Trevor J. Richards Curriculum Vitae

Contact Information

Monmouth College
Mathematics, Statistics, and Comp. Science
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Education

Ph.D., Mathematics, University of Florida, 2013
- Dissertation Title: On the conformal equivalence of meromorphic functions.
- Advisor: Dr. Michael Jury

M.S., Mathematics, University of Florida, 2009

B.S., Mathematics, University of Florida, 2006
- Minor in Philosophy

Research Interests

Complex analysis and geometric function theory – especially the geometry of polynomials and rational functions.

Professional Experience

Monmouth College, Mathematics, Assistant Professor
2017 to present

Washington and Lee University, Mathematics, Visiting Assistant Professor
2014 to 2017

Virginia Tech University, Mathematics, Instructor
2013 to 2014

Publications

T. J. Richards. *Rouché's theorem and the geometry of rational functions.* Proc. Amer. Math. Soc. (To appear 2020).

T. J. Richards. *Some recent results on the geometry of complex polynomials: the Gauss–Lucas theorem, polynomial lemniscates, shape analysis, and conformal equivalence.* Complex Analysis and its Synergies (To appear 2020).

T. J. Richards, J. Yau. *Recognizing a difference quotient.* Pi Mu Epsilon Journal (To appear 2020).

T. J. Richards, M. Younsi. *Computing polynomial conformal models for low degree Blaschke products.* Comp. Methods Funct. Theory, 19: 173-182, 2019.

T. J. Richards, S. Steinerberger. *Leaky roots and stable Gauss–Lucas theorems.* Comp. Var. Ellip. Equations, 64(11): 1898-1904, 2019.

Publications (Continued)

T. J. Richards. *Characterizing meromorphic pseudo-lemniscates.* Comp. Methods Funct. Theory, 18(4): 609-616, 2018.

T. J. Richards, M. Younsi. *Conformal models and fingerprints of pseudo-lemniscates.* Constructive Approximation, 45(1): 129-141, 2017.

K. Beanland, P. D. Humke, T. J. Richards. *On Scottish Book problem 157.* Real Anal. Exchange, 41(2): 331-346, 2016.

T. J. Richards. *Conformal equivalence of analytic functions on compact sets.* Comp. Methods Funct. Theory, 16(4): 585-608, 2016.

T. J. Richards. *Level curve configurations and conformal equivalence of meromorphic functions.* Comp. Methods Funct. Theory, 15(2): 323-371, 2015.

Conference and Seminar Presentations

Joint Mathematics Meetings
Denver, Colorado
Rouché's theorem and the geometry of rational functions. (January 2020)

Summer Symposium in Real Analysis XLII
St. Petersburg, Russia
Luzin-type Properties and the Difference Quotient. (June 2018)

Canadian Mathematics Society Winter Meeting
Niagra Falls, Canada
On the conformal modeling problem. (December 2016)

South Eastern Analysis Meeting
Tampa, Florida
Conformal modeling by polynomials. (March 2016)

South Eastern Analysis Meeting
Athens, Georgia
Level curves and conformal equivalence of analytic and meromorphic functions. (March 2015)

University of Virginia Analysis Seminar
Charlottesville, Virginia
The conformal equivalence of polynomials and finite Blaschke products: A tale of three proofs. (November 2014)

South Eastern Analysis Meeting
Tuscaloosa, Alabama
Level curves and conformal equivalence of analytic and meromorphic functions. (March 2014)

Conference and Seminar Presentations (Continued)

Virginia Tech Dynamics and Complex Analysis Seminar
Blascksburg, Virginia
On the level curves of meromorphic functions. and others (August 2013)

University of Florida Mathematics Department Analysis Seminar
Gainesville, Florida
On meromorphic functions which share a level curve. and others (Fall 2009–Fall 2012)

Undergraduate Research Directed

Ashley Maurer, Shannon Wilbourne, *Supporting actuarial science at Monmouth College.*
Monmouth College, Summer 2018
Poster presented at Monmouth College August 2018 SOFIA Presentations

Molly Schoon, Nathan Smolcyzk, Allie Warfield, *Analyzing games of skill as games of chance.*
Monmouth College, Summer 2017
Poster presented at Monmouth College August 2017 SOFIA Presentations

Pengrui Wang, *Characterizing the direct products of directed semi-cycles.*
Washington and Lee University, Summer 2016
Poster presented at April 2017 MAA MD-DC-VA sectional meeting

Jimmy Yau, *Analytic and algebraic characterizations of the difference quotient of a real function.*
Washington and Lee University, Fall 2015
Resulting article to appear in Pi Mu Epsilon Magazine

Presentations to Undergraduates

MAA IL-IN-MI Trisectional Meeting
Valparaiso, Indiana
Graphs and the infinite train. (March 2018)

Washington and Lee University "Math, Munch, and Mingle" (Undergraduate Seminar)
Lexington, Virginia
Polynomials: Your real intuitions in a complex world. (February 2016)
An information theoretic proof of the infinitude of the prime numbers. (October 2015)

Washington and Lee University Analysis Seminar
Lexington, Virginia
On complex polynomials having prescribed critical values. (October 2014)

Presentations to Undergraduates (Continued)

MAA Maryland–District of Columbia–Virginia Section Meeting
Harrisonburg, Virginia
On the level curves of finite Blaschke products and polynomials. (April 2014)

Pi Mu Epsilon, University of Florida
Gainesville, Florida
Level curves of complex polynomials (rational functions can come too). (February 2011)
Finding the number of distinct zeros of a complex polynomial. (October 2009)

Workshops and Teaching Conferences

IBL SIGMAA Minicourse and Workshop: Introduction to Inquiry-Based Learning
Denver, Colorado
Joint Mathematics Meetings (Upcoming, January 2020)

Actuarial Teaching Conference
Columbus, Ohio
SOA Introduction and University Initiatives et. al. (June 2019)

Associated Colleges of the Midwest Institute on College Futures
Chicago, Illinois
Institute on Shared Governance. (July 2018)

Credentialing Exams Passed

Society of Actuaries Financial Mathematics (Exam FM August 2019)

Society of Actuaries Probability (Exam P July 2018)

Talks and Sessions Organized

AMS Special Session, Joint Mathematics Meetings
Denver, Colorado
The Geometry of Complex Polynomials and Rational Functions (Upcoming January 2020)

Monmouth College Public Lecture, Speaker: Paul Humke
Monmouth, Illinois
A Voyager from the Fourth Dimension, (October 2017)

Teaching Experience

Monmouth College
Elementary Functions, Calculus II, Linear Algebra, Differential Equations, Complex Analysis, Actuarial Exam P Prep, Discrete Mathematics, Real Analysis, Introduction to the Liberal Arts

Washington and Lee University
Calculus I, Calculus III, Linear Algebra, Finite Math II, Fundamental Concepts of Mathematics (Introduction to Proofs), Complex Analysis

Virginia Tech University
Calculus I, Calculus III, Differential Equations

University of Florida
Math for Liberal Arts Majors, Pre-Calculus, Trigonometry, Calculus I, Calculus II, Calculus III, Differential Equations

Institutional and Other Service

Spring 2020	Judge for Joint Mathematics Meetings Undergraduate poster session
Fall 2019 - present	Referee for *American Mathematical Monthly*
Fall 2019 - present	Served on Monmouth College Assessment Standing Committee
Summer 2018	Developed courses and four year plan for actuarial science study at Monmouth College (part of summer undergraduate research project)
Fall 2018	Referee for *Real Analysis Exchange*
Summer 2018	Directed Monmouth College SOfIA project on actuarial science
Spring 2018 - present	Faculty advisor for *Midwest Journal of Undergraduate Research*
Fall 2017 - present	Referee for *Midwest Journal of Undergraduate Research*
Fall 2017 - present	Assisted in administering Monmouth College Mathematics Capstone course
Summer 2017	Directed Monmouth College SOfIA project on discrete mathematics
Fall 2016	Referee for *Computational Methods and Function Theory*
Fall 2016	Administered WLU Problem of the Month
Summer 2016	Directed research project for Pengrui Wang (undergraduate)
Fall 2015	Directed research project for Jimmy Yau (undergraduate)
Fall 2014 - present	Reviewer for *AMS Mathematical Reviews*
Fall 2014	Co-taught the Putnam exam prep course for Washington and Lee Univ. Putnam exam team

Graduate Coursework

- Real Analysis
- Complex Analysis
- Logic
- Set Theory
- Algebra
- Topology
- Probability & Potential theory
- Functional Analysis
- Ergodic Theory & Dynamical Systems
- Differential Geometry
- Graph Theory

Relevant Software Skills

- Mathematica
- Matlab
- LaTeX
- Excel
- Sakai, Blackboard, Moodle