Erik Wendt

Curriculum vitae

University of Connecticut, Storrs
Department of Mathematics
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Education

2019–present **Ph.D. in Mathematics**, *University of Connecticut*, Storrs, CT
Advisors: Vasilis Chousionis and Dmitriy Leykekhman

2015–2019 **B.A. Mathematics (Honors)**, *Gettysburg College*, Gettysburg, PA

2017–2018 **Budapest Semesters in Mathematics**, *Budapest, Hungary*

Publications and Preprints

2022 **Rigorous Numerical Bounds on Hausdorff Dimension via Finite Elements**, in preparation
TBA

2019 **A state-dependent delay equation with chaotic solutions**, *B. Kennedy, Y. Mao, E. Wendt*, Electronic Journal of Qualitative Theory of Differential Equations, No. 22, 1–20; https://doi.org/10.14232/ejqtde.2019.1.22

Teaching Experience

2021-present **Instructor**, *University of Connecticut*, Storrs, CT
- **Fall 2021-Fall 2022**: Math 2705W (Technical Writing in Mathematics)
- **Spring 2021**: Math 1020 (Problem Solving)

2019-2020 **Teacher Assistant**, *University of Connecticut*, Storrs, CT
- **Spring 2020**: Math 1132 (Calculus II)
- **Fall 2019**: Math 1131 (Calculus I)

Presentations

Spring 2023 **Rigorous Numerical Bounds on Hausdorff Dimension via Finite Elements**, *Joint Mathematics Meetings*, Hyne's Convention Center, Boston, MA
In this talk, we establish rigorous numerical bounds on the Hausdorff dimension of limit sets using a finite element method approach. After a brief discussion about the surrounding theory, we introduce some recent computational methods used to establish these dimension estimates. Then, we show how finite elements may be used to obtain such bounds in more generality. Finally, we apply this method to fractal sets generated by higher dimensional continued fractions.

Spring 2022 **Computational Dimension Estimates in Conformal Dynamics and Applications**, *AMS New England Graduate Student Conference*, Brown University, Providence, RI

In this talk we show a method for obtaining rigorous computational Hausdorff dimension estimates, for certain types of fractals. By combining ideas from thermodynamic formalism and the finite element method, we highlight how techniques originating from applied mathematics may be used to obtain important theoretical results. Finally, we show some interesting applications of this work in the context of continued fractions.

Spring 2022 **An Introduction to the Quantum Fourier Transform**, *UConn SIAM Quantum Computing Workshop*, University of Connecticut, Storrs, CT

Starting with an introduction to some famous quantum algorithms, we talk about one of their unifying components: the Quantum Fourier Transform (QFT). Through an in-depth discussion of the QFT we highlight the high dimensionality of the phase space is one of the main advantages of quantum computing. Finally, we show some explicit applications of the QFT to the problems of phase estimation and factoring.

Fall 2021 **An Introduction to Rootfinding and Approximation Theory**, *Mathematics Continued Conference*, University of Connecticut, Storrs, CT

In this talk we give an introduction to Approximation Theory, with a focus on numerical methods used for finding the roots of functions. After reviewing both Lagrange and Chebyshev Interpolants, we explore both their theory and application in rootfinding for nonlinear problems. Finally, we provide some truly remarkable implementations of rootfinding in MATLAB applied to the gamma function as well as the Gauss map.

Spring 2021 **An Introduction to Ergodic Theory and Thermodynamic Formalism I/II**, *Mathematical Physics Learning Seminar*, University of Connecticut, Storrs, CT

In this talk we will look into some of the main theorems in ergodic theory and thermodynamic formalism, an offshoot of ergodic theory of contemporary interest. We cover the physical origins of ergodic theory and its role as a bridge between analysis and probability, and introduce some of its most surprising (and powerful) results. After this we dive into thermodynamic formalism, a branch of ergodic theory which has had many recent applications to various areas of mathematics including number theory, functional analysis, and geometry. We end with a discussion of the variational principle for Gurevich pressure, which gives a surprising relation between the entropy, pressure, and equilibrium measures for a topological Markov shift.

Outreach

2022-present **Applied Math Learning Seminar Organizer**, *University of Connecticut*, Storrs, CT

2022-present **Women in Mathematics and Applications Seminar Organizer**, *University of Connecticut*, Storrs, CT

2021-present **SIAM Graduate Student Reading Group Organizer**, *University of Connecticut*, Storrs, CT

Spring 2022 **Organizer of the SIAM Graduate Quantum Computing Workshop**, *University of Connecticut*, Storrs, CT

This workshop gave UConn graduate students an introduction to quantum computing, followed by a keynote lecture on current quantum computing research.

Fall 2021 **Speaker at the Mathematics Continued Conference**, *University of Connecticut*, Storrs, CT

The Mathematics Continued Conference provides undergraduates interested in mathematics with the opportunity to learn about graduate school and hear introductory talks about research in mathematics by both graduate students and faculty.

2021-2023 **President of the UConn Graduate Chapter of the Society of Industrial and Applied Mathematics**, *University of Connecticut*, Storrs, CT

2020-2021 **DRP Mentor**, *University of Connecticut*, Storrs, CT

Mentored an undergraduate for two semesters on fractals in analysis.