

Professional Experience

July 2024–present **Southern Methodist University (SMU),**
Postdoctoral Researcher,
Mentor: Prof. Daniel Reynolds.

Education

2024 **The University of Alabama (UA),**
Mathematics, PhD,
Advisor: Prof. Shan Zhao.

2024 **The University of Alabama (UA),**
Mathematics, MA.

2016 **University of Ghana (UG),**
BA Mathematics with Economics.

Research Interests

Poisson-Boltzmann solvers, temporally adaptive multirate infinitesimal (MRI) methods, SUNDIALS/ARKODE development, Numerical PDEs, Scientific Computing

Research Experience

2024–present **DOE Funded Project.**
Developing advanced techniques for temporal adaptivity in both single-rate and multi-rate systems of differential equations, including implementation of strong-stability-preserving Runge–Kutta methods.

2021–2024 **NSF Supported Project, DMS-2110914, DMS-2306991.**
Developed a new boundary treatment for the nonlinear Poisson-Boltzmann Equation (PBE).
Investigated numerical and regularization methods for solving the PBE.
Modified the rMIB Poisson-Boltzmann solver to accurately compute the electrostatic free energy of the nonlinear PBE.

2015–2016 **Undergraduate Research Thesis, EIGENFACES.**
Carried out face recognition using eigenfaces.
Coded eigenvectors of images using Python.
Investigated how lighting conditions affect face recognition.

Fall 2014 **Undergraduate Research Project, KINETICS OF LEAD TRANSFER IN THE BODY.**
Investigated the transportation of lead in the human body using ordinary differential equations (ODEs) and Python programming

Publications & Software

- **S. Amihere**, Y. Ren, W. Geng, and S. Zhao, A new boundary condition for the nonlinear Poisson-Boltzmann equation in electrostatic analysis of proteins, *Journal of Computational Physics*, 528, 113844, (2025).
- Y. Ren, **S. Amihere**, W. Geng, and S. Zhao, Comparison of three matched interface and boundary (MIB) schemes for solving the nonlinear Poisson-Boltzmann equation, *Communications in Information and Systems*, 24, 231-251, (2024)
- A. Winiewicz, **S. Amihere**, and S. Zhao. Nonlinear electrostatic free energy of a kirkwood sphere, https://szhao.people.ua.edu/uploads/9/0/8/4/90844682/npb_kirkwood_energy.m (software) (2022)
- **S. Amihere**, W. Geng, and S. Zhao, Benchmarking electrostatic free energy of the nonlinear Poisson-Boltzmann model for the Kirkwood sphere, *Communications In Information and Systems*, 22(3), 305-315, (2022).

Skills

Programming Languages Fortran, MATLAB, High Performance Computing, Experience with Python, C.

Certificates Introduction to Programming with MATLAB (Coursera).
Programming for Everybody (Getting Started with Python) (Coursera).

Awards

Apr. 2024 Outstanding Teaching Award, *College of Arts and Sciences, University of Alabama*.
Apr. 2024 Outstanding Teaching Award, Department of Mathematics, *University of Alabama*.
Mar. 2024 American Mathematical Society (AMS) Travel Award, *Spring 2024 Southeastern Sectional Meeting*.
Jan. 2024 Joint Mathematics Meetings (JMM) 2024 Travel Award, *American Mathematical Society*.
Jan. 2024 Graduate Student Travel Award, *Graduate School, University of Alabama*.
Nov. 2023 Graduate Student Travel Award, *Department of Mathematics, University of Alabama*.
Summer 2023 Summer Research Fellowship, *Department of Mathematics, University of Alabama*.
Summer 2022 Summer Research Fellowship, *Department of Mathematics, University of Alabama*.
May 2022 ICCMAE 2022 Travel Award, *Mississippi State University*.
May 2022 Graduate Student Travel Award, *Graduate School, University of Alabama*.
Nov. 2016 Best Graduating Female Student in Mathematics, *University of Ghana*.

Talks & Presentations

Apr. 2025 Applied Math Seminar, *Department of Mathematics, University of Ghana*.
Apr. 2025 2025 Rising Stars in Computational and Data Sciences, *ODEN Institute, UT Austin, Texas*.
Mar. 2025 2025 SIAM Conference on Computational Science and Engineering (CSE25), *Fort Worth, Texas*.
Oct. 2024 Clements Scientific Computing Seminar Series, *Southern Methodist University*.
Mar. 2024 AMS 2024 Spring Southeastern Sectional Meeting, *Florida State University*.
Jan. 2024 Joint Mathematics Meetings (JMM) 2024, *Moscone Center, San Francisco, CA*.
Nov. 2023 The 6th SIAM Texas-Louisiana Sectional Meeting 2023, *University of Louisiana at Lafayette*.
Oct. 2023 Mathematics Graduate Student Seminar, *The University of Alabama*.
Sept. 2023 Graduate Students' Mathematical Fair 2023, *Ghana Numerical Analysis*.
Nov. 2022 34th Joint Applied Math Meeting, *University of Alabama in Huntsville*.
May 2022 The Second International Conference on Computational Methods and Applications in Engineering (ICCMAE), *Mississippi State University*.
April 2022 Online Seminar on Mathematical Molecular Bioscience and Biophysics (MMBB), *Michigan State University*.
Feb. 2022 Mathematics Graduate Student Seminar, *The University of Alabama*.

Teaching Experience

2018–2024 **The University of Alabama**, GRADUATE TEACHING ASSISTANT.
Tutor, Mathematics Technology and Learning Center (MTLC)
Instructor for Linear Algebra (Math 237)
Instructor for Calculus I (Math 125)
Instructor for Differential Equations (Math 238)
Instructor for Finite Mathematics with applications (Math 110)
Instructor for Business Calculus (Math 121)
Instructor for Precalculus and Trigonometry (Math 115)
2016–2017 **University of Ghana**, TEACHING ASSISTANT.
Organized tutorials to explain lecture notes to students
Assisted students in Computational Mathematics project
Invigilated and graded interim assessment tests

Industry Experience

- 2017–2018 **Deffor Ventures**, MATHEMATICS PROJECT ASSISTANT.
Created online Mathematics lessons and exercises
Reviewed online Mathematics questions and solutions
- Fall 2016 **Legacy Tutor**, MATHEMATICS TUTOR.
Prepared Mathematics lesson notes for online tuition
Provided online tuition for students in Mathematics
- 2012–2016 **Ange Dior**, ADMINISTRATIVE ASSISTANT.
Served as a front-desk receptionist
Assisted in planning and coordinating events

Mentorship

- Mar. 2025 – present **Applied and Computational Mathematics**, *Science Publishing Group*, Reviewer.
- Feb. 2025 **Dallas Regional Science and Engineering Fair Academy**, Judge.
Evaluated and provided feedback on middle school and high school research work
- April 2024 **Ohio Academy of Science State Science Day competition**, Judge.
Evaluated and provided feedback on pre-college research work
- March 2024 **Undergraduate Research and Creative Activity Conference**, *UA*, Judge.
Evaluated and provided feedback on undergraduate poster presentations
- Jan. 2024 **Joint Mathematics Meetings (JMM)**, Judge.
Evaluated and provided feedback on undergraduate poster presentations
- 2022–2023 **The University of Alabama**, *Department of Mathematics*.
Guided and mentored two master's students through the completion of their theses
Provided guidance on converting a FORTRAN package to a MATLAB package

Leadership

- March 2025 **Minisymposium on Mathematics in Structural Biology**, SIAM CSE 2025, *Co-Organizer*.
- 2022–2024 **Association of Women in Mathematics**, *UA STUDENT CHAPTER*, *Secretary*.
Assisted in planning and coordinating events
Emailed newsletters and other important information to members
- Sept. 2023 **Graduate Students' Mathematical Fair**, GHANA NUMERICAL ANALYSIS, *Co-Organiser*.
Planned, organised and moderated a virtual conference for STEM graduate students of African origin
- 2015–2018 **iVolunteer Network Ghana**, *Founding Member*.
Tutored junior high students in Mathematics
Received and documented monetary transactions

Community Services

- Feb. 2024 MathCounts, *Grader*.
- Jan. 2024 JMM 2024 Graduate School Fair, *Volunteer*.
- Aug. 2023 UA GTA Workshop Team, *Teaching Fellow*.
- Apr. 2023 Troy MathFest Graduate School Fair, *Volunteer*.
- Feb. 2023 MathCounts, *Grader*.
- Aug. 2022 UA GTA Workshop Team, *Teaching Fellow*.
- Feb. 2022 MathCounts, *Grader*.
- Jan. 2022 JMM 2022 Graduate School Fair (Virtual), *Volunteer*.
- 2021–2022 UA African Students Association, *Volunteer*.

Professional Associations

American Mathematical Society (AMS).

Mathematical Association of America (MAA) .

Association for Women in Mathematics (AWM).

Society of Industrial and Applied Mathematics (SIAM).