

# THOMAS R. CAMERON

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## RESEARCH INTERESTS

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- ✧ linear algebra; matrix polynomials; nonnegative matrix theory; numerical analysis; rankability; spectral theory

## EDUCATION

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- ✧ **Ph.D.**, Mathematics, *Washington State University*, Pullman, WA May 2016  
Thesis: *On the computation of eigenvalues, spectral bounds, and Hessenberg form for matrix polynomials*  
Advisors: Michael J. Tsatsomeros, David S. Watkins, Judith J. McDonald
- ✧ **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

## PROFESSIONAL EXPERIENCE

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- ✧ **Visiting Assistant Professor**, *Davidson College*, Davidson, NC July 2017 – present
- ✧ **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

## HONORS AND AWARDS

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- ✧ **MSRI Summer Graduate School**, Spectral Geometry, University of Montreal, 2015  
Competitive nomination based selection process
- ✧ **Leon and Barbara Radziemski Graduate Fellowship**, Washington State University, 2015  
Rewards academic excellence and scholarship for graduate students
- ✧ **Teaching Assistantship**, Washington State University, 2013 – 2016
- ✧ **Research Assistantship**, Washington State University, 2012
- ✧ **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

## PUBLICATIONS

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Note: asterisk (\*) indicates undergraduate student

### *In Preparation*

5. T. R. Cameron and M. J. Tsatsomeros. Inhomogeneous Markov Chains
4. P. E. Anderson, T. R. Cameron, T. P. Chartier, and A. N. Langville. Rankability and the SVD
3. T. R. Cameron and A. O'Neill\*. Compensated Horner method and accurate root solvers
2. T. R. Cameron and M. Robertson\*. A modified Laguerre method for the polynomial eigenvalue problem
1. T. R. Cameron and P. J. Psarrakos. Householder sets for matrix polynomials

### *Submitted*

1. T. R. Cameron and P. J. Psarrakos, On Descartes' rule of signs for matrix polynomials

### *Accepted*

5. T. R. Cameron and T. P. Chartier. Finite precision in an infinite world, *Math Horizons*, Accepted on 7/9/2018
4. T. R. Cameron. The determinant from signed volume to the Laplace expansion, *Amer. Math. Monthly*, Accepted on 2/12/2018
3. T. R. Cameron. An effective implementation of a modified Laguerre method for the roots of a polynomial, *Numer. Algorithms*, <https://doi.org/10.1007/s11075-018-0641-9>
2. T. R. Cameron. On the reduction of matrix polynomials to Hessenberg form, *Electron. J. Linear Algebra*, 31: 321-334, 2016
1. T. R. Cameron. Spectral bounds for matrix polynomials with unitary coefficients, *Electron. J. Linear Algebra*, 30: 585-591, 2015

## PRESENTATIONS

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Note: asterisk (\*) denotes an invited presentation.

17. *On a modified Laguerre's method and the polynomial eigenvalue problem\**, Appalachian State University Department of Mathematics Colloquium, Boone, NC, 2018
16. *On Descartes' Rule of Signs for matrix polynomials*, Joint Mathematics Meeting, San Diego, CA, 2018
15. *On Descartes' Rule of Signs for matrix polynomials*, Davidson College Coffee Talk, Davidson, NC, 2017
14. *On Descartes' Rule of Signs for matrix polynomials\**, Washington State University AMS Spring Western Sectional Meeting, Pullman, WA, 2017
13. *Matrix Polynomials: A Natural Generalization of Spectral Theory*, College of Idaho Department of Mathematics Colloquium, Caldwell, ID, 2016
12. *The Personal Discovery Process: Numerical Differential Equations*, College of Idaho Faculty Forum, Caldwell, ID, 2016
11. *Spectral bounds for unitary matrix polynomials*, Washington State University Department of Mathematics Analysis Seminar, Pullman, WA, 2016

10. *Constructive proof of Hessenberg form for matrix polynomials*, Washington State University Department of Mathematics CLaN Seminar, Pullman, WA, 2015
9. *Another approach to Jordan form*, Washington State University Department of Mathematics CLaN Seminar, Pullman, WA, 2015
8. *How do we really find eigenvalues?*, University of Minnesota Duluth Department of Mathematics Graduate Colloquium, Duluth, MN, 2015
7. *Hyman's method for matrix polynomials*, Washington State University Department of Mathematics CLaN Seminar, Pullman, WA, 2014
6. *Factorization of matrix polynomials*, Washington State University Department of Mathematics CLaN Seminar, Pullman, WA, 2014
5. *The nonlinear eigenvalue problem*, University of Minnesota Duluth Department of Mathematics Graduate Colloquium, Duluth, MN, 2014
4. *The Ehrlich-Aberth method for matrix polynomials*, Washington State University Department of Mathematics CLaN Seminar, Pullman, WA, 2013
3. *When does Newton's method fail?*, Washington State University Department of Mathematics CLaN Seminar, Pullman, WA, 2013
2. *The dynamics of Newton's method*, University of Minnesota Duluth Department of Mathematics Undergraduate Colloquium, Duluth, MN, 2012
1. *The capture and analysis of aerial photos of Lake Superior*, University of Minnesota Duluth Department of Mathematics Undergraduate Colloquium, Duluth, MN, 2012

## POSTERS

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

## SUPERVISED UNDERGRADUATE RESEARCH

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Note: If applicable, conference or arXiv address is included, otherwise date of completion is given.

### Davidson College

3. Michael Robertson, *Finding a needle in  $\mathbb{C}$ : On Initial Estimates for the Polynomial Eigenvalue Problem*, MathFest, 2018
2. Aidan O'Neill, *On Error Free Transformations and Applications to Polynomial Equations*, MathFest, 2018
1. Hüseyin Altinisik, Max Li, Pasha Sonkin, and Jenny Zhong, *Heterogeneous Computing and OpenCL*, 2017

### *The College of Idaho*

2. Leo Trujillo, *The numerical range of a matrix polynomial*, CofI Undergraduate Research Conference, 2017
1. Will Callahan, Sam Chandler, Johanna Mori, and Leo Trujillo, *Using Chebyshev polynomials to solve ordinary differential equations*, Presented at Murdock Undergraduate Research Conference, 2016

### *Washington State University*

5. Nick Steckley, *On Modifications to Laguerre's Method and the Polynomial Eigenvalue Problem*, PNWNAS, 2017
4. Nick Steckley, *On the application of Laguerre's method to the polynomial eigenvalue problem*, [arXiv:1703.08767](https://arxiv.org/abs/1703.08767), 2017
3. Nick Steckley, *A personalized grade management system using MySQL and PHP*, 2016
2. Grant Hutchings, *Numerical algorithms for matrix computations and applications*, 2016
1. Michael Newsham, *Bernstein polynomials and companion matrices*, 2015

## PROFESSIONAL SERVICE

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### ✧ Journal referee by subject:

- Linear Algebra/Matrix Theory
  - *Electronic Journal of Linear Algebra*
  - *Linear Algebra and its Applications*
- General mathematics
  - *Mathematics Magazine*

### ✧ Textbook Reviewer

- J. Holt, *Linear Algebra with Applications*, Macmillan
- M. T. Nair and A. Singh, *Linear Algebra*, Springer

### ✧ Software Development

- Collaborator with the NAG, 11/22/2018 – 12/31/2019

## OUTREACH

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### *Davidson College*

- ✧ Math Enrichment: Worked with high-achieving high school student Joseph Campbell, Fall 2018
- ✧ Decision Davidson: Met with students and parents to discuss Davidson College, Spring 2018
- ✧ Virginia Tech Regional Math Contest: Proctored at Davidson College, Fall 2017 and Fall 2018
- ✧ The Charlotte Mathematics Club: Assisted in the supervision of activities, Fall 2017

### *College of Idaho*

- ✧ Physics Club: Faculty mentor for club, Fall 2016 – Spring 2017
- ✧ The Bird Stop: Developed website for a local business, Summer 2016
- ✧ 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

## CONFERENCES

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- ✧ MathFest, Denver, Co, August 2018  
Session: Introduction to Inquiry-Based Learning
- ✧ Western Canada Linear Algebra Meeting, Pullman, WA, May 2018
- ✧ SIAM-SEAS, Chapel Hill, NC, March, 2018
- ✧ Joint Mathematics Meetings, San Diego, CA, January 2017
- ✧ American Mathematical Society Spring Sectional Meeting, Pullman, WA, April 2017
- ✧ PNWNAS, Corvallis, OR, October 2017
- ✧ 25th Annual Murdock College Science Research Conference, Spokane, WA, November 2016
- ✧ SIAM-ALA, Atlanta, GA, October 2015
- ✧ PNWNAS, Portland, OR, October 2014

## COURSES TAUGHT

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### *Davidson College*

<i>Term</i>	<i>Course Number</i>	<i>Course Name</i>
Spring 2019	MAT 331	Complex Analysis
Spring 2019	MAT 160	Calc III
Fall 2018	MAT 235	Differential Equations
Fall 2018	CSC/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	CSC/MAT 220	Discrete Structures

College of Idaho

<i>Term</i>	<i>Course Number</i>	<i>Course Name</i>
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

<i>Term</i>	<i>Course Number</i>	<i>Course Name</i>
Summer 2016	MAT 103 (online)	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

## COMPUTER LANGUAGES AND PROGRAMS

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- ✧ Languages: C, C++, Fortran, HTML, Java Script, PHP, Python, and SML
- ✧ Applications: AWS, Excel,  $\LaTeX$ , MATLAB, Mathematica, MySQL, OpenCL, Pthread, Word
- ✧ Operating Systems: Linux (Ubuntu, CentOS, Gentoo), Mac OSX, Windows

## PROFESSIONAL ASSOCIATIONS

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

## REFERENCES

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Note: You will receive recommendation letters from some of the references listed below.

Michael J. Tsatsomeris  
Professor of Mathematics  
Washington State University  
tsat@math.wsu.edu

Judith J. McDonald  
Professor of Mathematics  
Washington State University  
jmcDonald@math.wsu.edu

David S. Watkins  
Professor Emeritus of Mathematics  
Washington State University  
watkins@math.wsu.edu

Panayiotis J. Psarrakos  
Professor of Mathematics and Dean  
National Technical University of Athens  
ppsarr@math.ntua.gr

Glen Granzow  
Assistant Professor of Computer Science  
College of Idaho  
ggranzow@collegeofidaho.edu

Timothy Chartier  
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Davidson College  
tichartier@ davidson.edu

Michael Mossinghoff  
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Davidson College  
mimossinghoff@davidson.edu