



Noah CORBETT

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SUMMARY

I am a fifth year doctoral candidate in the Department of Mathematics and Statistics at Florida Atlantic University studying computational dynamical systems, differential equations, and nonlinear analysis. In particular, I employ functional-analytic techniques and computer-assisted proofs to rigorously study chaotic systems of ordinary differential equations, state-dependent delay differential equations, and travelling wave solutions of partial differential equations. I am also creating novel software to automate the computation and validation of invariant manifolds in ODE systems, and am applying this in my thesis as a new approach to classify the stability of traveling waves. In general, I view the computer as an invaluable tool in mathematics research and I enjoy learning and developing computational techniques to study open problems in mathematics.

EDUCATION

DOCTOR OF PHILOSOPHY, Mathematics

Spring 2025 (Expected)

FLORIDA ATLANTIC UNIVERSITY

- Dissertation: *Existence and stability of nonlinear waves: a computer-assisted approach.*
- 3.98/4.00 GPA

MASTER OF SCIENCE, Mathematics

2020

FLORIDA ATLANTIC UNIVERSITY

- MS Presentation: *The Stable Manifold Theorem*
- 4.00/4.00 GPA

BACHELOR OF SCIENCE, Mathematics

2018

FLORIDA ATLANTIC UNIVERSITY

- Minor in Statistics
- 3.84/4.00 GPA

PROFESSIONAL EXPERIENCE

GRADUATE TEACHING ASSISTANT

2018-Current

FLORIDA ATLANTIC UNIVERSITY

- Duties include tutoring, grading, and teaching for undergraduate courses in mathematics and statistics.

GRADUATE RESEARCH ASSISTANT

2020-2021, 2022-2024

FLORIDA ATLANTIC UNIVERSITY

- Partially supported to perform data analysis on an NSF-funded project in collaboration with FAU's College of Education.

NSF MATHEMATICAL SCIENCES GRADUATE RESEARCH INTERN

2023

U.S. ARMY CORPS OF ENGINEERS' RESEARCH AND DEVELOPMENT CENTER

- Intensive summer-long applied mathematics research program, funded by the NSF and administered by the Oak Ridge Institute for Science and Education (ORISE). The appointment took place onsite in Vicksburg, Mississippi.
- Performed research concerning the development of cryptanalytic tools to make predictions in chaotic systems. This work culminated in a paper and has been submitted to *Physical Review E* (see Publications [1]).

TEACHING EXPERIENCE

AS COURSE INSTRUCTOR

- MAP 3305 Engineering Mathematics 1 (Fall 2024, Fall 2022, Spring 2022)
- MAS 2103 Matrix Theory (Spring 2024)
- MAC 2312 Calculus with Analytic Geometry 2 (Fall 2023, Spring 2023)
- MAC 1105 College Algebra (Fall 2021)
- STA 2023 Introductory Statistics (Spring 2020)
- MAC 2233B Methods of Calculus (Fall 2019)

AS TEACHING ASSISTANT/EMBEDDED TUTOR

- MAS 2103 Matrix Theory (Summer 2024)
- MAD 3400 Numerical Methods (Fall 2023)
- MAD 2104 Discrete Mathematics (Summer 2022)
- STA 3100 Computational Statistics (Spring 2021)

PUBLICATIONS

- [1] **"PERIODIC ORBITS FOR STATE-DEPENDENT DELAY DIFFERENTIAL EQUATIONS"** *Accepted September 2024*
WITH V. NAUDOT. *INTERNATIONAL JOURNAL OF BIFURCATION AND CHAOS.*
- [2] **"PREDICTING STATE SWITCHES IN CHAOTIC DYNAMICAL SYSTEMS"** *Submitted July 2024*
WITH K. PILKIEWICZ AND M. MAYO
- [3] **"EXISTENCE AND STABILITY OF TRAVELLING WAVES: A COMPUTER-ASSISTED APPROACH"** *In preparation*
WITH J. D. MIRELES-JAMES
- [4] **"PERIODIC ORBITS IN THE STATE-DEPENDENT VAN DER POL SYSTEM"** *In preparation*
WITH V. NAUDOT
- [5] **"RECRUITMENT AND RETENTION OF STEM TEACHERS IN HIGH NEED SCHOOLS: AN ALUMNI SURVEY ANALYSIS OF SELECTED NSF ROBERT NOYCE PROGRAMS"** *In preparation*
WITH D. KUMAR AND S. MOFFITT
- [6] **"A MIXED METHOD STUDY OF STEM TEACHER SUPPLY TO HIGH NEED SCHOOLS IN FLORIDA AND TEXAS"** *In preparation*
WITH D. KUMAR, S. MOFFITT, AND C. RESTREPO-WIDNEY

POSTERS, PRESENTATIONS, & LECTURES

PERIODIC ORBITS FOR STATE-DEPENDENT DELAY DIFFERENTIAL EQUATIONS

PAPER PRESENTED AT:

- 2024 Florida Women in Math Day, Florida Atlantic University, Boca Raton, FL. *April 21, 2024*
- *Special Session on Recent Developments in Nonlinear and Computational Dynamics*, Spring 2024 AMS Eastern Sectional Meeting, Howard University, Washington, D.C. *April 7, 2024*
- Graduate Student Seminar, Florida Atlantic University, Boca Raton, FL. *March 29, 2024*

PREDICTING STATE SWITCHES IN CHAOTIC DYNAMICAL SYSTEMS

PAPER PRESENTED AT:

- 13th Annual FAU Broward Research Symposium, Florida Atlantic University, Davie, FL. (Poster Session) *November 17, 2023*
- Graduate Student Seminar, Florida Atlantic University, Boca Raton, FL. *November 2, 2023*
- Analysis & Applications Seminar, Florida Atlantic University, Boca Raton, FL. *October 19, 2023*
- 2023 NSF MSGI Summer Research Symposium (*Virtual Event*) *August 22, 2023*
- Environmental Processes Branch Seminar, USACE ERDC, Vicksburg, MS. *August 10, 2023*

THE STABLE MANIFOLD THEOREM

- M.S. Presentation, Florida Atlantic University *April 17, 2020*

THE DYNAMICS OF CIRCLE MAPS AND DENJOY'S THEOREM

- Multi-class lecture for graduate course in Dynamical Systems at Florida Atlantic University *February 2020*

THE FOURIER TRANSFORM, REGULARITY, AND SOBOLEV EMBEDDING

- Lecture for graduate course in Partial Differential Equations at Florida Atlantic University *November 2019*

PROGRAMMING EXPERIENCE

LANGUAGES: MATLAB | R | Python | \LaTeX

RELEVANT SKILLS INTLAB | R Markdown | ggplots2 | AutoCAD | SageMath

FELLOWSHIPS & SCHOLARSHIPS

ISAAC SCHUR GRADUATE SCHOLARSHIP

2021

- Awarded to graduate students in mathematics who have successfully passed two qualifying exams, maintained a high GPA in graduate studies, and received distinguished letters of recommendation from two professors
- Award of \$1,000

FAU PRESIDENTIAL FELLOWSHIP

2018-2020

- Two-year fellowship awarded to doctoral students who have exhibited an excellent academic record and excellent letters of recommendation as determined by faculty at the time of admission
- Award of \$5,000 per year for the first two years of graduate studies

FLORIDA BRIGHT FUTURES SCHOLARSHIP

2018-2019

- Undergraduate scholarship awarded to Florida public university attendees with distinguished GPAs and SAT scores

ACTIVITIES & SERVICES

GRADUATE STUDENT SEMINAR, Organizer

2022-Current

- Organized and co-hosted weekly seminars, with presentations by graduate students and faculty within FAU's Department of Mathematical Sciences

AMS STUDENT CHAPTER

President

2023-Current

- Organized and lead chapter meetings, aided in organizing chapter events, and recruited officers and members for AMS student chapter.

Treasurer

2022-2023

- Managed funds and purchases for AMS-related events and activities at Florida Atlantic University.

FLORIDA ATLANTIC JAZZ ORCHESTRA, Lead Trombone

2016-2017, 2024

- Attended biweekly rehearsals and performed at various venues for concerts and events as the first-chair trombone player.

TECHNOLOGY FEE COMMITTEE, Graduate Student Representative

2021 - 2022

- Served on committee formed to review proposals and allocate funds for various technology-related enhancements across FAU.

CERTIFICATES & HONORS

- ACS Disaster Response Certificate (2024)
- CITI Responsible Conduct of Research Certificate (2023)
- CITI Social & Behavioral Research Investigators Certificate (2022)
- CRLA Level 3 Certified Tutor (2018)
- FAU Honors Program (2015-2018)