Dr. Muhammad Mohebujjaman

Contact Information

Address	4045 University Hall, UAB Birmingham, AL 35294	Email	mmohebuj@uab.edu
Phone	(205) 934-2154	Website	https://tinyurl.com/4uc6d23v
citizenship	U.S. Permanent Resident	Google Scholar profile	https://goo.gl/9r8D9h # citations: 619, h-index: 13, i10-index: 13

Education

Ph.D. ***Applied and Computational Mathematics,*** 2017, Clemson University (CU), USA
Dissertation: *Efficient Numerical Methods for Magnetohydrodynamic Flow*
Concentration: Applied and Computational Mathematics
Advisor: Dr. Leo G. Rebholz, Professor, Co-advisor: Dr. Timo Heister, Associate Professor, Department of Mathematical and Statistical Sciences, CU, Clemson, SC

M.S. ***Applied and Computational Mathematics,*** 2015, Clemson University, USA
Project: *Linear Solvers for Saddle Point Problems Arising in Navier-Stokes Simulations.* Advisor: Dr. Leo G. Rebholz, Professor, Department of Mathematical and Statistical Sciences, CU, Clemson, SC

M.S. ***Applied Mathematics,*** 2009, University of Dhaka (UD), Dhaka, Bangladesh
Thesis: *MHD Heat and Mass Transfer Flow Along a Stretching Sheet with Heat Generation/Absorption.* Advisor: Dr. Abdus Samad, Professor, Department of Applied Mathematics, UD, Dhaka, Bangladesh. First Class (ranked 1st out of 11 thesis students)

B.S. Honors in ***Mathematics,*** 2006, University of Dhaka, Dhaka, Bangladesh
Project: *Perturbation Methods in Aero-fluid Dynamics*, Minor: Statistics and Computer Science, Advisor: Dr. Abdus Samad, Professor, Department of Applied Mathematics, UD, Dhaka, Bangladesh. First Class (ranked 1st out of 64 students)

Employment

2023-Present ***Assistant Professor*** (Tenure-track), *Department of Mathematics*, University of Alabama at Birmingham (UAB), Birmingham, AL.

2020-2023 ***Assistant Professor*** (Tenure-track, Passed Mid-point Review), *Department of Mathematics & Physics, Texas A&M International University (TAMIU)*, Laredo, TX.

2019-2020 ***Post-doctoral Associate****, Plasma Science and Fusion Center, Massachusetts Institute of Technology (MIT)*, Cambridge, MA, USA. Advisors: Dr. Brian Labombard, Dr. John Wright and Dr. Syunichi Shiraiwa (Princeton University).

2018-2019 ***Post-doctoral Fellow****, Department of Biomedical Engineering and Mechanics, Virginia Tech*, Blacksburg, VA, USA. Advisor: Dr. Raffaella De Vita.

2017-2019 ***Caldwell Post-doctoral Fellow (Visiting Assistant Professor)****, Department of Mathematics, Virginia Tech*, Blacksburg, VA, USA. Advisor: Dr. Traian Iliescu.

2012-2017 ***Graduate Teacher of Record***, *Clemson University*, Department of Mathematical Sciences, Clemson, SC, USA.

2014-2015 ***NSF Supported Graduate Research Assistant***, *Clemson University*, Department of Mathematical Sciences, Clemson, SC, USA.

2010-2012 ***Lecturer*** (Tenure-track), *Bangladesh University of Engineering and Technology (BUET)*, Department of Mathematics, Dhaka, Bangladesh.

Employment

Fall 2011	***Adjunct Lecturer***, *Manarat International University*, Department of Business, Dhaka, Bangladesh
Spring 2011	***Adjunct Lecturer***, *United International University,* Department of Business, Dhaka, Bangladesh.
2009-2010	***Lecturer in Mathematics*** (Tenure-track), *Southeast University*, Department of Textile Engineering, Dhaka, Bangladesh.
2008-2009	***Lecturer in Mathematics*** (Tenure-track), *University of Information Technology and Sciences (UITS)*, Department of Computer Science and Engineering, Dhaka, Bangladesh.

Grant Proposals/Funding

Funded:

1. National Science Foundation (NSF), DMS-2213274, Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences (LEAPS-MPS): Fast and Efficient Novel Algorithms for MHD Flow Ensembles, Amount: $248,180, Period: 08/01/2022-07/31/2024, Role: **PI: Mohebujjaman** (100% effort).
2. Texas A&M International University, University Research Grant (URG), Amount: $\$10,000$, Period: 09/01/2022-7/31/2023, Role: **PI: Mohebujjaman** (100% effort).
3. Texas A&M International University, Faculty Seed Grant, Amount: $\$6,000$, Period: 08/15/2020-07/31/2021, Role: **PI: Mohebujjaman** (100% effort).
4. Department of Mathematics, Virginia Tech, Travel Fund Award, Amount: $10,000, Period: 8/10/2017-7/31/2019.

Not Funded:

1. Laredo Area Community Foundation Board of Directors, Laredo, TX, COVID-19 Lockdown Affect on University Students' Daily Life, Amount: $\$10,000$, Period: 01/01/2021-12/30/2021, Role: **Co-PI**, PI: Hongwei Wang.
2. NSF Collaborative Research: Transforming Reduced Order Models of Fluids with Data-Driven Correction, Data Assimilation, and Enhanced Discrete Physics, Amount $202,993, Period: 01/01/2018-12/31/2019, Role: **Co-PI**, PI: Traian Iliescu.
3. NSF Collaborative Research: Data-Driven, Physically-Accurate, Filtered Reduced Order Modeling for Nonlinear Systems, Amount $206,105, 01/01/2017-12/31/2018, Role: **Co-PI**, PI: Traian Iliescu.

Masters Graduate Students Mentored

1. Julian V. Miranda (thesis supported by NSF DMS-2213274 grant), TAMIU, 2023.
2. M.S. Hossain (co-advised with Abdus Samad), University of Dhaka, 2011.

Undergraduate Student Mentored

1. Clarisa Buenrostro (Senior), Undergraduate thesis, TAMIU, 2022.
2. Julian V. Miranda, TAMIU, 2022.

Research Interests

Numerical analysis/methods, large-scale simulation of fluid flow problems including Newtonian Navier-Stokes equations, Magnetohydrodynamics (MHD), uncertainty quantification (UQ), fast algorithms, reduced order modeling (ROM), large-scale parallel implementation of fluid flow problems using deal.II (massively parallel), and large-scale parallel simulation of Maxwell equations with multi-billion degrees of freedom.

Journal Publications

30. Decoupled algorithms for non-linearly coupled reaction-diffusion competition model with harvesting and stocking, **M. Mohebujjaman***, C. Buenrostro, M. Kamrujjaman, T. Khan, Journal of Computational and Applied Mathematics, 436, 115421, 2024. Preprint: https://arxiv.org/pdf/2209.14144.pdf
29. Scalability analysis of direct and iterative solvers used to model charging of superconducting pancake solenoids, **M. Mohebujjaman***, S. Shiraiwa, B. LaBombard, J. Wright, and K. K. Uppalapati, Engineering Research Express, 5(1), 015045, 2023.
28. High order efficient algorithm for computation of MHD flow ensemble, **M. Mohebujjaman***, Advances in Applied Mathematics and Mechanics, 14 (5), 1111-1137, 2022.
27. An efficient algorithm for parameterized magnetohydrodynamic flow ensembles simulation, **M. Mohebujjaman***, H. Wang, L. Rebholz, and M. A. A. Mahbub, Computers and Mathematics with Applications, 112, 167-180, 2022.
26. Commutation Error in Reduced Order Modeling of Fluid Flows, B. Koc, **M. Mohebujjaman**, C. Mou, and T. Iliescu, Advances in Computational Mathematics, 45, 2587-2621, 2019.
25. An evolve-filter-relax stabilized reduced order stochastic collocation method for the time-dependent Navier-Stokes Equations, M. Gunzburger, T. Iliescu, **M. Mohebujjaman***, and M. Schneier, SIAM/ASA Journal on Uncertainty Quantification, 7(4), 1162-1184, 2019.
24. Physically-Constrained Data-Driven Correction for Reduced Order Modeling of Fluid Flows, **M. Mohebujjaman***, L. G. Rebholz, and T. Iliescu, International Journal for Numerical Methods in Fluids, 89(3), 103-122, 2019.
23. Data-Driven Filtered Reduced Order Modeling of Fluid Flows, X. Xie, **M. Mohebujjaman**, L.G. Rebholz, and T. Iliescu, SIAM Journal on Scientific Computing, 40(3), B834-B857, 2018.
22. Energy Balance and Mass Conservation in Reduced Order Models of Fluid Flows, **M. Mohebujjaman**, L.G. Rebholz, X. Xie, and T. Iliescu, Journal of Computational Physics, 321, 128-142, 2017.
21. High order algebraic splitting for magnetohydrodynamics simulation, M. Akbas, **M. Mohebujjaman**, L. Rebholz, and M. Xiao, Journal of Computational and Applied Mathematics, 321, 128-142, 2017.
20. Decoupled, unconditionally stable, higher order discretizations for MHD flow simulation, T. Heister, **M. Mohebujjaman** and L. G. Rebholz, Journal of Scientific Computing, 71(1), 21-43, 2017.
19. An efficient algorithm for computation of MHD flow ensembles, **M. Mohebujjaman** and L. G. Rebholz, Computational Methods in Applied Mathematics, 17(1), 121-137, 2017.
18. An optimally accurate discrete regularization for second order timestepping methods for Navier-Stokes equations, N. Jiang, **M. Mohebujjaman**, L. Rebholz and C. Trenchea, Computer Methods in Applied Mechanics and Engineering, 310, 388-405, 2016.

17. Numerical analysis and testing of a fully discrete, decoupled penalty-projection algorithm for MHD in Elsässer variable, M. Akbas, S. Kaya, **M. Mohebujjaman** and Leo G. Rebholz, International Journal of Numerical Analysis and Modeling, 13(1), 90-113, 2016.
16. Heat and Mass Transfer of an MHD Forced Convection Flow Along a Stretching Sheet with Chemical Reaction, Radiation and Heat Generation in Presence of Magnetic Field, M.S. Hossain, M.A. Samad and **M. Mohebujjaman**, International Journal of Physics and Research, 1(1), 30-58, 2011.
15. MHD Heat and Mass Transfer Free Convection Flow Along a Stretching Sheet with Suction when Buoyancy Opposes the Flow, **M. Mohebujjaman*** and M. A. Samad, GANIT: Journal of Bangladesh Mathematical Society, 30, 76-88, 2010.
14. MHD Heat Transfer Mixed Convection Flow Along a Vertical Stretching Sheet in Presence of Magnetic Field With Heat Generation, **M. Mohebujjaman***, Tania S. Khaleque and M. A. Samad, International Journals of Basic and Applied Sciences IJBAS-IJENS, 10(2), 133-142, 2010.
13. Magnetohydrodynamic Heat and Mass Transfer Forced Convection Flow Along a Stretching Sheet with Heat Generation/ Absorption. M. A. Samad, **M. Mohebujjaman**, M. Mustak Mia and M. A. Rahman, Dhaka University Journal of Science, 58(1), 91-96, 2010.
12. MHD Heat and Mass Transfer Free Convection Flow along a Vertical Stretching Sheet in Presence of Magnetic Field with Heat Generation. M. A. Samad and **M. Mohebujjaman***, Research Journal of Applied Science, Engineering and Technology, 1(3), 98-106, 2009.

Collaborative Research

11. Two-grid Stabilized Lowest Equal-Order Finite Element Method for the Dual-Permeability-Stokes Fluid Flow Model, M. N. Haque, N. J. Nasu, M. A. A. Mahbub, and **M. Mohebujjaman**, submitted.
10. Predators Threat to Prey Species Depletion and Extinction: Analysis of a Biological System, M. Kamrujjaman, M. M. I. Y. Adan, M. M. Molla, and **M. Mohebujjaman**, submitted.
9. MHD Mixed Convection of Non-Newtonian Bingham Nanofluid in a Wavy Enclosure with Temperature-Dependent Thermophysical Properties: A Sensitivity Analysis by Response Surface Methodology, A. Hossain, M. M. Molla, M. Kamrujjaman, **M. Mohebujjaman**, and S.C. Saha, Energies, 16(11), 2023.
8. The interplay of harvesting and growth rate for spatially diversified populations and testing of a decoupled scheme, M. M. I. Y. Adan, M. Kamrujjaman, M. M. Molla, **M. Mohebujjaman**, and C. Buenrostro, Mathematical Biosciences and Engineering, 20(4), 6374-6399, 2023.
7. Dynamics of heterogeneous population due to spatially distributed parameters and an ideal free pair, I. Zahan, M. Kamrujjaman, M. A. Alim, **M. Mohebujjaman**, T. Khan, Frontiers in Applied Mathematics and Statistics, 8, 1-23, 2022.
6. How are BMI, Nutrition, and Physical Exercise Related? An Application of Ordinal Logistic Regression, H. Wang, F. G. Quintana, Y. Lu, **M. Mohebujjaman**, and K. Kamronnaher, Life, 12 (2098), 2022.
5. Spatio-temporal Solutions of a Diffusive Directed Dynamics Model with Harvesting, M. Kamrujjaman, K. N. Keya, U. Bulut, M. R. Islam, and **M. Mohebujjaman**, Journal of Applied Mathematics and Computing, 69, 603-630, 2023.
4. How did COVID-19 lockdown affect Hispanic University students daily life? H. Wang, **M. Mohebujjaman**, M. Villarreal, A. Ho, and F. G. Quintana, American Journal of Research in Medical Sciences, 7(1), 1-6, 2022. doi: 10.33425/2832-4226/22003

3. Vaccine efficacy and SARS-CoV-2 control in California and USA during the 2020-2026: A modeling study, M. S. Mahmud, M. Kamrujjaman, M. M. I. Y. Adan, M. A. Hossain, S. Ahmed, M. M. Rahman, M. S. Islam, **M. Mohebujjaman**, and M. M. Molla, Infectious Disease Modelling, 7(1), 62-81, 2022.
2. Informative Motif Detection Using Data Mining, F. A. Hoque, **M. Mohebujjaman*** and N. Noman, Research Journal of Information Technology, 3(1), 26-32, 2011.
1. Numerical Study of Magnetohydrodynamic Forced Convective Flow of a Micropolar Fluid past a Non-linear Stretching Sheet with Variable Viscosity. M. A. Rahman, M. A. Samad, M.M. Rahman and **M. Mohebujjaman**, Dhaka University Journal of Science, 57(2), 243-248, 2009.

(* = corresponding author, students' names are underlined)

Not Peer-Reviewed

2. On characterizing and simulating porous media W. L. Gore and Associates, P. Sanaei, V. Ciocanel, S. Bohun, C. Breward, P. Dubovski, D. Schwendeman, H. Yaple, S. Ahmed, J. Batista, M. Hennessey, T. Hueckel, S. Iyaniwura, F. Meng, **M. Mohebujjaman**, Y. Qian, D. Serino, O. Shonibare, S. Hill, B. Tille, D. Rumschitzki, C. Bi, J. Sexton, Y. Chen, J. Duan, T. Gu, Q. Wang, D. Duffy, and M. Zyskin. Preprint: https://tinyurl.com/d6yj43be
1. C++ parallel implementation of incompressible viscous time-dependent NSE simulation using projection method in Dealii, **M. Mohebujjaman**. Preprint: https://tinyurl.com/2crrhpdk

Honors and Awards

1. $248,180, **PI**, National Science Foundation early career award.
2. $10,000, **PI**, University Research Grant award for 2022–2023, TAMIU.
3. One Year Credit towards tenure, TAMIU.
4. $10,000 travel support, Department of mathematics, Virginia Tech, Blacksburg, VA.
5. Patricia Ann Caldwell Post-Doctoral Fellowship in Mathematics at Virginia Tech.
6. Travel support for 42nd SIAM-SEAS Conference, UNC Chapel Hill, NC.
7. Travel support for Ninth Annual Graduate Student Mini-conference in Computational Mathematics, Columbia, SC, 2018, University of South Carolina.
8. Travel support for SIAM-CSE, Atlanta, GA, 2017, Clemson University.
9. Travel support for Joint Mathematics Meetings, Atlanta, GA, 2017, Clemson University.
10. AMS Sectional Meeting at North Carolina State University at Raleigh, Raleigh, NC, Travel Support Award, 2016.
11. SIAM Student Chapter Representative at AN16 Expenses Support, 2016.
12. Travel Award for SIAM-SEAS conference 2016. Department of Mathematical Sciences, Clemson University.
13. Travel Award for SIAM-SEAS conference 2015. Department of Mathematical Sciences, Clemson University.
14. Graduate Student Teaching Assistant ship Award, 2012-2017. Department of Mathematical Sciences, Clemson University.
15. Dhaka to USA, One way travel award, 2013. Ministry of Finance, People's Republic of Bangladesh.
16. A.F. Mujibur Rahman Foundation Gold Medal and Cash Award 2009. Department of Mathematics, University of Dhaka. Awarded to the student of the Department of Mathematics with best result in MS.

17. University Grants Commission Merit Scholarship, 2008. Ministry of Education, Bangladesh.
18. A.F. Mujibur Rahman Foundation Gold Medal and Cash Award 2008. Department of Mathematics, University of Dhaka. Awarded to the student of the Department of Mathematics with best result in BS.
19. Mitra Yushuf Trust Fund Scholarship, 2006, University of Dhaka. For achieving the highest grade (mark) in third year offered by the Department of Mathematics.
20. Hasina Shiddki Trust Fund Scholarship, 2005, University of Dhaka. For achieving the highest grade (mark) in second year offered by the Department of Mathematics.

Taught Courses with full responsibility

University of Alabama at Birmingham:

Graduate: MA 668-Numerical Analysis I (Fall, 2023)

Texas A&M International University:

Graduate: MATH 5305 Real Analysis I (Fall, 2021)

Undergraduate:

MATH 4350 Partial Differential Equations (Fall, 2020, 2022),
MATH 4330 Numerical Linear Algebra (Spring, 2021),
MATH 3365 Discrete Mathematics (Spring, 2021, 2022, 2023),
MATH 3360 Statistical Analysis (Fall, 2021, 2022),
MATH 2415 Calculus-III (Spring, 2022, 2023),
MATH 2412 Pre-Calculus (Spring, 2023),
MATH 2414 Calculus II (Fall, 2020),
MATH 1314 College Algebra (Summer I, 2022).

Virginia Tech (Undergraduate):

MATH 2114 Introduction to Linear Algebra (Spring, Fall, 2018),
MATH 2204 Introduction to Multivariable Calculus (Fall, 2017).

Clemson University (Undergraduate):

MATH 2060 Calculus of Several Variables (Spring, 2017),
MATH 1060 Calculus of One Variable I (Fall, 2016),
MATH 1080 Calculus of One Variable II (Spring, 2016),
MATH 1040 Pre-Calculus and Introductory Differential Calculus (Fall, 2015).

Bangladesh University of Engineering and Technology (Undergraduate):

MATH 193 Vector Calculus (Fall, 2011),
MATH 291 Introduction to Ordinary Differential Equations (Fall, 2011),
MATH 221 Laplace Transformation (Fall, 2011),
MATH 163 Calculus of One Variable I (Fall, 2010 and Spring, 2011).

Manarat International University (Undergraduate), Dhaka, Bangladesh:

MATH-102 Mathematics for Business (Fall, 2011).

United International University (Undergraduate), Dhaka, Bangladesh:

BMT 1103 Business Mathematics I (Spring, 2011).

Southeast University (Undergraduate), Dhaka, Bangladesh:

MATH 1011 College Algebra (Spring, Summer, and Fall 2009, Spring, and Summer 2010),
MATH 1023 Business Calculus (Spring, Summer, and Fall, 2009, Spring, and Summer 2010),
MATH 135 Introduction to Ordinary Differential Equations (Spring, 2010).

University of Information Technology and Sciences (Undergraduate), Dhaka, Bangladesh:

MAT 161 College Algebra (Fall, 2008),
MAT 163 Calculus of One Variable I (Fall, 2008),
MAT 165 Introduction to Ordinary Differential Equations (Fall, 2008),
MAT 265 Complex Variables (Fall, 2008).

Teaching Assistant at Clemson University

Co-taught: MATH 3110: Linear Algebra (Summer, 2016, 2017)

Graded: MATH 2080: Introduction to Ordinary Differential Equations (Summer, 2016)
MATH 3650: Numerical Methods for Engineers (Spring, Summer, 2015)
MATH 2060: Calculus of Several Variables (Summer, 2015)
MATH 8530: Matrix Analysis (Fall, 2012, 2014)
MATH 4340: Advanced Engineering Mathematics (Summer, 2014)
MATH 6530: Advanced Calculus (Summer, Fall, 2013)
MATH 4190: Discrete Mathematical Structures (Spring, 2013)
MATH 1070: Differential and Integral Calculus (Fall, 2012)
MATH 2080: Introduction to Ordinary Differential Equations (Spring, Summer, 2012)

Service and Volunteering

- **Journal Guest Editor:** *Mathematics*, Special Issue: Advances in Numerical Methods for Partial Differential Equation, Fall 2023.
- **Conference organizer:**
  1. AMS Fall Southeastern Sectional Meeting at Mobile, University of South Alabama, Mobile, AL (08/14/2023)
  2. Special Session AMS Spring Western Sectional Meeting, University of Denver, Denver, CO (5/14/2022)
- Undergraduate Poster Session Judge: Joint Mathematics Meetings, 2023, Boston, MA
- **Journal Referee:**
  1. SIAM Journal on Numerical Analysis (2)
  2. Journal of Discrete and Continuous Dynamical Systems, Series B (1)
  3. Numerical Methods for Partial Differential Equations Journal (2)
  4. Journal of Applied Mathematics and Computing (1)
  5. Journal of Applied Mathematics and Computation (1)
  6. Journal of Numerical Mathematics (1)
  7. Computational Methods in Applied Mathematics (1)
  8. Nonlinear Dynamics (1)
- Curriculum committee member, College of Arts and Science, TAMIU (Fall 2022-Summer 2023).
- M.S. thesis committee member of Mr. Madison R. Guerra, TAMIU.
- Discover TAMIU, Spring 2022.
- Graduate Open House, TAMIU (Fall 2020-).
- Conference Presentation Judge, TAMIU (Fall 2020-).
- Undergraduate BA Program assessment committee member, TAMIU (Fall 2020-).
- Comprehensive exams committee member, TAMIU (Fall 2020-).
- Instructor at Texas Educator Certification Examination Program (TExES) review session, TAMIU (Spring 2021-).
- Graduate Admission Committee member, TAMIU (Fall 2020-).

- Represented TAMIU at United High School 9th Grade, Laredo, TX on the career day (Fall 2022).
- Represented TAMIU at United South High School, Laredo, TX on the career day (Spring 2022).
- Writing recommendation letters for graduate and undergraduate students, TAMIU (Fall 2020-).
- Examiner, Clemson University Calculus Challenge for high school students, (2015-2017). https://goo.gl/V0NXyp
- President, 'Bangladesh Association Clemson' a graduate student organization, (Fall 2014 - Fall 2015).
- Undergraduate exam committee member, BUET (2010-2012).
- Member of the class schedule committee, UITS (Fall, 2008).

Conferences/Seminars Presentations

10-14-2023	**Talk**, AMS Fall Southeastern Sectional Meeting, University of South Alabama, Mobile, AL
09-29-2023	**Seminar Talk**, School of Mathematical and Statistical Sciences, UTRGV and TAMUCC (virtual).
02-24-2023	**Seminar Talk**, Department of Mathematical Sciences, Kean University, Union, NJ
02-17-2023	**Seminar Talk**, Department of Mathematics and Statistics, Mississippi State University, Mississippi State, MS
02-15-2023	**Colloquium Talk**, Division of Mathematics, Computing, and Statistics, Simmons University, Boston, MA 02115, (virtual).
02-10-2023	**Seminar Talk**, Department of Mathematics, Lamar University, Beaumont, TX
02-03-2023	**Colloquium Talk**, Department of Mathematics, University of Alabama at Birmingham, AL
01-26-2023	**Colloquium Talk**, Department of Mathematics, Embry-riddle Aeronautical University, Daytona Beach, FL
01-04-2023	**Invited Talk**, Joint Mathematics Meetings 2023, Boston, MA
11-05-2022	**Poster Presentation**, 5th Annual Meeting of the SIAM Texas-Louisiana Section, University of Houston, Houston, TX
11-03-2022	**Colloquium Talk**, College of Arts & Science, TAMIU, Laredo, TX
08-08-2022	**Attended**, Joint Statistical Meetings, Washington D.C.
05-14-2022	**Talk**, AMS Spring Western Sectional Meeting, University of Denver, Denver, CO
04-08-2022	**Talk**, Joint Mathematics Meetings 2022 (virtual)
03-14-2022	**Invited Talk**, Webinar Series on Mathematics Unites, Organized by e-Math Info Ltd, Bangladesh, Episode# 031, (virtual)
02-04-2022	**Colloquium Talk**, Department of Mathematics, Augusta University, Augusta, GA
12-13-2021	**Colloquium Talk**, Department of Applied Mathematics, Florida Polytechnic University, Lakeland, FL
12-09-2021	**Invited Talk**, Numerical Analysis Seminar, University of Florida, Gainesville, FL
10-28-2021	**Colloquium Talk**, Department of Mathematics and Statistics, Texas Tech University, TX
09-18-2021	**Talk**, 44^{th} SIAM Southeastern Atlantic Section Conference, Auburn University, Auburn, AL
09-30-2020	**Colloquium Talk**, *School of Mathematical Sciences, East China Normal University, Shanghai, China (virtual)
03-03-2020	**Colloquium Talk**, *Department of Mathematics and Physics, Texas A&M International University, Laredo, TX

Conferences/Seminars Presentations

12-10-2019	**Invited Talk**, *MFD seminar at the Courant Institute, NYU, NY
11-21-2019	**Colloquium Talk**, *Department of Mathematical Sciences, University of Arkansas, Fayetteville, AR
10-21-2019	**Poster Presentation**, *61st Annual Meeting of the APS Division of Plasma Physics (DPP), Ft. Lauderdale, FL
08-07-2019	**Talk**, PSFC SIE meeting, MIT, Cambridge, MA
02-25-2019	**Talk**, PSFC modeling group, MIT, Cambridge, MA
02-13-2019	**Invited Talk**, *Mathematics Department Seminar, Adelphi University, Garden City, NY
01-17-2019	**Talk**, *Joint Mathematics Meetings, Baltimore, MD
12-06-2018	**Invited Talk**, *Mathematics Department Seminar, Rowan University, Glassboro, NJ
12-03-2018	**Invited Talk**, *Plasma Science and Fusion Center Seminar, MIT, Cambridge, MA
11-29-2018	**Talk**, Fluids Seminar, Department of Mathematics, Virginia Tech, Blacksburg, VA
11-05-2018	**Talk**, Fall Fluid Mechanics Symposium 2018, Virginia Tech, Blacksburg, VA
10-06-2018	**Invited Talk**, *The 4th Annual Meeting of SIAM Central States Section, University of Oklahoma, Norman, OK
03-11-2018	**Invited Talk**, *42nd SIAM-SEAS, UNC Chapel Hill, North Carolina
03-10-2018	**Invited Talk**, *42nd SIAM-SEAS, UNC Chapel Hill, North Carolina
02-17-2018	**Contributing Talk**, *Ninth Annual Graduate Student Mini-conference in Computational Mathematics, University of South Carolina, SC
11-03-2017	**Colloquium Talk**, Department of Mathematics, Virginia Tech, Blacksburg, VA
03-01-2017	**Talk**, SIAM CSE 2017, Atlanta, GA
01-07-2017	**Talk**, *Joint Mathematics Meetings, Atlanta, GA
12-13-2016	**Invited Talk**, *P. J. Atzberger's Group, University of California, Santa Barbara, CA
11-13-2016	**Invited Talk**, *AMS Sectional Meeting Program, NC State University, Raleigh, NC
11-11-2016	**Talk**, Computational Math Seminar at Department of Mathematical Sciences, Clemson University, Clemson, SC
12-03-2016	**Talk**, *40th SIAM Southeastern Atlantic Section Conference (SIAM-SEAS), University of Georgia, Athens, GA
06-02-2016	**Talk**, 8th Annual JohnFest / SIAM Student Conference, Clemson University, Clemson, SC
09-02-2015	**Talk**, Mathematical Sciences Department, Clemson University, Clemson, SC
03-21-2015	**Talk**, *39th SIAM-SEAS, The University of Alabama, Birmingham, AL
03-24-2015	**Talk**, Computational Math Seminar, Department of Mathematical Sciences, Clemson University, Clemson, SC
11-20-2012	**Talk**, Computational Math Seminar, Department of Mathematical Sciences, Clemson University, Clemson, SC

(* = received travel support)

Workshop

1. SAS Visual Analytics training workshop 2017, SAS and Clemson University, Clemson, SC
2. NVIDIA GPU Programming and Deep Learning workshops 2017, NVIDIA and Clemson University
3. Big Data Analytics with Hadoop MapReduce and Python 2017, Clemson University, SC
4. Introduction to Hadoop MapReduce with Python, 2017, Clemson University, SC
5. Introduction to R for Data Science on Super Computer, 2017, Clemson University, SC
6. High Performance Computing with Spatial Data using R 2016, Clemson University, SC
7. *Mathematical Problems to Industry (MPI) 2016, Duke University, Durham, NC

8. *Graduate Student Mathematical Modeling Camp (GSMMC) 2016, Rensselaer Polytechnic Institute, Troy
9. COMSOL Multi-physics & Application Builder Workshop Clemson, 2015, Clemson University, SC
10. Intel Xeon Phi Training Workshop on Stampede supercomputer, 2014, Clemson University, SC
11. Teacher's Appreciation Workshop, 2011, Bangladesh University of Engineering and Technology, Dhaka

(* = received travel support)

Key topics on course works

Data Science	Python: NumPy, matplotlib, Jupyter nb, Scikit-learn, pandas, TensorFlow: Keras, Pytorch, seaborn, R, SAS, C++, Matlab, XML, HTML, JSON, πScope, Shell scripting (sed, awk), Deep Neural Network, Practical Machine Learning, Data Cleaning, Statistical Analysis, Cross Validation, Optimization, Multivariate Analysis, Sampling Methods, SVD, Support-vector-machine, Gradient descent optimization, Regression (Logistic/Linear/GLMs), Decision Trees, Random Forest.
Statistics	Basic Statistics, Probability, Data Analysis, Principle of Statistics, Mathematical Statistics, Machine Learning, Statistical Methods, SAS Lab, Categorical Data Analysis.
Operations Research	Mathematical Programming, Advanced Linear Programming, Network Flow Programming, Stochastic Processes.
Computational Mathematics	Introduction to Scientific Computing, Advanced Numerical Analysis, Data Structures, Finite Element Method, Numerical Methods for Fluids Flow, Fluid Dynamics, Numerical Methods for Differential Equations, Grad-div stabilization methods in computational fluid dynamics, Sparse Matrix Algorithms and Advanced Topics in FEM, Numerical Partial Differential Equations.
Applied Analysis	Linear Analysis, Dynamical Systems, Measure and Integration, Functional Analysis, Ordinary and Partial Differential Equations, Topology, Complex Analysis.
Algebra	Matrix Analysis, Theory of Graphs, Number Theory, Abstract Algebra, Linear Algebra, Discrete Mathematics.
Applied Mathematics and Others	Mathematical Hydrology, Aerodynamics, Mathematical Modeling in Biology, Fuzzy Mathematics, Astronomy, Hydrodynamics, Methods of Applied Mathematics, History of Mathematics, Tensor Analysis, Differential Geometry, Mechanics, Electricity and Magnetism, Mechanics and Waves, Analytic and Vector Geometry, Computer Fundamentals, Programming Methodology.

Projects

1. Modeling Filter Compression, Fluid Generation and Parallelizing the Potts Model, GORE, Mathematical Problems to Industry (MPI) 2016, Duke University, Durham, NC. Link: https://goo.gl/pdY32U
2. C++ parallel implementation of incompressible viscous time-dependent NSE simulation using projection method in Dealii, HPC class 2015, Clemson University. Link: https://tinyurl.com/2crrhpdk

3. Water Accumulation in Plant Cells During Fruit Growth, GSMMC 2016 at Rensselaer Polytechnic Institute, Troy, NY. Link: https://goo.gl/rdiQkG
4. Linear Solvers for Saddle Point Problems Arising in Navier-Stokes Simulations. MS project at Clemson University, 2015.
5. Efficiency of Different Algorithms over Sparse Matrices, Advanced Numerical Analysis class, Clemson University, 2012. Link: https://goo.gl/hSffwE
6. Word problem and Automatic groups, Data Structure class, Clemson University, 2012.
7. Perturbation Methods in Aero Fluid Dynamics. Honors Project, University of Dhaka, 2006.

Learned Programming Languages/Software Packages

Mathematics	Large scale implementation of deal.ii library using C++ with MPI, Petra-M, FreeFem++, Matlab, Mathematica, Maple, Sage, R, SAS, IPython Notebook, Lindo, LaTeX, VisIt, Paraview, TechPlot
General	C, C++ with Multithreading and MPI, Python, Fortran, GraphLab
Platforms	Mac, Linux/Unix (Simulation Experience on Palmetto, Engaging, Eni and Cori Super Computers), Ubuntu and Windows, shell scripting (sed, awk, etc).

Collaborators and Co-authors

Leo G. Rebholz (Clemson U.); Traian Iliescu (Virginia Tech); Syunichi Shiraiwa (Princeton University); John C. Wright (MIT); Brian Labombard (MIT); Michael Schneier (U. Pittsburgh); Timo Heister (Clemson U.); Catalin Trenchea (U. Pittsburgh); Maciej Balajewicz (U. Illinois Urbana-Champaign); Max Gunzburger (Florida State U.); Songul Kaya (Middle East Tech U.); Mine Akbas (Duzce U.); Nan Jiang (University of Florida); Birgul Koc (IFPEN); Changhong Mou (U. Wisconsin-Madison);

Professional Memberships

- AMS: American Mathematical Society
- SIAM: Society for Industrial and Applied Mathematics
- APS: American Physical Society
- BMS: Bangladesh Mathematical Society

References

1. Dr. Leo G. Rebholz, Professor and Thesis Advisor, Department of Mathematical and Statistical Sciences, Long Hall 208, Clemson University, Clemson, SC, 29634, Phone: 864-656-1840, Email: rebholz@clemson.edu.

2. Dr. Timo Heister, Associate Professor and Thesis Advisor, Department of Mathematical and Statistical Sciences, O-110 Martin Hall, Clemson University, Clemson, SC, 29634, Phone: 864-656-0411, Email: heister@clemson.edu.

3. Dr. Brian Labombard, Senior Research Scientist, MIT Plasma Science and Fusion Center, NW17-107, Cambridge, MA 02139, Phone: 617-253-7264, Email: brianl@mit.edu

4. Dr. Syuníchi Shiraiwa, Princeton Plasma Physics Laboratory, Princeton University, Princeton, New Jersey, Email: shiraiwa@psfc.mit.edu
5. Dr. Traian Iliescu, Professor, 428 McBryde Hall, Department of Mathematics, Virginia Tech, Blacksburg, VA 24061-0123, Phone: 540-231-5296, Email: iliescu@vt.edu. Confidential recommendation letter can be requested at Email: send.Iliescu.61EC6608FF@interfolio.com