker. George Mason University, February 02, 2018.

148. Computational and Applied Mathematics Colloquium. Penn State University. 08 Jan 2018.

149. Graduate student seminar. Penn State University. 08 Jan 2018.

2017

150. Invited speaker at workshop Modeling, Analysis and Numerics for Nonlocal Applications (MANNA). Santa Fe, NM Dec 11-15, 2017.

151. Invited speaker (software session) at workshop Modeling, Analysis and Numerics for Nonlocal Applications (MANNA). Santa Fe, NM Dec 11-15, 2017.

152. Numerical Analysis and PDE Seminar speaker, University of Delaware, December 7, 2017.

153. Applied and Computational Math Seminar. Rutgers University. December 1, 2017.

154. Colloquium speaker. Department of Mathematics, University of Nebraska-Lincoln, Lincoln, NE 68588. November 3, 2017.

155. Mechanics seminar speaker. Department of Mathematics, University of Nebraska-Lincoln, Lincoln, NE 68588. November 1, 2017.

156. **Keynote Speaker**. RIMS conference on Theory of Evolution Equations and Mathematical Analysis of Nonlinear Phenomena. Kyoto, Japan, October 18-20, 2017.

157. Mechanical Engineering and Materials Science (MEMS) Seminar Duke University. October 11, 2017.

158. **Summer school teacher.** Department of Mathematics, Technical University Munich, Germany. July 31-August 4, 2017. `http://www.igdk.eu/IGDK1754/CCAntil2017`

159. Minisymposium speaker: Mathematical Congress of Americas, Montreal, Canada. July 24-28, 2017.

160. Minisymposium speaker: Optimal control of fractional PDEs. SIAM Control and Optimization. July 10-12, 2017. Pittsburgh.

161. **Summer school teacher.** Mason Modeling Days, George Mason University, Fairfax, VA. June 28-July 1, 2017.

162. Minisymposium speaker: Optimization with PDEs: Theory and Numerics, SIAM Optimization. Vancouver, Canada. May 22-25, 2017.

163. Scientific Computing Seminar at Division of Applied Mathematics, Brown University. May 12, 2017.

164. Applied and Computational Math Seminar. George Mason University, Fairfax, VA. April 28, 2017.

165. Finite Element Circus. Rutgers University. April 21-22, 2017.

166. Minisymposium speaker: SIAM-SEAS, Florida State University, March 18-19, 2017.

167. Minisymposium speaker: Free-boundary Fluid Models and Related Problems. AMS Spring Southeastern Section Meeting. College of Charleston. Charleston, SC, March 10-12, 2017.

168. Minisymposium speaker: Recent Trends in Finite Element Methods. AMS Spring Southeastern Section Meeting. College of Charleston. Charleston, SC, March 10-12, 2017.

169. Minisymposium speaker: Stochastic PDE-Constrained Optimization and Applications. SIAM CS & E. February 27 - March 3, 2017. Atlanta, Georgia.

170. Differential equations seminar speaker, Department of Mathematics, North Carolina State University. April 12, 2017.

171. **Mathematisches Forschungsinstitut Oberwolfach.** Emerging Developments in Interfaces and Free Boundaries. Oberwolfach, Germany. January 22-28, 2017.

172. Colloquium speaker, Department of Mathematics, University of Marburg, Marburg, Germany. January 18, 2017.

2016

173. Numerical Analysis and PDE Seminar speaker, University of Delaware, December 1, 2016.

174. Minisymposium speaker: Control, Optimization, and Differential Games. North Carolina State University, Raleigh, NC. November 12-13, 2016.

175. Finite Element Circus, Worcester Polytechnic Institute, October 14-15, 2016.

176. Invited talk at workshop on Simulation and Optimization of Extreme Fluids. Heidelberg University, Germany. October 10-12, 2016.

177. **Distinguished speaker.** Algorithmic Optimization (ALOP) Colloquium, Department of Mathematics, University of Trier. Trier, Germany. October 5, 2016.

178. Minisymposium speaker. SIAM Conference on Mathematics for Planet Earth. Philadelphia, Pennsylvania, USA. September 30 - October 2, 2016.

179. Minisymposium speaker. The Fifth International Conference on Continuous Optimization (ICCOPT). Tokyo, Japan. August 8-11, 2016.

180. Minisymposium speaker. Recent Advances in Finite Element Methods for Nonlinear PDEs. SIAM Annual Meeting, Boston. July 11-14, 2016.

181. **Tutorial speaker**. Frontiers in PDE constrained optimization. IMA, Minneapolis. June 6-10, 2016.

182. Invited speaker at DelMar Numerics Day, Annual Workshop on Computational Mathematics, George Mason University, Fairfax, VA, May 14, 2015.

183. Seminar speaker. Computational Science Seminars. Department of Mathematics, University of Massachusetts Dartmouth, North Dartmouth, MA. May 3, 2016.

184. Finite element circus, University of Maryland, College Park, MD. April 15-16, 2016.

185. Applied Math Seminar speaker at Technische Universität München, Germany. April 13, 2016.

186. Minisymposium speaker. SIAM Conference on Uncertainty Quantification. April 5-8, 2016. EPFL, Lausanne, Switzerland.

187. Colloquium speaker at Weierstrass Institute, Berlin, Germany, March 2, 2016.

188. Colloquium, Department of Mathematics and Statistics, UNC Charlotte. February 12, 2016.

189. Numerical Analysis Seminar at the University of Maryland, College Park. February 9, 2016.

190. **Keynote speaker** at the SIAM student Chapter, Iowa State University January 27, 2015. `https://www.stuorg.iastate.edu/site/siam-isu/photo-gallery/182/album`

191. Colloquium speaker at Department of Mathematics, Iowa State University January 26, 2015.

192. Seminar speaker at Department of Mathematics, North Carolina State University January 22, 2015.

193. Minisymposium speaker. Advances in Finite and Boundary Elements. WONAPDE 2016, Chile, January 11-15, 2016.

194. Minisymposium speaker. Computational Electromagnetism. WONAPDE 2016, Chile, January 11-15, 2016.

2015

195. Colloquium speaker at Naval Research Labs (NRL). December 15, 2015.

196. Computational/Applied Math Seminar, Department of Mathematics, University of Tennessee, October 28, 2015.

197. Minisymposium speaker. Advances in Numerical Methods for PDEs with Applications. SIAM PDE, Scottsdale Arizona. December 7-10, 2015.

198. Applied and Computational Math Seminar. George Mason University, Fairfax, VA. September 11, 2015.

199. Colloquium speaker at Department of Mathematics, Humboldt Universität Zu Berlin, Germany, July 2015.

200. Minisymposium speaker. The International Symposium on Optimization (ISMP) 2015. Carnegie Mellon University and University of Pittsburgh. July 12-17, 2015.

201. **Summer School Teacher.** Ciudad Real Numerica 2015. Topic: Numerical Methods for Optimal Control Problems. Ciudad Real, Spain. June 29-July 2, 2015.

202. Invited lecture at EXTREEMS Undergraduate Research Program. George Mason University, Fairfax, Virginia. May 20, 2015.

203. Invited speaker at DelMar Numerics Day, Annual Workshop on Computational Mathematics, United State Naval Academy, Annapolis, May 9, 2015.

204. PDE Seminar speaker at George Mason University, Fairfax, Virginia. April 27, 2015.

205. Finite element circus, George Mason University, Fairfax, Virginia. March 27-28, 2015.

206. Minisymposium speaker. Reduced-order Models for PDE-constrained Optimization Problems. SIAM Conference on Computational Science and Engineering. March 14-18, 2015.

207. Applied Math Seminar speaker at Technische Universität München, Germany. March 12, 2015.

208. Invited speaker at Workshop on Numerical Methods for Optimal Control and Inverse Problems. Technische Universität München, Germany. March 9-11, 2015.

209. Scientific Computing Seminar at Division of Applied Mathematics, Brown University. February 6, 2015.

210. Differential Equation Seminar speaker at Department of Mathematics, University of Maryland, Baltimore County. February 2, 2015.

211. Applied Math Seminar speaker at Sandia National Laboratories - Livermore, CA. January 13, 2015.

2014

212. Minisymposium speaker. Title: Geometric Discretization Methods and Adaptivity. CMS Winter Meeting, Hamilton, Ontario. December 5-8, 2014.

213. Finite element circus, IMA University of Minnesota, October 24-25, 2014.

214. **Plenary speaker** at Modeling, Analysis and Computing in Nonlinear PDEs. Chateau Liblice, Prague, Czech Republic. September 21-26, 2014.

215. Minisymposium speaker. Title: Complex fluids. SIAM annual meeting, July 7-11, 2014.

216. Minisymposium speaker. Title: Model reduction: new trends and recent advances. International conference on spectral and higher order methods. June 23-27, 2014.

217. Colloquium speaker at Department of Mathematics, Humboldt Universität Zu Berlin, Germany, June 11, 2014.

218. Minisymposium speaker. Title: Nonsmooth PDE-constrained optimization. SIAM conference on optimization. May 19-22, 2014.

219. Invited speaker at DelMar Numerics Day, Annual Workshop on Computational Mathematics, University of Maryland, Baltimore County, May 10, 2014.

220. Minisymposium speaker. Title: Advanced Applications of Finite Element Methods. SIAM Seas, March 28-30, 2014.

221. Finite element rodeo, University of Texas, Austin, Texas, February 28 - March 1, 2014.

222. Colloquium, Department of Mathematics, James Madison University, January 27, 2014.

2013

223. AG-Seminar Optimierung, Department of Mathematics, TU Darmstadt, Germany, December 17, 2013.

224. Applied and Computational Mathematics Division Seminar Series at the National Institute of Standards and Technology (NIST), December 2, 2013.

225. Colloquium, Department of Mathematics, University of Tennessee, November 22, 2013.

226. Computational/Applied Math Seminar, Department of Mathematics, University of Tennessee, November 20, 2013.

227. Finite element circus, University of Delaware, Newark, Delaware, October 18-19, 2013.

228. Computational Math Seminar, University of Pittsburgh, September 24, 2013.

229. **Plenary speaker** at Domain Decomposition Methods for Optimization with PDE Constraints. Ascona, Switzerland, September 1-6, 2013.

230. A Stokes Free Boundary Problem with Surface Tension Effects. ENUMATH, Switzerland, August 26-30, 2013.

231. A Stokes Free Boundary Problem with Surface Tension Effects. ICCOPT, Portugal, July 27 - August 1, 2013.

232. A Stokes Free Boundary Problem with Surface Tension Effects. Numerical Approximation of PDEs, Italy March 20-21, 2013.

233. Two-step Greedy Algorithm for Reduced Order Quadratures. SIAM Conference on Computational Science and Engineering, Boston February 25-March 1, 2013.

234. Two-step Greedy Algorithm for Reduced Order Quadratures. WONAPDE 2013, Chile, January 14-18, 2013.

235. Optimal Control of a Free Boundary Problem with Surface Tension Effects. WONAPDE 2013, Chile, January 14-18, 2013.

2012

236. Optimal Control of a Free Boundary Problem with Second Order Sufficient Conditions. **Mathematisches Forschungsinstitut Oberwolfach**, Germany, November 25-December 1, 2012.
237. Optimal Control of a Free Boundary Problem with Surface Tension Effects. United State Naval Academy, Annapolis, November 7, 2012.
238. Optimal Control of a Free Boundary Problem with Surface Tension Effects. Louisiana State University, November 6, 2012.
239. Optimal Control of a Free Boundary Problem. Finite Element Circus, October 2012, University of Pittsburgh, Pittsburgh.
240. Finite Element Methods for Linear and Nonlinear PDEs. REU, George Mason University, July 18, 2012.
241. Optimization and Model Reduction of PDE-Constrained Problems. Humboldt Universität Zu Berlin, June 27, 2012.
242. Application-Specific, Fast, High Accuracy Reduced Order Quadratures with Application to Gravitational Waves. Delaware Maryland Numerics Day (DelMar), University of Delaware, April 28, 2012.
243. Application-Specific, Fast, High Accuracy Reduced Order Quadratures. SIAM Conference on Uncertainty Quantification, Raleigh, North Carolina, April 4, 2012.
244. Optimal Control of a Free Boundary Problem with Second Order Sufficient Optimality Conditions. SIAM, SEAS, University of Alabama, Huntsville, March 24-25, 2012.
245. Optimal Control of a Free Boundary Problem with Second Order Sufficient Optimality Conditions. Numerical Analysis and PDE Seminar, University of Delaware, March 15, 2012.
246. Application-Specific, Fast, High Accuracy Reduced Order Quadratures. Texas Finite Element Rodeo, February 2012, Rice University, Houston, Tx.
247. Reduced Order Modeling for Parametric Nonlinear PDE Constrained Optimization Problems. Scientific Computing Seminar, George Mason University, January 27, 2012.
248. Reduced Order Modeling for Parametric Nonlinear PDE Constrained Optimization Problems. Computational and Applied Mathematics Colloquium, Penn State University, January 20, 2012.
249. Optimal Control of a Free Boundary Problem with Second Order Sufficient Optimality Conditions. CCMA Luncheon Seminar, Penn State University, January 20, 2012.

2011

250. A Primal-Dual Active Set Strategy to Solve Optimal Control Problem With State and Gradient Constraints. Finite Element Circus, October 2011, University of Connecticut, Connecticut.
251. Optimal Control of a Free Boundary Problem with Second Order Sufficient Optimality Conditions. ICIAM, Vancouver, July 18-22, 2011.
252. Reduced Order Modeling for Parametric Nonlinear PDEs Using POD-DEIM. ICIAM. Vancouver, July 18-22, 2011.

253. Reduced Order Modeling for Parametric Nonlinear PDE Constrained Optimization Problems. Texas Finite Element Rodeo, February 2011, Texas A & M, College Station.

254. Reduced Order Modeling for Parametric Nonlinear PDE Constrained Optimization Problems. Schlumberger Oilfield Services, Sugar Land, Tx, Feb 24, 2011.

2010

255. Reduced Order Modeling for Parametric Nonlinear PDEs Using POD-DEIM. Scientific Computing Seminar, University of Houston, November 11, 2010.

256. Reduced Order Modeling for Parametric Nonlinear PDEs Using POD-DEIM. Scientific Computing and Numerical Analysis Seminar, Rice University, October 20, 2010.

257. Reduced Order Modeling for Parametric Nonlinear PDE Constrained Problems Using POD-DEIM. Workshop on Model Management and Reduced Order Model Approaches for Simulation Driven Optimization, Rice University, October 11-12, 2010.

258. Goal Oriented A Posteriori Error Estimates for the Linear-Quadratic Optimal Control Problems Using POD. Workshop: Optimal Control of PDEs, Cortona, July, 12-17, 2010.

259. Reduced Order Modeling Based Shape Optimization of Time Dependent PDE-Constrained Optimization Problems. Numerical Analysis Seminar, University of Maryland, March 9, 2010.

260. Model Reduction and Shape Optimization of Microfluidic Biochips. Texas Finite Element Rodeo, February 2010, SMU, Dallas.

261. Optimization and Model Reduction of Time Dependent PDE-Constrained Optimization Problems. Sandia National Laboratories, Albuquerque, New Mexico, January 11, 2010.

2009

262. Optimization and Model Reduction of Time Dependent PDE-Constrained Optimization Problems. MoRePaS, Model Reduction of Parametrized Systems, University of Münster, Germany, September 16-18, 2009.

263. Domain Decomposition and Model Reduction for Shape Optimization Problems. Texas Finite Element Rodeo, March 2009, ICES University of Texas, Austin.

264. Shape Optimization Governed by the Heat and the Stokes Equations Using Domain Decomposition and Model Reduction. **Mathematisches Forschungsinstitut Oberwolfach**, Germany, January 25-31, 2009.

2008

265. Electro-Magnetic Logging in 3D Anisotropic Media Using an Efficient FD Scheme, June 2008, University of Augsburg, Germany.

266. Primal-Dual Interior-Point Methods for Shape Optimization Problems. Texas Student SIAM Conference, 2008, Rice University.

2007

267. Adaptive Multilevel Path-following Primal-Dual Interior-Point Methods for Shape Optimization in Stationary Flow Problems. SIAM Conference on Control and its Applications, June 2007, San Francisco.

268. Path-following Primal-Dual Interior-Point Methods for Shape Optimization in Stationary Flow Problems. Texas Finite Element Rodeo March 2007, University of Houston.

Teaching Experience

George Mason University

Fall 2025	Math 685 – Numerical Analysis
Fall 2024	Math 678 – Partial Differential Equations Math 697 – Yaw Owusu Agyemang (6 credits) Math 697 – Felipe Silva (3 credits) Math 697 – Umarkhon Rakhimov (6 credits)
Summer 2024	Math 999 – Kiefer Green (1 credit)
Spring 2024	Math 999 – Kiefer Green (1 credit)
Fall 2023	Math 685 – Numerical Analysis Math 697 – Optimization w/PDE Constraints (3 credits) Math 999 – Kiefer Green (3 credits)
Spring 2023	Phys 796 – Facundo N. Airaudo (3 credits) Math 999 – David Sayre (3 credits) Math 999 – Mohammed Alshehri (9 credits) Math 999 – Kiefer Green (3 credits)
Fall 2022	Math 463 / Math 663 – Math for Machine Learning I Math 462 / Math 662 – Math for Machine Learning II Math 697 – Mohammed Alshehri (9 credits) Math 998 – Kiefer Green (6 credits) Math 998 – David Sayre (3 credits) Phys 796 – Facundo N. Airaudo (2 credits)
Spring 2022	Math 697 – Mohammed Alshehri (6 credits) Math 998 – Kiefer Green (3 credits) Math 998 – David Sayre (3 credits) Phys 796 – Facundo N. Airaudo (6 credits)
Fall 2021	Math 463 / Math 663 (**New course created**) Math 462 / Math 662 (**New course created**) Math 697 – David Sayre (4 credits) Math 998 – Kiefer Green (2 credits)
Spring 2021	Math 689 – Optimization, Nonlinear PDEs & Deep Learning (**New special topics class**) Math 999 – Mahendra Panagoda (1 credit) Math 998 – Deepanshu Verma (6 credits) Math 697 – David Sayre (3 credits)
Fall 2020	Research Fellow at ICERM, Brown University
Spring 2020	Math 999 – Ratna Khatri (9 credits) Math 998 – Deepanshu Verma (8 credits)
Fall 2019	PDE-Control Seminar – Linear Algebra and Data Analysis Math 678 – Partial Differential Equations Math 113 – Analytic Geometry and Calculus I Math 697 – Ratna Khatri (3 credits) Math 697 – Igor Semyonov (3 credits) Math 697 – Mahendra Panagoda (1 credit) Math 998 – Ratna Khatri (6 credits) Math 998 – Deepanshu Verma (5 credits) Dissertation credit at Univ. of Delaware – Hugo Díaz-Norambuena (6 credits)

Spring 2019	Math 689 – Deep Learning and Optimization Under Uncertainty (**New special topics class**) Math 697 – Deepanshu Verma (2 credits) PDE-Control Seminar – Numerical Methods for PDEs
Fall 2018	Math 689 – Deep Learning and PDE-Constrained Optimization (**New special topics class**) Math 697 – Deepanshu Verma (2 credits) PDE-Control Seminar – Nonlinear Programming
Spring 2018	Math 685 – Numerical Analysis PDE-Control Seminar – Optimization with PDE Constraints I
Fall 2017	Math 678 – Partial Differential Equations PDE-Control Seminar – Uncertainty Quantification
Spring 2017	Math 689 – Calculus of Variations (**Special topics class**) PDE-Control Seminar – Fractional PDEs
Fall 2016	Math 689 – Adaptive Finite Element Methods (**New special topics class**) Math 697 – Ratna Khatri (3 credits) Math 697 – Sayomi Stallings (3 credits) PDE-Control Seminar – Γ-convergence
Spring 2016	Pre-tenure sabbatical
Fall 2015	Math 678 – Partial Differential Equations Math 113 – Analytic Geometry and Calculus I PDE-Control Seminar – Optimization with PDE Constraints II
Spring 2015	Math 689 – Calculus of Variations (**New special topics class**) Math 697 – Mahendra Panagoda (1 credit) PDE-Control Seminar – Optimization with PDE Constraints I
Fall 2014	Math 113 – Analytic Geometry and Calculus I Math 697 – Mahendra Panagoda (1 credit) PDE-Control Seminar – Optimization in Finite Dimensions
Spring 2014	Math 689 – Finite Element Methods for PDEs (**New special topics class**) Math 697 – Mahendra Panagoda (1 credit) PDE-Control Seminar – Finite Element Methods
Fall 2013	Math 413 – Modern Applied Math I Math 405 – Alexander Goldstone (3 credits) Math 697 – Diego Torrejon (3 credits) PDE-Control Seminar – Optimization with PDEs
Spring 2013	Math 685 – Numerical Methods
Fall 2012	Math 315 – Advanced Calculus

University of Maryland, College Park

Spring 2012	Math 401 – Applications of Linear Algebra
Fall 2011	Math 241H – Calculus III (Honors)
Spring 2011	Math 310 – Introduction to Analysis

Professional Service

Leadership (Selected)

- SIAM DC-MD-VA Section *President* (since 2023), *Vice-President* (2022-23). Revived this dormant section and have chaired the last 4 annual section meetings. Also, recently help change the section name.
- Founder/Director of Center for Mathematics and Artificial Intelligence (CMAI), in collaboration with then SIAM President (Prof. Sue Brenner), see `https://cmai.gmu.edu/people/#advisors-affiliates`
- Founder/Director of Digital Twin Lab together with TU Munich, SIEMENS, and Sandia Labs `https://cmai.gmu.edu/digital-twin-lab/`

- Tasked by NSF, my report (`https://arxiv.org/pdf/2402.10326`) helped create two new funding NSF funding programs on Digital Twins.

Editorial Activities

2025 –	Chief Guest Editor, *Journal of Numerical Mathematics*, De Gruyter.
2023 –	Associate Editor, *Journal of Optimization Theory and Applications*, Springer.
2023	Chief Guest Editor, *Finite Elements in Analysis and Design*, Elsevier.
2022 –	Associate Editor, *SIAM Journal of Scientific Computing*.
2021 –	Associate Editor, *SIAM Review 'Book' Section*.
2021 – 2024	**Editor-in-Chief**, *Advances in Discrete and Continuous Models*, Springer.
2019 –	Associate Editor, *Mathematical Control and Related Fields*, AIMS.

Conferences, Minisymposia, and Seminars Organized

Major Conferences Organized

1. **Co-organizer and Co-Chair.** "The Mathematics of Scientific Machine Learning and Digital Twins" International School of Mathematics G. Stampacchia, Erice (Sicily), Italy. November 19–25, 2025. Co-organized with Enrique Zuazua (FAU Erlangen, Germany). `https://cmai.gmu.edu/scimldt/`
2. **Co-organizer and Chair.** "Finite Element Circus" George Mason University, Arlington, VA. October 17–18, 2025. Co-organized with Keegan Kirk, Rohit Khandelwal, and Sarswati Shah (GMU). `https://cmai.gmu.edu/finite-element-circus/`
3. **Co-organizer.** "Sayas Numerics Day" (annual computational mathematics conference). University of Delaware, May 3, 2025. `https://numericsday.math.umd.edu`
4. **Organizer and Chair.** *Annual East Coast Optimization Meeting (ECOM)* – Fifth Workshop (in person). George Mason University, Arlington, VA, April 17–18, 2025. Co-organized with Drew Kouri and Denis Ridzal (Sandia National Labs). `http://math.gmu.edu/~hantil/ECOM/2025/`
5. **Co-organizer and Chair.** SIAM Washington–Baltimore Section Meeting, December 6, 2024. Co-organized with Ratna Khatri (Naval Research Lab). `https://math.gmu.edu/~hantil/SIAM/Fall2024/`
6. **Co-organizer.** 8th International Conference on Computational and Mathematical Biomedical Engineering (CMBE24). June 24–26, 2024. Attendance: 170. `https://www.compbiomed.net/2024/index.htm`
7. **Co-organizer and Chair.** "Sayas Numerics Day" George Mason University, Arlington, VA, May 11, 2024. `https://numericsday.math.umd.edu`
8. **Co-organizer and Chair.** "Mathematical Opportunities in Digital Twins" George Mason University, Arlington, VA, December 11–13, 2023. Co-organized with Benjamin Seibold (Temple) and Kathrin Smetana (Stevens). `https://mathdt.science.gmu.edu`
9. **Organizer and Chair.** *Annual East Coast Optimization Meeting (ECOM)* – Fourth Workshop (virtual). George Mason University, Fairfax, VA, April 13–14, 2023. Co-organized with Drew Kouri and Denis Ridzal (Sandia National Labs). `http://math.gmu.edu/~hantil/ECOM/2023/`
10. **Co-organizer.** SIAM Washington–Baltimore Section Meeting, November 4, 2022. Co-organized with Ratna Khatri (NRL) and Andrey Ruskin (Metron Inc.). `https://math.gmu.edu/~hantil/SIAM/Fall2022/`
11. **Co-organizer.** International Workshop on *Nonlocality in Analysis, Numerics and Applications*. Lorentz Center, Leiden, Netherlands, October 3–7, 2022. Co-organizers: Carolin Kreisbeck (Utrecht), Patrick Dondl (Freiburg), Qiang Du (Columbia).
`https://www.lorentzcenter.nl/nonlocality-in-analysis-numerics-and-applications.html`

12. **Co-organizer and Scientific Committee Member.** "Sayas Numerics Day" University of Maryland, Baltimore County, September 17, 2022. https://numericsday.math.umd.edu
13. **Organizer.** Summer School: *Nonlocal School on Fractional Equations (NSFE 2022).* Iowa State University, Ames, IA, June 9–11, 2022. Co-organizers: Paul Sacks, Pablo Stinga (Iowa State). https://pabloraulstinga.github.io/NSFE2022.html
14. **Co-organizer.** MathWorks–CMAI Joint Workshop with FAU Erlangen, Germany. April 28–29, 2022. Over 400 participants.
15. **Organizer and Chair.** *Annual East Coast Optimization Meeting (ECOM)* – Third Workshop (virtual). George Mason University, March 31 – April 1, 2022. Co-organized with Drew Kouri and Denis Ridzal. http://math.gmu.edu/~hantil/ECOM/2022/
16. **Organizer and Chair.** CMAI–MathWorks Workshop: "Deep Learning with MATLAB (Hands-On)". November 10, 2021. 100 participants.
17. **Co-organizer.** International Workshop (virtual): *Nonlocality in Analysis, Numerics and Applications.* October 25–29, 2021. Co-organizers: Carolin Kreisbeck (Utrecht), Patrick Dondl (Freiburg), Qiang Du (Columbia).
18. **Organizer and Chair.** CMAI Meets Industry Symposium. June 25, 2021. https://math.gmu.edu/~hantil/CMAI/Industry/2021/
19. **Organizer and Chair.** CMAI Summer School: *Risk-Averse PDE-Constrained Optimization.* June 18, 2021. https://math.gmu.edu/~hantil/CMAI/SummerSchool/2021/Surowiec/
20. **Organizer and Chair.** *Annual East Coast Optimization Meeting (ECOM)* – Second Workshop (virtual). George Mason University, April 1–2, 2021. Co-organized with Drew Kouri and Denis Ridzal. http://math.gmu.edu/~hantil/ECOM/2021/
21. **Co-organizer and Scientific Committee Member.** "Sayas Numerics Day", UMBC, May 9, 2020. (Cancelled due to COVID).
22. **Organizer and Chair.** CMAI–MathWorks Workshop: "Deep Learning with MATLAB (Hands-On)". November 20, 2020. 246 participants.
23. **Organizer and Chair.** *Annual East Coast Optimization Meeting (ECOM)* – Second Workshop. George Mason University, April 2–3, 2020. (Cancelled due to COVID).
24. **Organizer and Chair.** *Annual East Coast Optimization Meeting (ECOM)* – First Workshop. George Mason University, April 4–5, 2019. 75 participants, 2 tutorials (6 hours), 4 invited talks, 19 contributed talks. http://math.gmu.edu/~hantil/ECOM/2019/
25. **Organizer and Chair.** Winter School: *New Directions in PDE-Constrained Optimization.* IIT Bombay, India, March 12–16, 2018. Co-organized with A. Kumar (Shiv Nadar), N. Nataraj (IIT Bombay), T.M. Surowiec (Marburg). https://www.atmschools.org/2018/atmw/ndpco/speakers-and-syllabus
26. **Member, Organizing Committee.** Mason Modeling Days, George Mason University, June 28 – July 1, 2017. Supervised 9 students (image denoising with fractional models). https://sites.google.com/site/masonmodelingdays/home
27. **Organizer and Co-chair.** *Nonlocal School on Fractional Equations (NSFE 2017).* Iowa State University, August 17–19, 2017. Tutorials by L. Caffarelli (UT Austin) and R.H. Nochetto (UMD). 65 attendees. https://stinga.public.iastate.edu/NSFE2017.html
28. **Organizer and Chair.** Conference: *Frontiers in PDE-Constrained Optimization.* IMA, Minneapolis, June 6–10, 2016. Co-organized with D. Kouri, D. Ridzal, M. Lacasse (ExxonMobil). https://www.ima.umn.edu/2015-2016/SW6.6-10.16/?event_id=SW6.6-10.16
29. **Organizer and Chair.** Delaware–Maryland Numerics Day (DelMar). George Mason University, Spring 2016. 45 attendees.

30. **Organizer and Chair.** *Finite Element Circus*, George Mason University, Spring 2015. 80 attendees. `https://sites.google.com/site/finiteelementcircus/`

31. **Organizer and Chair.** Workshop: *Advances in Numerical Analysis and Scientific Computing.* 60th Anniversary of Ronald H.W. Hoppe. University of Houston, April 15–16, 2011. Co-organized with Y. Kuznetsov, J. Morgan, T.W. Pan. `http://www.math.uh.edu/~pan/Hoppe/`

Minisymposia at Major Conferences

32. **Organizer.** Minisymposium: "Advanced Methods for Multi-Disciplinary Optimization and System Identification in Engineering Applications". 11th GACM Colloquium on Computational Mechanics, Braunschweig, Germany, September 21–24, 2025. Co-organizers: Ihar Antonau, Suneth Warnakulasuriya, Talhah Ansari, Roland Wüchner (TU Munich), Rainald Löhner (GMU), Facundo Airaudo (GMU).

33. **Organizer.** Minisymposium: "Advanced Methods for System Identification and Optimal Sensor Placement in Complex Engineering Applications". ECCOMAS Young Investigators Conference (YIC2025), Pescara, Italy, September 17–19, 2025. Co-organizers: Suneth Warnakulasuriya, Ihar Antonau, Talhah Ansari, Roland Wüchner (TU Munich), Rainald Löhner (GMU), Facundo Airaudo (GMU).

34. **Organizer.** Minisymposium: "Digital Twins: Methods & Applications". SIAM Annual Meeting (AN25), Montreal, Canada, July 8–12, 2025. Co-organizer: Amit Chakraborty (Siemens). 10 speakers.

35. **Organizer.** Minisymposium: "Nonsmooth PDE-Constrained Optimization: Algorithms and Applications". ICCOPT 2025, University of Southern California, Los Angeles, CA, July 21–24, 2025. Co-organizers: Robert Baraldi (Sandia), Denis Ridzal (Sandia). 9 speakers.

36. **Organizer.** Minisymposium: "PDE-Constrained Optimization: Algorithms and Applications". SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, TX, March 3–7, 2025. Co-organizers: Robert Baraldi (Sandia), Drew P. Kouri (Sandia), Denis Ridzal (Sandia).

37. **Organizer.** Minisymposium: "Nonsmooth PDE-Constrained Optimization". 25th International Symposium on Mathematical Programming (ISMP), Montreal, Canada, July 21–26, 2024. Co-organizers: Rohit Khandelwal (GMU), Robert Baraldi (Sandia), Drew P. Kouri (Sandia).

38. **Organizer.** Minisymposium: "Scalable Optimal Control Algorithms in High Performance Computing". Platform for Advanced Scientific Computing (PASC), Zurich, Switzerland, June 3–5, 2024. Co-organizer: Robert Baraldi (Sandia).

39. **Organizer.** Minisymposium: "Role of Numerics and Optimization in Materials Science". SIAM Conference on Mathematical Aspects of Materials Science (MS24), Pittsburgh, PA, May 19–23, 2024. Co-organizer: Lucas Bouck (Carnegie Mellon).

40. **Organizer.** Minisymposium: "Mathematical Opportunities in Digital Twins". AMS Spring Eastern Sectional Meeting, Washington, DC, April 6–7, 2024. Co-organizers: Sean Carney (GMU), Rohit Khandelwal (GMU).

41. **Organizer.** Minisymposium: "Recent Advances in Large-Scale Optimal Engineering Design". 17th U.S. National Congress on Computational Mechanics (USNCCM17), Albuquerque, NM, July 24–27, 2023. Co-organizers: Brendan Keith (Brown), Boyan Lazarov (LLNL), Drew P. Kouri (Sandia), Denis Ridzal (Sandia). 10 speakers.

42. **Organizer.** Minisymposium: "Applications in Dynamic Optimization and Games". SIAM Conference on Optimization (OP23), Seattle, WA, May 31 – June 3, 2023. Co-organizers: Drew P. Kouri (Sandia), Denis Ridzal (Sandia). 12 speakers.

43. **Organizer.** Minisymposium: "PDE-Constrained Optimization and Applications". SIAM Southeastern Atlantic Section Annual Meeting, Virginia Tech, Blacksburg, VA, March 25–26, 2023. Co-organizers: Madhu Gupta (VT), Randy Price (VT). 8 speakers.

44. **Organizer.** Minisymposium: "Algorithmic Advances in Applications of PDE-Constrained Optimization". 7th International Conference on Continuous Optimization (ICCOPT), Lehigh University, Bethlehem, PA, July 25, 2022. Co-organizers: Drew P. Kouri (Sandia), Denis Ridzal (Sandia). 6 speakers.
45. **Organizer.** Minisymposium: "Structure-Exploiting Algorithms for Large-Scale Continuous Optimization". SIAM Conference on Optimization (OP21), Spokane, WA, July 19–23, 2021. Co-organizers: Drew P. Kouri (Sandia), Denis Ridzal (Sandia). 8 speakers.
46. **Organizer.** Minisymposium: "Nonlocal Analysis and Numerics". SIAM Annual Meeting (AN21), Spokane, WA, July 19–23, 2021. Co-organizer: Patrick Dondl (Freiburg). 8 speakers.
47. **Organizer.** Minisymposium: "Optimal Control and Deep Learning". SIAM Conference on Computational Science and Engineering (CSE21), Spokane, WA, March 1–5, 2021. Co-organizers: T.S. Brown (GMU), R. Khatri (GMU), D. Verma (GMU). 10 speakers.
48. **Organizer.** Minisymposium: "Nonlocal PDEs and Calculus of Variations". IFIP TC7 Conference on System Modelling and Optimization, Quito, Ecuador, August 31 – September 4, 2020. Co-organizers: C.N. Rautenberg (Chile), M. Warma (GMU). (Postponed due to COVID).
49. **Organizer.** Minisymposium: "Optimal Control and Learning". SIAM Conference on Mathematics of Data Science (MDS20), Cincinnati, OH (virtual), May 5–7, 2020. Co-organizers: T.S. Brown (GMU), R. Khatri (GMU). 8 speakers.
50. **Organizer.** Minisymposium: "Optimization with PDE Constraints: Analysis and Numerics". SIAM Conference on Analysis of Partial Differential Equations (PD19), La Quinta, CA, December 11–14, 2019. Co-organizer: Dmitriy Leykekhman (UConn). 5 speakers.
51. **Organizer.** Minisymposium: "Fractional/Nonlocal PDEs: Applications, Control, and Beyond". 6th International Conference on Continuous Optimization (ICCOPT), Berlin, Germany, August 5–8, 2019. Co-organizers: Carlos Rautenberg (Humboldt), Mahamadi Warma (UPR). 6 speakers.
52. **Organizer.** Minisymposium: "PDE-Constrained Optimization under Uncertainty". 6th International Conference on Continuous Optimization (ICCOPT), Berlin, Germany, August 5–8, 2019. Co-organizers: Drew P. Kouri (Sandia), Thomas Surowiec (Marburg), Stepan Ulbrich (Darmstadt), Michael Ulbrich (TU Munich). 9 speakers.
53. **Organizer.** Minisymposium: "Methods for Large-Scale Risk-Averse Optimization". SIAM Conference on Computational Science and Engineering (CSE19), Spokane, WA, February 25 – March 1, 2019. Co-organizer: Drew P. Kouri (Sandia). 8 speakers.
54. **Organizer.** Minisymposium: "Risk-Averse PDE-Constrained Optimization: Methods and Applications". 23rd International Symposium on Mathematical Programming (ISMP), Bordeaux, France, July 1–6, 2018. Co-organizer: Drew P. Kouri (Sandia). 8 speakers.
55. **Organizer.** Minisymposium: "Advances in Reconstruction Algorithms for Computed Tomography". SIAM Conference on Imaging Science (IS18), Bologna, Italy, June 5–8, 2018. Co-organizer: Gunay Dogan (NIST). 4 sessions (16 speakers).
56. **Organizer.** Minisymposium: "Exploiting Structure in Optimization under Uncertainty". SIAM Conference on Uncertainty Quantification (UQ18), Garden Grove, CA, April 16–19, 2018. Co-organizers: Drew P. Kouri (Sandia), Denis Ridzal (Sandia), Thomas Surowiec (Marburg). 2 sessions (8 speakers).
57. **Organizer.** Minisymposium: "Mathematical Advances in Hydrology: Non-Stationarity and Data Assimilation". SIAM Conference on Mathematics of Planet Earth (MPE16), Philadelphia, PA, September 30 – October 2, 2016. Co-organizers: Maria Emelianenko (GMU), Paul Houser (GMU), Viviana Maggioni (GMU), Tim Sauer (GMU).
58. **Organizer.** Minisymposium: "Numerical Methods for Nonlocal Problems". 5th Chilean Workshop on Numerical Analysis of PDEs (WONAPDE2016), Concepción, Chile, January 11–15, 2016. Co-organizers: Enrique Otárola (Santa Maria), Alejandro J. Salgado (Tennessee). `http://www.ci2ma.udec.cl/wonapde2016/`

59. **Organizer.** Minisymposium: "Advances in Numerical Methods for PDEs with Applications". SIAM Conference on Analysis of PDEs (PD15), Scottsdale, AZ, December 7–10, 2015. Co-organizer: Lise-Marie Imbert–Gerard (NYU). `http://www.siam.org/meetings/pd15/`

60. **Organizer.** Minisymposium: "Shape Optimization and Optimal Control for PDE-Constrained Problems". Domain Decomposition Methods for Optimization with PDE Constraints, Ascona, Switzerland, September 1–6, 2013. Co-organizers: M. Heinkenschloss (Rice), R.H.W. Hoppe (Houston). `http://www.unige.ch/math/ascona2013/`

61. **Organizer.** Minisymposium: "Model Reduction for Nonlinear Problems and PDE-Constrained Optimization". 4th Chilean Workshop on Numerical Analysis of PDEs (WONAPDE2013), Concepción, Chile, January 14–18, 2013. Co-organizers: R.H. Nochetto (UMD), Y. Maday (Paris). `http://www.ci2ma.udec.cl/wonapde2013/`

Colloquia and Seminars at GMU

62. Chair, CMAI Colloquium Series (since May 2020). Launched as a virtual series, regularly 60–70 participants in Summer 2020; now over 1100 registered participants from 6 continents.

63. Organizer and Chair. Seminar: "Satellite Image Analysis via Deep Learning". George Mason University, Spring 2019. Over 40 participants.

64. Organizer and Chair. PDE Control Seminar, GMU (every semester since Fall 2013).

65. Co-organizer. Applied and Computational Mathematics Seminar, GMU (since Spring 2014, with D. Anderson and I. Griva).

Reviewer for Journals (10-15 papers per year on average)

Journal de Mathématiques Pures et Appliquées – Mathematics of Computation – Archive for Rational Mechanics and Analysis – SIAM Journal of Optimization – SIAM Journal of Math Analysis – SIAM Journal of Control and Optimization – IMA Journal of Numerical Analysis – Numerische Mathematik – SIAM Journal of Scientific Computing – Journal of Optimization Theory and Applications – Journal of Scientific Computing – Journal of Mathematical Analysis and Applications – Advances in Computational Mathematics – Journal of Computational and Applied Mathematics – Computers & Fluids – Journal of Optics – Computational Optimization and Applications – IEEE Control Systems Society Conference Management System – IMA Journal of Mathematical Control and Information – Mathematical Reviews/MathSciNet Reviewer – zbMATH – Calcolo (CALC) – Optimization Methods and Software – Inverse Problems.

Book Reviews

Chapman & Hall/CRC - 2019
Springer 2022

National and International Scientific, Government, and Professional Committees

Member SIAM Committee on Section Activities, 2025-2027.

Evaluator of Promotion to Full Professor at NC State (2025)

Evaluator of Promotion to Full Professor at Emory University (2025)

Evaluator of W2 (Tenured Professor) at Technical University of Darmstadt, Germany (2024)

Evaluator of Promotion to Full Professor at University of Pittsburgh (2024)

Evaluator of Promotion to Full Professor at Michigan Technological University (2022)

Evaluator of W1 (Tenure-Track Professor) in Data Science in Erlangen Nuermberg, Germany (2022)

Evaluator of W3 (Full Professor) in Data Science in Augsburg, Germany (2021)

Evaluator of Promotion to Associate Professor (with tenure) at North Carolina State University (2021)

Evaluator of Promotion to Associate Professor (with tenure) at Michigan State University (2021)

Member, Gene Golub SIAM Summer School Committee, 2021–2027. (Chair since January 2025)

International external reviewer. Invited by Central Commission for Academic Evaluation at Universidad Técnica Federico Santa Maria, Chile. 2017.

International Panel participation

Evaluator of Banff International Research Station (BIRS) Workshop Proposal (mail in review) (2024)

Czech Science Foundation (mail in review) (2023)

Dutch Research Council (NWO) (mail in review) (2023)

Austrian Science Fund (FWF) (mail in review) (2020)

Chilean National Foundation (2017)

Indo-U.S. Science & Technology Forum (IUSSTF) (2018)

National Panel participation

Sandia National Lab, Grand Challenge proposal (mail in review) (2025)

AirForce Office of Scientific Research (AFOSR) (mail in review) (2024)

Army Research Office (mail in review) (2024)

Department of Energy (mail in review) (2024)

AirForce Office of Scientific Research (AFOSR) (mail in review) (2023)

National Science Foundation (panel) 2022

Department of Energy Early Career (panel) 2022

Department of Energy (panel) 2021

AirForce Office of Scientific Research (AFOSR) YIP Program (mail in review) (2020)

Department of Energy ASCR Leadership Computing Challenge (ALCC) (mail in review) (2020)

National Science Foundation (panel) (2020)

Department of Energy Early Career (panel) (2019)

Department of Energy Early Career (mail in review) (2019)

Department of Energy Early Career (mail in review) (2018)

National Science Foundation (panel) (2016)

Department of Energy Early Career (mail in review) (2016)

Membership in Professional Societies

Society for Industrial and Applied Mathematics (SIAM).

Mathematical Optimization Society (MOS).

(Multi-)University Level Committee

March 2019 - Current: Coordinator of Academic Cooperation between George Mason University and Indian Institute of Technology (IIT) Bombay, India. We have established a MOU to help recruit graduate students and to encourage exchange of students and faculty. Already one student is here from IIT Bombay.

University Level Committee

- COS search committee for an Associate Dean for Strategic Initiatives, Innovation, and College Affairs

- Mentor for the Office of Research, Innovation, and Economic Impact NSF CAREER Cohort (204-25)
- President's AI Task Force (2024-26)
- Department of Mathematical Sciences Chair search committee 2021.
- Department of Mathematical Sciences Chair search committee 2017.
- Nomination and Membership Committee. (two years) 2014-15.
- Academic Program Review Committee. (three years) 2013-16.

Department Level Committee

Chair Hiring Committee 2021

Hiring Committee (Chair) 2018-19 (hired two faculty members)

Committee for Reappointment of Department Chair - D. Walnut.

Graduate Committee (April 2018 - 2020)

Qualifying Exam Committee

Numerical analysis qualifying exam committee. George Mason University. Fall 2013 (chair), Spring 2014 (chair), Fall 2014, Spring 2015, Fall 2015, Fall 2018 (Chair), Spring 2019, Fall 2019, Spring 2020, Fall 2020, Spring 2021, Fall 2021, Spring 2022, Fall 2022, Fall 2023, and Fall 2024.