

Matt Dallas CV

Department of Mathematics
University of Dallas
Irving, Texas, 75062 USA

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faculty page

Education

Ph.D. in Mathematics 2024
Thesis: *Convergence of Newton-Anderson at singular points and applications to fluid problems*
Advisor: Sara Pollock
University of Florida, Gainesville, Florida

M.S. in Mathematics 2021
University of Florida, Gainesville, Florida

B.S. in Mathematics and Physics 2019
Georgia College and State University, Milledgeville, Georgia

Research Interests

Analysis and implementation of Nonlinear solvers, particularly Newton and Levenberg-Marquardt methods, acceleration and extrapolation methods and their applications to nonlinear partial differential equations, and fractional calculus.

Publications

M. Dallas, S. Pollock, L. G. Rebholz, Analysis of an Adaptive Safeguarded Newton-Anderson Algorithm of Depth One with Applications to Fluid Problems. *ACSE*, 2 (2024), pp. 246-270.

M. Dallas, S. Pollock, Newton-Anderson at Singular Points. *Int. J. Numer. Anal. Mod.*, 20 (2023), pp. 667-692.

Courses Taught - Lecturer

University of Dallas

- Calculus I, Differential Equations, Euclidean and Non-Euclidean Geometries (Inquiry based), and Numerical Analysis

University of Florida

- Trigonometry and Calculus I (flipped)
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Courses Taught - Teaching Assistant

University of Florida

- Precalculus, Trigonometry, Calculus I, and Numerical Analysis.
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Expository writing and conference proceedings

M. Dallas, Improving Newton's Method Near Singular Points with Anderson Acceleration, Research highlight on mathinstitutes.org

M. Dallas, Fractional Calculus and its Connection to the Tautochrone, *Proceedings of the National Conference on Undergraduate Research*, 2019.

Professional Experience

Postdoctoral Teaching Fellow of Mathematics, <i>University of Dallas</i>	2024-present
Research Assistant, <i>University of Florida</i>	2020-2024
– Projects: Application of Anderson Acceleration to Newton's Method	
Teaching Assistant, <i>University of Florida</i>	2019-2024
Supplemental Instruction Coach, <i>Georgia College and State University</i>	2018-2019
Supplemental Instruction Leader, <i>Georgia College and State University</i>	2017-2018
Peer Tutor, <i>Georgia College and State University</i>	2016-2019

Conference Talks

SIAM Central States Section Meeting <i>Kansas City, MO</i>	2024
SIAM Texas-Louisiana Section Meeting <i>Baylor University, Waco, TX</i>	2024
Spring 2024 Finite Element Circus <i>Brown University, Providence, RI</i>	2024
Southeastern-Atlantic Regional Conference on Differential Equations <i>Florida A & M University, Tallahassee, Florida</i>	2023
Florida-Georgia Applied Computational Math Student Workshop <i>Florida State, Tallahassee, Florida</i>	2023
SIAM Southeastern Atlantic Section Meeting <i>Virginia Tech, Blacksburg, Virginia</i>	2023
Copper Country Workshop on Applied Mathematics, Statistics, and Data Science <i>Michigan Tech, Houghton, Michigan</i>	2022
National Conference for Undergraduate Research <i>Kennesaw State, Atlanta, Georgia</i>	2019

Seminar Talks

An Adaptive Safeguarding Scheme for Newton-Anderson <i>University of North Texas</i>	(upcoming) 2025
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Newton's Method or: Solving Nonlinear Equations Fast <i>Simple Words</i>	2024
Singular Newton-Anderson and Bifurcation Phenomena <i>Graduate Mathematics Association Colloquium, University of Florida</i>	2023
The Newton-Anderson Algorithm at Singular Points <i>SIAM Gators Applied/Numerical Seminar, University of Florida</i>	2022
Newton's Method at Singular Points <i>SIAM Gators Applied/Numerical Seminar, University of Florida</i>	2021
Fractional Calculus: Motivation and Fundamentals <i>Graduate Mathematics Association Colloquium, University of Florida</i>	2019

Poster Presentations

Adaptive Safeguarded Newton-Anderson at Singular and Nonsingular Points <i>SIAM CSE, Forth Worth, TX</i>	(upcoming) 2025
Newton-Anderson at Singular Points <i>Acceleration and Extrapolation Methods Workshop, ICERM, Brown University, Providence, RI</i>	2023

Service

Volunteer Judge for SCUDEM IX	2024
Vice President of American Mathematical Society Graduate Student Chapter <i>University of Florida</i>	2023-2024
Mathematics Festival Volunteer <i>University of Florida</i>	2023-2024
President of SIAM Gators <i>University of Florida</i>	2022-2023
Vice President of SIAM Gators <i>University of Florida</i>	2021-2022
Graduate Student Mentor for First Year Mathematics Graduates Students <i>University of Florida</i>	2021-2024
Julia Robinson Mathematics Festival Volunteer <i>Harn Museum, Gainesville, Florida</i>	2019

Organization

Minisymposium	March 2023
– SIAM SEAS at Virginia Tech	

- Title: Advances in numerical partial differential equations solvers for nonlinear and complex multi-physics systems.

Simple Words Seminar, *University of Florida* 2023-2024

- Talks given by faculty members from a variety of specializations aimed a general mathematical audience.
- Primarily attended by first and second year graduate students.

ApplyIt, *University of Florida* 2023

- Biweekly coding sessions attended by graduate students.
- Examples of sessions: programming Turing machines, solving systems of differential equations, programming simple games, and general problem solving.

Math Slam, *University of Florida* 2023

- Competition where graduate students have ten minutes to present their research to a general mathematical audience.
- Attended by undergraduates and graduates. Two faculty members served as judges.

Applied Book Club, *University of Florida* 2022-2023

- Attended by graduate students biweekly to discuss applied mathematics literature, both classic and recent.

SIAM Gators Applied/Numerical Seminar, *University of Florida* 2022-2023

- Weekly seminar attended by faculty and graduate students with talks from internal and external speakers.

Awards and Honors

Neil White Excellence in Teaching Award 2024
University of Florida

Graduate Student Teaching Award 2024
University of Florida

SIAM Certificate for Outstanding Efforts and Accomplishments on Behalf of SIAM Gators 2023

First place: SIAM SEAS Student Presentation Awards 2023
Virginia Tech

Graduate Teaching Certificate of Excellence 2021
University of Florida