Thomas R. Cameron

Curriculum Vitae

Penn State Behrend
Department of Mathematics
trc5475@psu.edu

Education and Training

- Ph.D., Mathematics, *Washington State University*, Pullman, WA — May 2016
  Thesis: *On the computation of eigenvalues, spectral bounds, and Hessenberg form for matrix polynomials*
  Advisor: Michael J. Tsatsomeros

- M.S., Mathematics, *Washington State University*, Pullman, WA — November 2013
  Thesis: *Spectral bounds for matrix polynomials with unitary coefficients*
  Advisor: Michael J. Tsatsomeros

- B.S., Mathematics, *University of Minnesota Duluth*, Duluth, MN — May 2012
  Honors: Magna Cum Laude with Distinction

- A.A., General Liberal Arts, *Century College*, White Bear Lake, MN — May 2009

Appointments

- Assistant Professor, *Penn State Behrend*, Erie, PA — July 2020 – Current

- Visiting Assistant Professor, *Davidson College*, Davidson, NC — July 2017 – June 2020

- Visiting Assistant Professor, *College of Idaho*, Caldwell, ID — August 2016 – May 2017

- Teaching Assistant, *Washington State University*, Pullman, WA — January 2013 – May 2016

- Research Assistant, *Washington State University*, Pullman, WA — August 2012 – December 2012

Publications

Note: asterisk (*) indicates undergraduate student

- P. Becker, T. R. Cameron, D. Hanley, B. Ong, J. P. Previte, *Graphs Combin.*, 41(25), 2025

- T. R. Cameron and S. Graillat. Accurate Horner methods in real and complex floating-point arithmetic, *BIT*, 64(17), 2024

- W. Barrett, T. R. Cameron, E. Evans, H. Tracy Hall, M. Kempton. On the Laplacian spread of digraphs, *Linear Algebra Appl.*, 664: 126–146, 2023

- A. Abiad, B. Brimkov, J. Breen, T. R. Cameron, H. Gupta, R. R. Villagran. Constructions of cospectral graphs with different zero forcing numbers, *Electron. J. Linear Algebra*, 38: 280–294, 2022

- T. R. Cameron and S. Graillat. On a compensated Ehrlich-Aberth method for the accurate computation of all polynomial roots, *Electron. T. Numerical Analysis*, 55: 401–423, 2022

- T. R. Cameron, T. H. Hall, B. Small, and A. Wiedemann. On digraphs with polygonal restricted numerical range, *Linear Algebra Appl.*, 642: 285–310, 2022

- T. R. Cameron, S. Charmot*, and J. Pulaj. On the linear ordering problem and the rankability of data, *Foundations of Data Science*, 3(2): 133–149, 2021

- T. R. Cameron, M. Robertson*, and A. Wiedemann. On the restricted numerical range of the Laplacian matrix for digraphs, *Linear Multilinear Algebra*, 69(5): 840–854, 2021

- T. R. Cameron, A. N. Langville, H. C. Smith. On the graph Laplacian and the rankability of data, *Linear Algebra Appl.*, 588: 81–100, 2020

- T. R. Cameron and P. J. Psarrakos. On Householder sets for matrix polynomials, *Linear Algebra Appl.*, 585: 105–126, 2020

- T. R. Cameron and P. J. Psarrakos. On Descartes' rule of signs for matrix polynomials *Operators and Matrices*, 13 (3): 643–652, 2019

- T. R. Cameron and T. P. Chartier. Finite precision in an infinite world, *Math Horizons*, 27 (1): 12–14, 2019

- T. R. Cameron. The determinant from signed volume to the Laplace expansion, *Amer. Math. Monthly*, 126 (5): 437–447, 2019

- T. R. Cameron. An effective implementation of a modified Laguerre method for the roots of a polynomial, *Numer. Algorithms*, 82 (3): 1065-1084, 2019

- T. R. Cameron. On the reduction of matrix polynomials to Hessenberg form, *Electron. J. Linear Algebra*, 31: 321–334, 2016

- T. R. Cameron. Spectral bounds for matrix polynomials with unitary coefficients, *Electron. J. Linear Algebra*, 30: 585–591, 2015

Grants and Awards

- Penn State Behrend, School of Science Mentoring Award, 2022.
  Received award for my role in mentoring an honors undergraduate research project.

- University of Paris, Study Abroad, 2023.
  Received funding for travel, food, and housing.

- AMS MRC Program, Finding Needles in Haystacks: Approaches to inverse problems using combinatorics and linear algebra, 2021
  Received funding for travel, food, and housing.

- AMS-Simons Travel Grant Program, 7/1/2020 – 6/30/2022
  Received $5000 for research-related travel.

- MSRI Summer Graduate School, Spectral Geometry, University of Montreal, 2015
  Received funding for travel, food, and housing.

- Leon and Barbara Radziemski Graduate Fellowship, Washington State University, 2015
  Received funding for research expenses.

- Teaching Assistantship, Washington State University, 2013 – 2016
  Received stipend and tuition waiver.

- Research Assistantship, Washington State University, 2012
  Received stipend and tuition waiver.

- Sylvan D. Burgstahler Scholar, University of Minnesota Duluth, 2012

- Departmental Honor (Pi Mu Epsilon), University of Minnesota Duluth, 2012
- Outstanding Graduate (Honorable Mention), University of Minnesota Duluth, 2012
- Outstanding Math Student, Century College, 2011

Presentations

Note: asterisk (*) denotes an invited presentation.

- On the number of minimal forts of a graph*, Joint Mathematics Meeting, Seattle, WA, 2025
- On a accurate linear solver via compensated arithmetic*, *Slippery Rock University: Deparment of Mathematics Colloquium*, 2024
- On the number of minimal forts of a graph*, *Slippery Rock University: Department of Mathematics Colloquium*, 2024
- On open questions related to forts, (fractional) zero forcing, and the maximum nullity of a graph*, *Brigham Young University: Department of Mathematics Colloquium*, 2023
- On the Laplacian spread for digraphs, *Joint Mathematics Meeting*, Boston, MA, 2023
- Integer Programs for Zero-Forcing and Related Parameters*, *Joint Mathematics Meeting*, Boston, MA, 2023
- On a new notion of the Laplacian spread for digraphs, *Penn State Behrend: Math and Science Lunch Talk*, 2022
- On the restricted numerical range of a digraph and a new notion of the Laplacian spread*, *Brigham Young University: Department of Mathematics Colloquium*, 2022
- On digraphs with polygonal restricted numerical range,*Western Canada Linear Algebra Meeting*, Virtual, 2021
- On digraphs with polygonal restricted numerical range*,*Slippery Rock University: Department of Mathematics Colloquium*, Virtual, 2021
- On the rankability of data*, *Appalachian State University: Department of Mathematics Colloquium*, Boone, NC, 2020
- On the Graph Laplacian and the rankability of data, *Joint Mathematics Meeting*, Denver, CO, 2020
- On Householder sets for matrix polynomials, *Joint Mathematics Meeting*, Baltimore, MD, 2019
- On Descartes' Rule of Signs for matrix polynomials, *Joint Mathematics Meeting*, San Diego, CA, 2018
- On Descartes' Rule of Signs for matrix polynomials, *Davidson College: Coffee Talk*, Davidson, NC, 2017
- On Descartes' Rule of Signs for matrix polynomials*, *AMS Spring Western Sectional Meeting: Washington State University*, Pullman, WA, 2017
- Matrix Polynomials: A Natural Generalization of Spectral Theory, *College of Idaho: Department of Mathematics Colloquium*, Caldwell, ID, 2016

- Spectral bounds for unitary matrix polynomials, *Washington State University: Department of Mathematics Analysis Seminar*, Pullman, WA, 2016
- Constructive proof of Hessenberg form for matrix polynomials, *Washington State University: Department of Mathematics ClaN Seminar*, Pullman, WA, 2015
- Another approach to Jordan form, *Washington State University: Department of Mathematics CLaN Seminar*, Pullman, WA, 2015
- How do we really find eigenvalues?*, *University of Minnesota Duluth: Department of Mathematics Graduate Colloquium*, Duluth, MN, 2015
- Hyman's method for matrix polynomials, *Washington State University: Department of Mathematics CLaN Seminar*, Pullman, WA, 2014
- Factorization of matrix polynomials, *Washington State University: Department of Mathematics CLaN Seminar*, Pullman, WA, 2014
- The nonlinear eigenvalue problem*, *University of Minnesota Duluth: Department of Mathematics Graduate Colloquium*, Duluth, MN, 2014
- The Ehrlich-Aberth method for matrix polynomials, *Washington State University: Department of Mathematics CLaN Seminar*, Pullman, WA, 2013
- When does Newton's method fail?, *Washington State University: Department of Mathematics CLaN Seminar*, Pullman, WA, 2013
- The dynamics of Newton's method, *University of Minnesota Duluth: Department of Mathematics Undergraduate Colloquium*, Duluth, MN, 2012
- The capture and analysis of aerial photos of Lake Superior, *University of Minnesota Duluth: Department of Mathematics Undergraduate Colloquium*, Duluth, MN, 2012

Posters

- A Practical Parallelizable Fourth-Order Modification of Laguerre's Method, *MathFest*, Denver, CO, 2018
- A Practical Parallelizable Fourth-Order Modification of Laguerre's Method, *SIAM-SEAS*, Chapel Hill, NC, 2018
- On Modifications to Laguerre's Method and the Polynomial Eigenvalue Problem, *PNWAS*, Corvallis, OR, 2017
- Hessenberg form for matrix polynomials, *SIAM-ALA*, Atlanta, GA, 2015
- Eigenvalue computation for tridiagonal matrix polynomials, *PNWAS*, Portland, OR, 2014

Courses Taught

Penn State Behrend

Term	*Course Number*	*Course Name*
Fall 2024	Math 297	Special Topic: Integer and Combinatorial Optimization
Spring 2024	Math 140	Calculus with Analytic Geometry I
Spring 2024	Math 485	Graph Theory
Fall 2023	Math 251	Ordinary and Partial Differential Equations
Fall 2023	Math 312	Concepts of Real Analysis
Spring 2023	Math 110	Techniques of Calculus I
Spring 2023	Math 456	Numerical Analysis II
Fall 2022	Math 140	Calculus I
Fall 2022	Math 455	Numerical Analysis I
Spring 2022	Math 251	Ordinary and Partial Differential Equations
Spring 2022	Math 456	Numerical Analysis II
Fall 2021	Math 110	Techniques of Calculus I
Fall 2021	Math 210	Calculus with Engineering
Fall 2021	Math 455	Numerical Analysis I
Spring 2021	Math 456	Numerical Analysis II
Fall 2020	Math 110	Techniques of Calculus I
Fall 2020	Math 455	Numerical Analysis I

Davidson College

Term	*Course Number*	*Course Name*
Spring 2020	CSC 108	Exploring Computer Science
Spring 2020	MAT 220	Discrete Structures
Fall 2019	MAT 160	Calc III
Fall 2019	CSC 221	Data Structures
Spring 2019	MAT 331	Complex Analysis
Spring 2019	MAT 160	Calc III
Fall 2018	MAT 235	Differential Equations
Fall 2018	MAT 220	Discrete Structures
Spring 2018	MAT 112	Calc I and Modeling
Spring 2018	MAT 450	Advanced Linear Algebra
Fall 2017	MAT 150	Linear Algebra
Fall 2017	MAT 220	Discrete Structures

College of Idaho

Term	*Course Number*	*Course Name*
Spring 2017	CSC 150	Computer Science I
Spring 2017	MAT 252	Discrete Mathematics
Spring 2017	CSC 270	Applied Databases
Winter 2017	MAT 111	Contemporary Mathematics
Fall 2016	MAT 101	Survey of Algebra and Probability
Fall 2016	CSC 150	Computer Science I
Fall 2016	MAT 494	Independent Study: Differential Equations
Fall 2016	MAT 498	Upper Division Seminar

Washington State University

Term	*Course Number*	*Course Name*
Summer 2016	MAT 103	Algebra Methods
Spring 2016	MAT 220	Linear Algebra
Fall 2015	MAT 273	Calc 3
Spring 2015	MAT 105	Exploring Mathematics
Fall 2014	MAT 220	Linear Algebra
Summer 2014	MAT 220	Linear Algebra
Spring 2014	MAT 202	Business Calc II
Fall 2013	MAT 106	Pre Calc
Summer 2013	MAT 106	Pre Calc
Spring 2013	MAT 201	Business Calc I

Supervised Undergraduate Research

Penn State Behrend

- Kelvin Li, On the number of minimal forts of trees, 2024–2025
- Owen Grubbs, On the failed zero forcing number of trees, 2024–2025
- Owen Grubbs, On the forts of the hypercube graph, 2024
- Nathan Murarik, Compensated arithmetic for accurate linear solvers, 2023–2024
- Mason Willman, IP models for the zero forcing number, propagation time, and throttling number of a graph, 2022–2023
- Aymen Saidi, On a genetic algorithm for the zero forcing number and related graph parameters, 2021
- Jakob Loedding, The zero forcing diameter of a graph, 2021

Davidson College

- Michael Robertson, On the numerical range and algebraic connectivity of directed graphs, *Honors Thesis*, 2020
- Michael Robertson, Finding a needle in $\mathbb{C}$: On Initial Estimates for the Polynomial Eigenvalue Problem, *MathFest*, 2018
- Aidan O'Neill, On Error Free Transformations and Applications to Polynomial Equations, *MathFest*, 2018
- Hüseyin Altinisik, Max Li, Pasha Sonkin, and Jenny Zhong, Heterogeneous Computing and OpenCL, 2017

The College of Idaho

- Leo Trujillo, The numerical range of a matrix polynomial, *CofI Undergraduate Research Conference*, 2017
- Nick Steckley, On Modifications to Laguerre's Method and the Polynomial Eigenvalue Problem, *PNWNAS*, 2017
- Nick Steckley, On the application of Laguerre's method to the polynomial eigenvalue problem, *arXiv:1703.08767*, 2017
- Will Callahan, Sam Chandler, Johanna Mori, and Leo Trujillo, Using Chebyshev polynomials to solve ordinary differential equations, *Murdock Undergraduate Research Conference*, 2016

Washington State University

- Nick Steckley, A personalized grade management system using MySQL and PHP, 2016
- Grant Hutchings, Numerical algorithms for matrix computations and applications, 2016
- Michael Newsham, Bernstein polynomials and companion matrices, 2015

Professional Service

- Journal Referee:
  - Combinatorics
    - *Australasian Journal of Combinatorics*
    - *Electronic Journal of Combinatorics*
  - Computing Science
    - *IEEE Transactions on Knowledge and Data Engineering*
    - *Numerical Algorithms*
    - *Electronic Transactions of Numerical Analysis*
    - *Evolutionary Computation*
  - General mathematics
    - *Mathematics Magazine*
    - *American Mathematical Monthly*
  - Linear Algebra
    - *Electronic Journal of Linear Algebra*
    - *Linear Algebra and its Applications*
  - Network Science
    - *Proceedings of The Royal Society A*
- MathSciNet Reviewer
- Software Development: From 11/22/2018–7/31/2019, I helped the NAG (Numerical Algorithms Group) adopt my work on the numerical solution of polynomial equations. The routines developed appeared in Mark 27.1 of the NAG library.
- Textbook Reviewer:
  - J. Holt, *Linear Algebra with Applications*, Macmillan
  - M. T. Nair and A. Singh, *Linear Algebra*, Springer

Outreach and Institutional Service

Penn State Behrend

- Advising
  - Quantitative Module Advisor for ISB Program, 2022 – current
  - Schreyers Honors College Advisor, Kelvin Li, 2024 – current
  - Schreyers Honors College Advisor, Owen Grubbs, 2024 – current
  - Schreyers Honors College Advisor, Mason Willman, 2022 – 2023
  - Schreyers Honors College Advisor, Jakob Loedding, 2021 – 2022
- Committees
  - Director Search, 2025
  - Lecturer Search, 2023–2024
  - Faculty Senate Computing Committee, 2023
  - Tenure Track Search, 2022
  - Computer Science Option (Chair), 2021
  - Alumni Award, 2021
- Presentations
  - Robert Noyce Scholarship Program Presenter, 2023
  - Robert Noyce Scholarship Program Presenter, 2022
  - Math Freshman Seminar Presenter, 2020

Davidson College

- Davidson Math Problem Solving Group: Organized group meetings and handled registration and proctoring of math contests, Fall 2019
- Math Enrichment: Worked with high school student Joseph Campbell, Fall 2018 – Spring 2019
- Decision Davidson: Met with students and parents to discuss Davidson College, Spring 2018
- Putnam Math Contest: Proctored at Davidson College, Fall 2019
- Virginia Tech Regional Math Contest: Proctored at Davidson College, Fall 2017, 2018, 2019
- The Charlotte Mathematics Club: Assisted with activities and met with parents, Fall 2017 – Spring 2020

College of Idaho

- Physics Club: Faculty mentor for club, Fall 2016 – Spring 2017
- The Bird Stop: Advised student project to develop website for local business, Spring 2017
- Friday Night Office Hours: Extra office hours for students, Fall 2016 – Spring 2017

Washington State University

- Math Enrichment: Worked with high-achieving middle school student David Allen, Fall 2015 – Spring 2016
- Friday Night Office Hours: Extra office hours for students, Fall 2013 – Spring 2016

Computer Languages and Programs

- Advanced Knowledge: C, C++, Fortran, Gurobi, Java, LaTeX, Python
- Intermediate Knowledge: Mathematica, MATLAB, SML
- Basic Knowledge: Cobol, HTML, MySQL, PHP, R, SAS

Professional Associations

- American Mathematical Society (AMS)
- International Linear Algebra Society (ILAS)
- Mathematical Association of America (MAA)
- Society for Industrial and Applied Mathematics (SIAM)