CURRICULUM VITAE

Nguyen Tien Khai

Department of Mathematics, NC State University
Webpage: *http://www4.ncsu.edu/ tnguye13/*
Email: *khai@math.ncsu.edu*

Education Background

- Ph.D. Mathematics, 2008-2011, University of Padova, Padova, Italy
  Thesis title: "The Regularity of The Minimum Time Function via Nonsmooth Analysis and Geometric Measure Theory"
  Advisor: Giovanni Colombo
- B.S., Honor Program in Mathematics, 2002 – 2006, University of Natural Sciences, HCM, Vietnam
  Thesis title: "Critical Points Of Non-C^2 Functional"
  Advisor: Duong Minh Duc

Professional Experience

- Associate Professor, August 2022 – present, NC State University, Mathematics Department, NC, USA
- Assistant Professor, August 2016 – 2022, NC State University, Mathematics Department, NC, USA
- S. Chowla Assistant Professor, August 2013 – June 2016, Penn State University, Mathematics Department, PA, USA
- ERC Postdoc, April 2011 – July 2013, International School for Advanced Studies, Trieste, Italy
- Lecturer, September 2006 – December 2007, University of Natural Sciences, Ho Chi Minh, Vietnam

Membership in Professional Organizations

- Center for Research in Scientific Computation, North Carolina State University, USA (2016-present)
- National Group for Mathematical Analysis Probability and Applications, Italy (2015-present)
- SIAM: Society of Industrial and Applied Mathematics (2017-2018)
- Padova team in the European Marie Curie research network SADCO (2011-2014)
- Member of Gruppo di Ricerca europeo Italo Francese sul Controllo delle Equazioni a Derivate Parziali (GDRE-CONEDP) (2009-2013)

Honors, Awards, and Fellowships

- 2023 – present NCSU Faculty Scholar
- 2023 – present Italian National Scientific Habilitations for Full Professorship
- 2017 – 2023 Italian National Scientific Habilitations for Second Class Professorship
- 2016 – present Associate Editor of Journal of Dynamical and Control Systems
- 2023 – 2025 **NSF - Supplemental Funding ($26,989)**
- 2022 – 2025 **NSF - Grant No. DMS - 2154201 ($137,192)** - Project: *"Generic Singularities and Fine Regularity Structure for Nonlinear Partial Differential Equations"*
- 2022 **NSF Conference - Grant No. DMS - 2220907 ($41,360)** - Project: *"40th Southeastern-Atlantic Regional Conference on Differential Equations*
- 2022 Visiting professorship in Italy, funded by **GNAMPA - INdAM (Euro 2,333)**
- 2022 Recipient of "Thank a Teacher" Letter, NCSU
- 2021 **John Franke Faculty Award for Teaching**
- 2019 Recipient of "Thank a Teacher" Letter, Spring and Fall

- 2018 **NCSU Faculty Research and Professional Development grant ($6,000)**
- 2018 Recipient of "Thank a Teacher" Letter, Spring and Fall
- 2017 – 2024 **SIMONS Collaboration Grant for Mathematicians - 521811 ($42,000)** - Project: *"Nonlinear PDEs, Differential Games and Applications"*
- 2017 Recipient of "Thank a Teacher" Letter, Spring and Fall
- 2017 – 2018 **GNAMPA 2017 - Travel grant (Euro 1,600)** - Project: *"Stochastic optimal control methods for the analysis of debt management problems"*
- 2013 – 2016 S. Chowla Research Assistant Professorship, PSU, USA
- 2012 **GNAMPA 2012 - Travel grant (Euro 2,500)** - Project: *"Controllability, stability and regularity for solutions of nonlinear hyperbolic equations"*
- 2011 – 2013 **ERC postdoc fellowship**, S.I.S.S.A, Italy
- 2011 – 2013 **Progetto d'Ateneo** - **Funded by** University of Padova, Italy (Euro 29,000) - Role in the project: Participant - *"Some analytic and differential geometric aspects in Nonlinear Control Theory, with applications to Mechanics"*
- 2011 – 2013 **Italian Prin 2009 - Funded by Italian government (Euro 109,276)** - Role in the project: Participant - *"Viscosity, metric and control theoretic methods in nonlinear diffusive models"*
- 2008 – 2010 **Cariparo fellowship**, University of Padova, Italy
- 2008 – 2010 **Italian Prin 2007 - Funded by Italian government (Euro 90,280)** - Role in the project: Participant - *"Viscosity, control theoretic and nonsmooth analysis methods for nonlinear elliptic, parabolic and Hamilton-Jacobi PDEs"*
- 2007 Odon Vallet Scholarship, Vietnam
- 2002 – 2006 Outstanding Student Scholarships, University of Science, Vietnam National University, Ho Chi Minh, Vietnam

Research Interests

- Nonlinear Partial Differential Equations
- Nonsmooth Analysis and Geometric Measure Theory
- Optimal Control, Differential Games, and Mean Field Games
- Models of traffic flows
- Models of mathematical finance

Scientific Publications

54. Bressan, A.; Mazzola, M; **Nguyen, K.T.**: Generic uniqueness and conjugate points for optimal control problems, submitted
53. Murdza, A; **Nguyen, K.T.**, A sharp quantitative estimate of critical sets, submitted
52. Murdza, A.; **Nguyen, K.T.**; Phillips, E.: Hausdroff measure of zeros of polynomials, submitted
51. Bressan, A.; **Nguyen, K.T.**: Generic solutions to controlled balance laws, submitted
50. Cannarsa, P; Mazzola, M; **Nguyen, K.T.**: On the structure of the value function of optimal exit time problems, *Calc. Var. Partial Differential Equations*, accepted
49. Bociu, L;, Ftaka, E.; **Nguyen, K.T.**; Schino, J.: Piecewise regular solutions to scalar balance laws with singular source terms, *Journal of Differential Equations*, **409** (2024), 181–222
48. Marigonda, F.; **Nguyen, K.T.**: Stochastic equilibrium solution for a debt management problem with currency devaluation, *Mathematical Control and Related Fields* **14** (2024), no. 2, 513–532.
47. Bressan, A.; Mazzola, M; **Nguyen, K.T.**: Diffusion approximations of Markovian solutions to discontinuous ODEs, *Journal of Dynamics and Differential Equations* **36** (2024), no.2, 1367–1404
46. Bressan, A.; Mazzola, M; **Nguyen, K.T.**: Generic properties of conjugate points in optimal control problems, *Mathematical Control and Related Fields* (2024), Doi: 10.3934/mcrf.2024042.

45. Barron E. N.; **Nguyen, K.T.**: Generalized Differential Games, *Dynamic Games and Applications* **13** (2023), no. 3, 705–720
44. Murdza, A.; **Nguyen, K.T.**: A quantitative version of the transversality theorem, *Communications in Mathematical Sciences* **21** (2023), no. 5, 1302–1320
43. Murdza, A.; **Nguyen, K.T.**: A lower bound on the quantitative version of the transversality theorem, *Journal of Mathematical Analysis and Applications* **528** (2023), no. 1, Paper No. 127539.
42. Ancona, F.; Bianchini, S.; Bressan, A.; Colombo, R.; **Nguyen, K.T.**: Examples and conjectures on the regularity of solutions to balance laws, *Quarterly of Applied Mathematics* **81**(2023), no. 3, 433–454
41. Bressan, A.; **Nguyen, K.T.**: Generic properties of first order mean field games, *Dynamic Games and Applications* **13** (2023), no.3, 750–782
40. Bressan, A.; Mazzola, M.; **Nguyen, K.T.**: Markovian solutions to discontinuous ODEs, *Journal of Dynamics and Differential Equations* **35** (2023), no.1, 135-162
39. Bianchini, S.; Dutta, P.; **Nguyen, K.T.**: Metric entropy for Hamilton-Jacobi equation with uniformly directional convex Hamiltonian, *SIAM Journal on Mathematical Analysis* **54** (2022), 5551–5575
38. Marigonda A.; **Nguyen, K.T.**: Solutions to a system of first order H-J equations related to a debt management problem, *Nonlinear Differential Equations and Applications NoDEA* **29** (2022), no.4, Paper No. 48, 34 pp
37. Bressan A.; Galtung S.T.; Grunert K.; **Nguyen, K.T.**: Shock interactions for the Burgers-Hilbert Equation, *Communications in Partial Differential Equations* **47** (2022), no. 9, 1795-1844
36. Ancona, F.; **Nguyen, K.T.**: On the global controllability of scalar conservation laws with boundary and source controls, *SIAM journal of control and optimization* **59** (2021), no. 6, 4314-4338
35. Capuani, R.; Dutta, P.; **Nguyen, K.T.**: Metric entropy for functions of bounded total generalized variation, *SIAM Journal on Mathematical Analysis* **53** (2021), no. 1, 1168-1190
34. Gilmore, S.; **Nguyen, K.T.**: SBV regularity for Burgers-Poisson equation, *Journal of Mathematical Analysis and Applications* **500** (2021), no.1., 125095, 13 pp
33. Capuani, R.; Glimore, S.; **Nguyen, K.T.**: A model of debt with bankruptcy risk and currency devaluation, *Minimax Theory and its Applications* **5** (2020), no. 2, 251–274
32. Ancona, F.; Glass, O.; **Nguyen, K.T.**: Quantitative compactness estimate for scalar conservation laws with nonconvex fluxes, (vol. 10, pp. 248-255). Hyperbolic Problems: Theory, Numerics, Application, AIMS on Applied Mathematics, *Am. Inst. Math. Sci. (AIMS), Springfield, MO,* (2020)
31. Ancona, F.; Glass, O.; **Nguyen, K.T.**: On Kolmogorov entropy compactness estimates for scalar conservation laws without uniform convexity, *SIAM Journal on Mathematical Analysis* **51** (2019), no. 4, 1131–1143
30. Bressan A.; Mazzola M; **Nguyen, K.T.**: Approximation of sweeping processes and controllability for a set valued evolution, *SIAM Journal on Control and Optimization* **57** (2019), no. 4, 2487–2514
29. Mazzola, M.; **Nguyen, K.T.**: Lyapunov's theorem via Baire category, Trends in control theory and partial differential equations, 181–194, Springer INdAM Series, 32, Springer, Cham, 2019
28. Dutta, P.; **Nguyen, K.T.**: Covering numbers for bounded variation functions, *Journal of Mathematical Analysis and Applications* **468** (2018), no. 2, 1131–1143
27. Cavagnari, G.; Marigonda, A.; **Nguyen, K.T.**; Priuli, F. S.: Generalized control systems in the space of probability measures, *Set-Valued and Variational Analysis* **8** (2018), no. 3, 663–691
26. Bressan, A.; **Nguyen, K.T.**: Stability of Feedback Solutions for Infinite Horizon Noncooperative Differential Games, *Dynamic Games and Applications* **8** (2018), no. 1, 42–78
25. Bressan, A.; Marigonda, A.; **Nguyen, K.T.**; Palladino,M: A stochastic model of optimal debt management and bankruptcy, *SIAM Journal on Financial Mathematics* **8** (2017), no. 1, 841–873
24. Ancona, F.; Cannarsa, P.; **Nguyen, K.T.**: Quantitative compactness for Hamilton Jacobi Equations, *Archive for Rational Mechanics and Analysis* 219 (2016), no. 2, 793–828
23. Ancona, F.; Cannarsa, P.; **Nguyen, K.T.**: The compactness estimates for Hamilton Jacobi Equations

depending on space, *Bulletin of the Institute of Mathematics, Academia Sinica* **11** (2016), 63–113
22. Bressan, A; **Nguyen, K.T.**: An equilibrium model of debt and bankruptcy, *ESAIM: Control, Optimisation and Calculus of Variations* **22** (2016), no. 4, 953–982.
21. Bressan, A.; Mazzola, M.; **Nguyen, K.T.**: The Bang-Bang theorem via Baire category: a dual approach, *Nonlinear Differential Equations and Applications NoDEA*, **23** (2016), no. 4, Art. 46, 9 pp
20. Grunert, K.; **Nguyen, K.T.**: Global existence of weak solutions for Burgers-Poisson equation, *J. Differential Equations*, **23** (2016), no. 4, 23–46
19. Ancona, F.; Glass, O.; **Nguyen, K.T.**: On compactness estimates for general nonlinear system hyperbolic systems, *Ann. Inst. H. Poincaré Anal. Non Lineaire* **32** (2015), no. 6, 1229–1257
18. Cannarsa, P.; Marigonda, A.; **Nguyen, K.T.**: SBV regularity of minimum time function for a class of differential inclusions, *Journal of Mathematical Analysis and Applications* **427** (2015), no.1, 202–228
17. Bressan, A.; **Nguyen, K.T.**: Optima and Equilibria for Traffic Flow on Networks with Backward Propagating Queues, *Networks & Heter. Media* **10** (2015), no. 4, 717–748
16. Bressan, A.; **Nguyen, K.T.**: Conservation Law Models for Traffic Flow on a Network of Roads, *Networks & Heter. Media* **10** (2015), no. 2, 255–292
15. Colombo, G.; **Nguyen, K.T.**; Nguyen, L.V.: Non-Lipschitz points and the SBV regularity of the minimum time function, *Calc. Var. Partial Differential Equations* (2014), no. 1–2, 439–463
14. Bressan, A.; **Nguyen, K.T.**: Global Existence of Weak Solutions for the Burgers-Hilbert Equation, *SIAM Journal on Mathematical Analysis* **46** (2014), no. 4, 2884–2904
13. Marigonda, A.; **Nguyen, K.T.**; Vittone, D.: BV regularity and differentiability properties of a class of upper semicontinuous functions, *Large Scale Scientific Computations, 116-124*, Lecture Notes in Comput. Sci., **8353**, *Springer, Heidelberg*, 2014
12. Ancona, F.; Glass, O.; **Nguyen, K.T.**: On quantitative compactness for hyperbolic system conservation laws, *Hyperbolic problems: theory, numerics, applications, 249–257*, AIMS Ser. Appl. Math., **8**, *Am. Inst. Math. Sci. (AIMS), Springfield, MO*, 2014
11. Marigonda, A.; **Nguyen, K.T.**; Vittone, D.: Some regularity results for a class of upper semicontinuous functions, *Indiana University Mathematics Journal* **62** (2013), no. 1, 45–89
10. Albano, P.; Cannarsa, P.; **Nguyen, K.T.**: Sinestrari, C.: Singular gradient flow and homotopic equivalence, *Mathematische Annalen* **356** (2013), 23–43
9. Ancona, F.; Glass, O.; **Nguyen, K.T.**: Lower compactness estimates for scalar balance laws, *Communications on Pure and Applied Mathematics* **65** (2012), no. 9, 1303–1329
8. Colombo, G.; **Nguyen, K.T.**: The minimum time function around the origin, *Mathematical Control and Related Fields* **3** (2013), no. 1, 51–82
7. **Nguyen, K.T.**; Vittone, D: Rectifiability of special singularities of non-Lipschitz functions, *Journal of Convex Analysis* **19** (2012), no. 1, 159–170
6. Cannarsa, P.; **Nguyen, K.T.**: External sphere condition and time optimal control for differential inclusions, *SIAM Journal on Control and Optimization* **49** (2011), no. 6, 2558–2576
5. Colombo, G.; **Nguyen, K.T.**: On the structure of the minimum time function, *SIAM Journal on Control and Optimization* **48** (2010), no. 7, 4776–4814
4. **Nguyen, K.T.**: Hypographs satisfying external sphere condition and the regularity of the minimum time function, *Journal of Mathematical Analysis and Applications* 372 (2010), 611–628
3. Colombo, G.; **Nguyen, K.T.**: Quantitative isoperimetric inequalities for a class of nonconvex sets, *Calc. Var. Partial Differential Equations* **37** (2010), no. 1-2, 141–166
2. Duong, M. D.; **Nguyen, K.T.**; Tran, V.H: Critical points of non-C2 functional, *Topol. Methods Nonlinear Anal.* **29** (2007), no. 1, 35–68
1. Duong, M. D.; **Nguyen, K.T.**; Tran, V.H: Morse-Palais Lemma for nonsmooth functionals on normed spaces, *Proc. Amer. Math. Soc.* **135** (2007), no. 3, 921–927

Research Presentations

Invited talks

91. Colloquium, Department of Mathematics, Michigan State University, November, 2024
90. Invited speaker, The 42th Southeastern-Atlantic Regional Conference on Differential Equations, West Virginia University, Virginia, November 9-10, 2024
89. Plenary speaker, Conference Resonances in the Mathematical World, August 1-4, 2024, Vietnam
88. Colloquium, Department of Mathematics and Statistics, UNC Charlotte, USA, April 2024
87. PDE seminar, Department of Mathematics, Penn State University, April 2024
86. Modeling, Computation, Nonlinearity, Randomness and Waves Seminar, Department of Mathematics, University of Arizona, March 2024
85. PDE seminar, Department of Mathematics, Ohio State University, March 2024
84. Actuarial Science and Quantitative Risk Management Seminar, Department of Mathematics, Ohio State University, March 2024
83. Analysis Seminar, Department of Mathematics, University of Texas at Austin, March 2024
82. Applied Math Seminar, Department of Mathematics, Baylor University, USA, February 2024
81. Analysis Seminar, Department of Mathematics, University of Oklahoma, USA, February 2024
80. Differential Equations Seminar, Department of Mathematics, University of Rome Tor Vergata, Italy, December 2023
79. Invited speaker, The 41th Southeastern-Atlantic Regional Conference on Differential Equations, Florida A&M University, Florida, November 18-19, 2023
78. Invited speaker, 2024 AWM Research Symposium, Clark Atlanta University, USA, Sep 29-Oct 01, 2023, Special Session on "Recent Developments in Control, Optimization, and the Analysis of Partial Differential Equations"
77. Invited speaker, 2023 Fall AMS sectional meeting at Bufallo, USA, Sep 9-10, 2023, Special Session on "Nonlinear PDEs in Fluids and Waves"
76. Invited speaker, The VI AMMCS International Conference , Waterloo, Ontario, Canada, August 14-18, 2023, Minisymposium on "Recent Advances in the Theory and Applications of Wave Propagation"
75. Colloquium, Department of Mathematics, Da Nang University, Vietnam, July 2023
74. Colloquium, Department of Mathematics, College of Natural Sciences, Can Tho University, Vietnam, June 2023
73. Math & Applied Sciences Seminar, Institute of Applied Mathematics, University of Economics, Vietnam, June 2023
72. Invited speaker, The 13th AIMS Conference on Dynamical Systems, May 30-June 04, 2023, Session on "Qualitative Properties and Numerical Approximations of PDE Systems which Govern Fluid Flows and Flow-Structure Interactions"
71. Invited speaker, The 13th AIMS Conference on Dynamical Systems, May 30-June 04, 2023, Session on "Control and Optimization: new developments and applications"
70. Invited speaker, Madison Workshop in PDE 2023, UW Madison, May 15-May 18, 2023
69. Invited speaker, SIAM Southeastern Atlantic Section Annual Meeting, March 25-March 26, 2023, Minisymposium on "PDEs in Fluids/Flow-Structure Interactions"
68. PDE Seminar, Department of Mathematics, University of Houston, USA, March 2023
67. Colloquium, Department of Mathematics and Statistics, UNC Charlotte, USA, September 2022
66. Colloquium, Department of Mathematics, Saigon University, Vietnam, July 2022
65. Seminar, Department of Mathematics and Statistics, Qui Nhon University, Vietnam, June 2022
64. Invited speaker, theoretical and numerical trends in inverse problems and control for PDE's, and HJ equation: French-Italian-Japanese conference, CIRM Luminy, France, June 13-17, 2022

63. Seminar, Department of Mathematics, International University - National University, Vietnam, June 2022
62. Colloquium, Department of Mathematics, University of Nebraska-Lincoln, USA, April 2022
61. PDE Seminar, Department of Mathematics, Ohio State University, USA, April 2022
60. Invited speaker, the Twelfth IMACS International Conference on Nonlinear Evolution Equations and Wave, March 30-April 01, 2022: Special Session on: "System of Hyperbolic Conservation Laws and Applications"
59. Differential Equations Seminar, Department of Mathematics, University of Rome Tor Vergata, Italy, November 2021
58. Invited speaker, SIAM Southeastern Atlantic Section at Auburn University, Sep 18-19, 2021, Minisymposium on "Recent developments on Partial Differential Equations and Applications"
57. Applied Mathematics Seminar Series, March, 2021
56. Online seminars in Analysis, Control and Inverse Problems for PDEs, Rome, Italy, December 2020
55. Colloquium, Department of Mathematics and Statistics, Loyola University Chicago, November 2020
54. Invited speaker, Fall Eastern Sectional Meeting at Penn State University, Oct 03-04, 2020: Session on "Conservation laws and nonlinear wave equations"
53. Differential Equations and Applications Seminar, Department of Mathematics, Padova University, Italy, July 2020
52. Colloquium, Department of Mathematics and Statistics, UNC Charlotte, March 2020
51. Colloquium, Department of Mathematics, Louisiana State University, February 2020
50. PDE Seminar, Department of Mathematics, Louisiana State University, February 2020
49. Invited speaker, SIAM Conference on Analysis of Partial Differential Equations, December 11-14, 2019, La Quinta, California: Session on "Nonlocal PDE in Fluid Dynamics"
48. PDE and Applied Math Seminar, Department of Mathematics, University of California, Riverside, December 2019
47. Colloquium, Department of Mathematics and Statistics, UNCC, Charlotte, March 2019
46. CAM Colloquium, PSU Mathematics Department, State College, March 2019
45. Stochastic Seminar, University of Colorado, Boulder, October 2018
44. Invited speaker, Workshop on Nonlinear Differential Equations, Dynamical Systems and Applications, University of Kansas, Lawrence, October 20-21, 2018
43. Invited speaker, 2018 SIAM Louisiana-Texas Section Conference, Oct 5-7, 2018: Session on Nonlinear conservation laws and applications
42. Invited speaker, International workshop on Hyperbolic and Kinetic Problems: Theory and Applications, Institute of Mathematics, Academia Sinica, Taipei, Taiwan, July 10-14, 1014, 2018
41. Invited speaker, The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, July 5-9, 2018, Taiwan, Special Session on "Control and Optimization: new developments and applications"
40. Invited speaker, The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, July 5-9, 2018, Taipei, Taiwan, Special Session on "Viscosity solutions: beyond the well-posedness theory"
39. Invited speaker, SAMSI workshop on Operator Splitting Methods in Data Analysis, North Carolina, USA, March 21-23, 2018
38. PDE GA Seminar - UW-Madison Math Department, March 2018
37. Differential Equations/Nonlinear Analysis Seminar, NC State University, February 2018
36. Invited speaker, The 42nd SIAM Southeastern Atlantic Sectional Conference, UNC Chapel Hill, NC, March 9-11, 2018, Minisymposium on"Nonlinear PDEs and Control"
35. Invited speaker, The IV AMMCS International Conference , Waterloo, Ontario, Canada, August 20-25, 2017, Minisymposium on "Recent Advances in Mathematical and Computational Aspects of Wave

Propagation"

34. Plenary speaker, Mathematical Conference: "Summer Meeting 2017", July 21-22, 2017, Ho Chi Minh, Vietnam
33. Invited speaker, Frontiers of Interdisciplinary Mathematics, May 9–11, 2017, Department of Mathematics, Penn State University, USA
32. Analysis Seminar, University of Natural Sciences, Ho Chi Minh, Vietnam, May 2017
31. Invited speaker, AMS Sectional Meeting at the College of Charleston, March 10-12, 2017, Special Session on "Analysis, Control and Stabilization of PDEs"
30. Invited speaker, AMS Sectional Meeting at the College of Charleston, March 10-12, 2017, Special Session on "Nonlinear Waves: Analysis and Numerics"
29. DE Seminar, Department of Mathematics, NCSU, USA, November 2016
28. Mathematics seminar, North Carolina State University, January 2016
27. Special Seminar, National University of Singapore, Singapore, January 2016
26. Colloquium, Department of Mathematics, Tulane University, USA, November 2015
25. Special seminar, Scuola Normale Superiore di Pisa in Italy, December 2015
24. Analysis seminar, University of Natural Sciences, Ho Chi Minh, Vietnam, May 2015
23. PDE seminar, The University of Tennessee, Knoxville, USA, April 2015
22. PDE seminar, Department of Mathematics, Indiana University Bloomington, USA, March 2015
21. Special Seminar, Department of Mathematics and Statistics, Loyola University, USA, February 2015
20. Special Seminar, Department of Applied Mathematics, University of Waterloo, Canada, February 2015
19. Invited speaker, "Entropy and Singular Solutions for Conservation Laws: Pressureless Gas Dynamics and Other Applications", Conference on the mathematical theory of conservation laws at West Virginia University, September 26–28
18. Seminar of Hyperbolic and Mixed Type PDEs, PSU Mathematics Department, February 2014
17. Plenary speaker, Mathematical Conference: "Summer Meeting 2014", August 10-11, 2014, Ho Chi Minh, Vietnam
16. Invited speaker, Conference on "New Trends in Optimal Control", June 23–27, 2014, Tours, France
15. Invited speaker, Workshop "Analysis and Geometry in Control Theory and its Applications", June 9–13, 2014, INDAM, Rome, Italy
14. Differential Equations and Applications Seminar, Department of Mathematics, Padova University, Italy, June 2014
13. Invited speaker, the meeting "Differential Equations, Inverse Problems and Control Theory", Cortona, Italy, June 17–21 2014
12. Functional Analysis and Applications Seminar, International School for Advanced Studies (S.I.S.S.A), Trieste, Italy, May 2014
11. Mathematics seminar, Department of information Engineering, Computer Science and Mathematics, University of L'Aquila, Italy, April 2013
10. Mathematics seminar, Department of Mathematics and Computer Sciences, University of Verona, December 2012
9. Analysis seminar at the University of Natural Sciences, Ho Chi Minh, Vietnam, July 2012
8. Mathematics seminar, Department of Mathematics, University of Rome "Tor Vergata", March 2012
7. Mathematics seminar, Tan Tao University, Ho Chi Minh, Vietnam, January 2012
6. Analysis Seminar, University of Natural Sciences, Ho Chi Minh, Vietnam, December 2011
5. Invited speaker, The SADCO Summer School and Workshop on Control and Optimization, Imperial College, London, September 5–9, 2011
4. Functional Analysis and Applications Seminar, International School for Advanced Studies (S.I.S.S.A), Trieste, Italy, April 2011

3. Invited speaker, Workshop on "Calculus of Variations and Partial Differential Equations", Department of Mathematics "Ulisse Dini", Firenze, Italy, January 23–24, 2009
2. Differential Equations and Applications Seminar, Department of Mathematics, Padova University, Italy, November 2009
1. Differential Equations and Applications Seminar, Department of Mathematics, Padova University, Italy, October 2008

Contributed Talks

9. 39th Southeastern-Atlantic Regional Conference on Differential Equations, Embry-Riddle Aeronautical University, Daytona Beach, Florida, October 26-27, 2019
8. XVII International Conference on Hyperbolic Problems, Theory, Numerics, Applications, University Park, Pennsylvania, USA, June 25-29, 2018
7. The IV AMMCS International Conference, Waterloo, Ontario, Canada, August 20-25, 2017, Minisymposium on "Optimal Control and Differential Games"
6. The 17th SIAM Conference on Control and Its Application, Pittsburgh, Pennsylvania, USA, July 10–12, 2017, Minisymposium on "Qualitative and Asymptotic Properties of Solutions to Hamilton-Jacobi Equations"
5. The 46th Barrett Lectures on "Modeling and Analysis of Nonlinear PDEs in spatial Ecology", The University of Tennessee, Knoxville, USA, May 16–18, 2016
4. Workshop on Interdisciplinary Mathematics, PSU mathematics departments, USA, May 8–10, 2015
3. The 14th international conference on hyperbolic problems: Theory numerics and Applications, University of Padova, Italy, June 25–29, 2012
2. "Nonlinear Wave Equations", Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations Trimester at S.I.S.S.A, Trieste, Italy, May 2011
1. C.I.M.E summer school on "Control of Partial Differential Equation", Italy, July 19–23, 2010

Local Seminar Presentations

8. Probability Seminar, Department of Mathematics, NCSU, USA, December 2023
7. First year Seminar, Department of Mathematics, NCSU, USA, March 2023
6. The graduate program virtual open house, NCSU, 2021
5. Faculty Research Presentations, Weekend Retreat for Prospective Graduate Students, NCSU, 2019
4. Differential Equations/Nonlinear Analysis Seminar, NCSU, October 2018
3. First year Seminar, Department of Mathematics, NCSU, USA, March 2018
2. First year seminar, Department of Mathematics, NCSU, USA, Oct 2016
1. PhD seminar, Department of Mathematics, Padova University, Italy, November 2010

TEACHING

Teaching Awards

- Spring 2022 Recipient of "Thank a Teacher" Letter, NCSU
- 2021 John Franke Faculty Award for Teaching, NCSU
- Fall 2019 Recipient of "Thank a Teacher" Letter, NCSU
- Spring 2019 Recipient of "Thank a Teacher" Letter, NCSU
- Fall 2018 Recipient of "Thank a Teacher" Letter, NCSU
- Spring 2018 Recipient of "Thank a Teacher" Letter, NCSU
- Fall 2017 Recipient of "Thank a Teacher" Letter, NCSU

- Spring 2017 Recipient of "Thank a Teacher" Letter, NCSU

Advising and Mentoring

Postdocs

- 2024 – present Madhumita Roy
- 2021 – 2023 Schino Jacopo (Assistant Professor, University of Warsaw)
- 2019 – 2020 Rossana Capuani (Visiting Assistant Professor, The University of Arizona)

Graduate students

- 2022 – present Evangelia Ftaka (2025 Expected Graduation)
- 2021 – present Andrew Murdza (2025 Expected Graduation)
- 2017 – 2021 Prerona Dutta (Arnold Ross Assistant Professor, Ohio State University, Ohio, USA)
- 2018 – 2021 Steven Glimore (Mindspire Tutoring & Test Prep, NCSU, USA)
- 2018 – 2020 Ethan King (Artificial Intelligence & Mathematical Modeling Data Scientist at Pacific Northwest National Laboratory, Washington, USA)

Undergraduate students

- Spring 2023 Etienne Phillips (**Undergraduate** research - Project on "A quantitative version of Sard's theorem", Supported by NSF - Grant No. DMS - 2154201)
- Spring 2019 Adithya Kasali (**Undergraduate** research - Project on "Optimal harvesting of renewable natural resources")
- Fall 2017 Barnes Carrie Lee (**Undergraduate** research, project on "A model of optimal pest control", sponsored by PEP ($1000))
- Summer 2016 Connor Dane Cassady and Samuel Slocum (**REU** project)
- 2014 – 2015 Tu Nguyen Thai Son (Visiting Assistant Professor, Michigan State University, USA)
- Summer 2014 Karim Khalil, Mohmmad Ganber, and Kevin Dastalfo (**REU** project)
- 2016 – present Faculty Teaching Mentor and Observer for the following Teaching Assistants: Kristen Moody, Chetak Hossain, Steve Gilmore, Sarah Kathryn Spencer, Erica Swain, Prerona Dutta

Additional PhD student mentoring: I have been the academic advisor of 4 PhD students providing comprehensive mentoring that started the summer before they joined NCSU until they identify a research topic and find a research advisor

- 2023 – present Nate Brockmann (**MS.** Student)
- 2023 – present Jacob Gordon (**Ph.D.** Student)
- 2022 – present Paul Spears (**Ph.D.** Student)
- 2021 – 2022 Matthew Broussard and Andrew Shedlock (**Ph.D.** Student)
- 2020 – 2021 Andrew Murdza (**Ph.D.** Student)

Courses Taught

1. Associate Professor, NC State University

   - Analysis II (MA 715), graduate class, Spring 2022, Spring 2021, Spring 2019, Spring 2018
   - Analysis I (MA 515), graduate class, Fall 2024, Fall 2021, Fall 2020, Fall 2019, Fall 2018, Fall 2017
   - Dynamic Systems and Multivariable Control I (MA 531), graduate class, Fall 2023, Fall 2022
   - Applied Differential Equations II (MA 401), undergraduate class, Fall 2023, Fall 2022, Fall 2021, Fall 2020, Fall 2019, Fall 2018, Fall 2017, Spring 2017, Fall 2016

– Problem Solving Strategies for Competitions (MA 444), undergraduate class, Fall 2024, Fall 2023, Fall 2022, Fall 2021, Fall 2020, Fall 2019, Fall 2018
– Viscosity solutions (MA 793), graduate class, Fall 2019
– Reading in Honors Mathematics (MA 491), undergraduate class, Spring 2019
– Independent Research in Mathematics (MA 499), undergraduate class, Fall 2017

New Course Design:

– Viscosity solutions (MA 793), graduate class, Fall 2019: A new Special Topics class on viscosity solutions (an important area that until recently was not sufficiently covered in any graduate course at NCSU) to Mathematics and Applied Mathematics PhD students. The course covered topics in nonsmooth analysis, geometric measure theory, optimal control and conservation laws, and gave a flavor of the many fields of application of the theory. The students in the class were taught the basic theory of weak solutions for first-order Hamilton-Jacobi Equations and conservation laws to approach current research in the area.

2. S. Chowla Assistant Professor, Penn State University

– Calculus with Analytic Geometry II (Math 141), undergraduate class, Fall 2015
– Ordinary and partial differential equations (Math 251), undergraduate class, Fall 2014, Spring 2014, Fall 2013

3. Research Experiences for undergraduates (REU)

– Tutorial, introduction to control theory, Summer 2015
– Tutorial, introduction to control theory, Summer 2013

4. Invited Courses

– Principle lecturer, 4 lectures on "Introduction to optimal control theory and Hamilton-Jacobi equations", Summer School in PDE and Applications 2024, Saigon University, Vietnam
– A short course on "Optimal control problems and Hamilton-Jacobi equations", University of Natural Sciences, Ho Chi Minh, Vietnam, Summer 2017
– PhD course, Topics on optimal control and PDEs (22 hours), Department of Pure and Applied Mathematics, University of Padova, Italy, 2013
– Master course, Topics on optimal control and PDEs (45 hours), University of Natural Sciences, Ho Chi Minh, Vietnam, Spring 2013

Others

- 2016 – present Faculty Teaching Mentor and Observer for the following Teaching Assistants: Andrew Murdza, Kristen Moody, Chetak Hossain, Steve Gilmore, Sarah Kathryn Spencer, Erica Swain, Prerona Dutta, Thuy Le
- 2016 – present Peer Teaching Reviews for Prof. Ryan Murray, Prof. Lorena Bociu and Prof. Hien Tran

SERVICE - Professional Service on NCSU Campus

Ph.D. and Masters Committee Memberships

- PhD Committee Member: Javier Madariaga Roman (Mathematics)
- PhD Committee Member: Diego Cornejo (Mathematics)

- PhD Committee Member: Adam Pickarski (Applied Mathematics)
- PhD Committee Member: Rachel Morris (Applied Mathematics)
- PhD Committee Member: Moritz Woelk (Chemical Engineering)
- PhD Committee Member: Nikki Xu (Applied Mathematics)
- Ph.D. Committee Member: Matthew Broussard (Applied Mathematics)
- Ph.D. Committee Co-Chair: Evangelia Ftaka (Mathematics)
- Ph.D. Committee Chair: Andrew Murdza (Mathematics)
- Ph.D. Committee Member: Fallah Amirhassan (Electrical Engineering)
- Ph.D. Committee Member: Sarah Strikwerda (Applied Mathematics, graduated Spring 2023)
- Graduate School Representative: Yvotte Brits (Nuclear Engineering)
- Ph.D. Committee Member: Lindsey Farris (Mathematics, graduated Summer 2022)
- Ph.D. Committee Member: Elisabeth Congdon (Applied Mathematics, graduated Summer 2022)
- Ph.D. Committee Member: Minh Bui (Mathematics, graduated Summer 2021)
- Ph.D. Committee Co-Chair: Steven Gilmore (Applied Mathematics, graduated Summer 2021)
- Ph.D. Committee Chair: Prerona Dutta (Mathematics, graduated Summer 2021)
- Ph.D. Committee Member: Yahe Yu (Applied Mathematics, graduated Fall 2020)
- Ph.D. Committee Member: Ankit Kumar (Physics, graduated Summer 2020)
- Ph.D. Committee Co-Chair: Ethan King (Applied Mathematics, graduated Spring 2020)
- M.S. Committee Member: Farid Benmouffok (Mathematics, graduated Fall 2020)
- Ph.D. Committee Member: Andrew Bernstein (Applied Mathematics, graduated Fall 2019)
- Ph.D. Committee Member: Karlan Wolfkill (Applied Mathematics, graduated Fall 2018)
- Ph.D. Committee Member: Amanda Bernstein (Applied Mathematics, graduated Summer 2018)

Departmental Committees

- Department Postdoc Hiring Committee (2023-2024)
- Department Hiring Committee (Nonlinear Analysis) (2022-2023)
- Department Hiring Committee (Mathematical Analysis and Applications), 2019-2020
- Department Hiring Committee (Financial Math), 2017-2018 and 2019-2020
- Department Hiring Committee (Nonlinear Analysis and Differential Equations), 2018-2019
- Department Faculty Advisory Committee (FAC), 2023- Present
- Department Personnel Evaluation Committee (PEC), 2022- Present
- Department Undergraduate Math Competition Committee, (Co-chair) 2017-2019, (Chair) 2019-2021, (Co-chair) 2021-present
- Department Ph.D. Preliminary Exam Committee, 2017-Present
- Department Mathematics Distinguished Lecture Series Committee, 2020-2022
- Department Undergraduate Recruitment Committee, 2020-2021
- Department Graduate Admission Committee, 2019-2020, 2024-2025
- Department Publicity and Outreach committee, 2017-2018
- Graduate Faculty Member, 2016-present
- Organizer for the DE Seminar, 2016-present
- Organizer for Nonlinear Analysis Seminar, 2017-present
- Co-founder of the Nonlinear Analysis Thematic Group

SERVICE - Professional Service of Campus

NSF panelist: 2023, 2024

Editorial Board and Referee Activity

- Editor of Journal of Dynamical and Control Systems, 2016-present
- Review Editor for Frontiers for Young Minds, 2017-2023
- Referee for several journals in Analysis, Differential Equations, Dynamical Systems, Control Theory and Optimization, Game Theory:

  Archive for Rational Mechanics and Analysis (ARMA), SIAM Journal on Control and Optimization (SICON), SIAM Journal on Applied Mathematics (SIAP), SIAM Journal on Mathematical Analysis (SIMA), Communications on Pure and Applied Analysis (CPAA), ESAIM: Control, Optimisation and Calculus of Variations (ESAIM: COCV), Nonlinear Differential Equations and Applications (NODEA), AIMS Mathematical Control and Related Fields (MCRF), AIMS Networks and Heterogeneous Media (NHM), AIMS Discrete and Continuous Dynamical Systems (DCDS), Journal of Convex Analysis, IEEE Transactions on Information Theory, Neural Processing Letters, Results in Mathematics (RIMA), AIMS Mathematics, MRP Journal of Abstract Differential Equations and Applications (JADEA), Math Reviews

Organized Conferences

• Organizer for the 39th Southeastern-Atlantic Regional Conference on Differential Equations (SEARCDE) - Funded by NSF, NC State University, November 12–13,2022

• Annual program committee of the Mathematical Conference: "Summer Meeting", University of Sciences, Ho Chi Minh city, Vietnam, 2017-2019

• Organizer of 7 conferences, 3 special sessions and 4 mini-symposia at national and international meetings, 2015-present:

- The Mathematical Conference: "Summer Meeting 2024", Saigon University, Ho Chi Minh city, Vietnam, July 05-06, 2024
- A minisymposium on "Optimal Control, Games, and Applications", The VI AMMCS International Conference, Waterloo, Ontario, Canada, August 14-18, 2023
- A virtual Mathematical Conference: "Summer Meeting 2023", June 24-25, 2023.
- A special session on "Recent Advances in Differential Equations and Applications", SIAM Southeastern Atlantic Section Annual Meeting, March 25-26, 2023, Virginia Tech,
- The Mathematical Conference: "Summer Meeting 2022", Saigon University, Ho Chi Minh city, Vietnam, July 30-31, 2022
- A virtual Mathematical Conference: "Summer Meeting 2021", July 24-25, 2021.
- The Mathematical Conference: "Summer Meeting 2019", University of Sciences, Ho Chi Minh city, Vietnam, July 27-28, 2019
- A minisymposium on "Optimal Control, Games, and Applications", The V AMMCS International Conference, Waterloo, Ontario, Canada, August 18-23, 2019
- The Mathematical Conference: "Summer Meeting 2018", University of Sciences, Ho Chi Minh city, Vietnam, July 12-13, 2018
- A special session on "Optimal control and differential games: Recent developments in theory and applications", the 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan, July 05-09, 2018
- A minisymposium on "Topics in Nonlinear PDEs and Applications", 42nd SIAM Southeastern Atlantic Sectional Conference, UNC Chapel Hill, NC, USA, March 9-11, 2018
- The Mathematical Conference: "Summer Meeting 2017", University of Sciences, Ho Chi Minh city, Vietnam, July 22-23, 2017
- A special session on "Conservation Laws, Nonlinear Waves and Applications", Fall Western Sectional Meeting, November 04-05, 2017

- A minisymposium on "Optimal control and differential games", The IV AMMCS International Conference, Waterloo, Ontario, Canada, August 20-25, 2017
- A minisymposium on "Qualitative and Asymptotic Properties of Solutions to Hamilton-Jacobi Equations", 2017 SIAM Conference on Control and Its Application, Pittsburgh, Pennsylvania, USA, July 10-12, 2017
- The Mathematical Conference: "Summer Meeting 2016", University of Sciences, Ho Chi Minh city, Vietnam, July 23-24, 2016
- A special session on on "Control, Optimization, and Differential Games", AMS Meeting in Raleigh, November 12-13, 2016
- The Mathematical Conference: "Summer Meeting 2015", University of Sciences, Ho Chi Minh city, Vietnam, August 08-09, 2015

• Participated to organize the fourteenth international conference on hyperbolic problems: Theory numerics and Applications, University of Padova, Italy, June 25-29, 2012

Outreach Activity, Recognition, and Others

- Review Editor for Frontiers for Young Minds, 2017-2024
- Served in a panel on Job Interview, NCSU, 2022
- Hosting "Problem Solving Sessions" for NCSU Putnam students, 2019-present
- One hour of interview at "Toan0Mau" channel for Vietnamese mathematic students, 2020
- Developed the "Problem Solving Session" exhibit at the 130th Math Department Anniversary Celebration, NCSU, 2019
- Participated in "Math Doesn't bug Me", NC Museum of Natural Sciences, 2019
- Co-organized "Math Doesn't bug Me", COS State of the Sciences, 2018
- Co-organized "Math Doesn't bug Me", NC Museum of Natural Sciences, 2017
- Panel for Prospective Students, Department of Mathematics, NCSU, 2018
- Invited speech in the welcoming party for freshmen of Ph.D. program, Department of Mathematics, University of Padova, 2011
- Served in the Admission Committee of the Masters Program in Mathematics at the University of Verona, Italy, 2017-2021
- Annual program committee of the Mathematical Conference: "Summer Meeting", University of Sciences, Ho Chi Minh city, Vietnam, 2015-2019
- External consultant for the admission committee of the Masters Program in Mathematics at the University of Verona, Italy, 2016
- Coordinator for the 48^{th} International Mathematical Olympiad (IMO), Vietnam, 2007