

KEIVAN HASSANI MONFARED – CV

CONTACT INFORMATION

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Department of Mathematics
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University of Calgary
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STATUS IN CANADA

Permanent Resident

RESEARCH INTERESTS

Linear Algebra: Combinatorial Matrix Theory
Discrete Mathematics: Algebraic Graph Theory
and their Applications in Neuroscience and Economics

EDUCATION

Ph.D., Mathematics August 2014
University of Wyoming, Laramie, WY, USA
Thesis: *The Jacobian Method: The art of finding more needles in nearby haystacks*
Advisor: Bryan L. Shader
Master of Science, Mathematics December 2011
University of Wyoming, Laramie, WY, USA
Thesis: *On the Permanent Rank of Matrices*
Advisor: Bryan L. Shader
Bachelor of Science, Mathematics and Computer Science July 2009
Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran
Thesis: *On the Existence of Nowhere-Zero Vectors for Linear Transformations*
Advisor: Dariush Kiani

PROFESSIONAL EXPERIENCE

PIMS Postdoctoral Fellow and Sessional Instructor 2017–Present
University of Calgary, Calgary, AB, Canada
Postdoctoral Fellow and Sessional Instructor 2015–2017
University of Calgary, Calgary, AB, Canada
Visiting Assistant Professor 2014–2015
Western Illinois University, Macomb, IL, USA
Graduate Teaching and Research Assistant 2009–2014
University of Wyoming, Laramie, WY, USA
Undergraduate Research Assistant 2008–2009
Institute for Research in Fundamental Sciences (IPM), Tehran, Iran

TEACHING EXPERIENCE

Teaching Certificates
• Instructional Skills Workshop Certificate August 2016
Taylor Institute for Teaching and Learning, University of Calgary
• Course Design Certificate October 2017
Taylor Institute for Teaching and Learning, University of Calgary
Graduate Courses
• **(Online Course)** Discrete Mathematics^{1,2,4} Summer 2012
for high school teachers
Undergraduate Courses
• Linear Algebra^{1–3} 2011, 2014, 2016, 2017, 2018
• Calculus I^{1–3} 2012, 2015, 2016, 2017

¹Designing the course theme, producing presentations for lectures, writing and delivering lectures, devising study guides, creating and maintaining a class web site, managing instructional resources. Writing and grading exams and assignments, holding regular office hours, mentoring and advising students.

²Handling all administrative aspects of the course.

³Creating the syllabus

• Discrete Mathematics ^{1,4}	2017
• General Statistics ^{1,2}	2015 2014
• Concepts of Mathematics ^{1,2}	2014
• Geometry and Measurement ^{1,2,4} for elementary school teachers	2014
• Calculus III ¹⁻³	2013
• Algebra and Trigonometry ^{1,2}	2011, 2013
• Calculus II ^{1,2}	2012
• Finite Mathematics ^{1,2}	2010, 2011
• Trigonometry ^{1,2}	2009, 2010
• College Algebra ^{1,2}	2010

PUBLICATIONS

Properties of a nonnegative reciprocal matrix and their application to AHP	2018+
Mojtabe Eslami and Keivan Hassani Monfared <i>In Progress.</i>	
Dissonance networks and social influence	2018+
Omid Atabati, Mojtaba Eslami, and Keivan Hassani Monfared <i>In Progress.</i>	
Community structure detection and evaluation during preictal and postictal hippocampal depth recordings	2018+
Keivan Hassani Monfared, Kris Vasudevan, Jordan. S. Farrell, and G. Cam Teskey <i>Under Review.</i>	
Inverse spectral problems for linked vibrating systems and structured matrix polynomials	2018+
Keivan Hassani Monfared and Peter Lancaster <i>Under review.</i>	
An analog of Matrix Tree Theorem for signless Laplacians	2018
Keivan Hassani Monfared and Sudipta Mallik <i>Linear Algebra and Its Applications.</i> 560 43–55	
A structured inverse spectrum problem for infinite graphs	2018
Keivan Hassani Monfared and Ehssan Khanmohammadi <i>Linear Algebra and Its Applications.</i> 539 28–43	
Existence of a not necessarily symmetric matrix with given distinct eigenvalues and graph	2017
Keivan Hassani Monfared <i>Linear Algebra and Its Applications.</i> 527 1–11	
The nowhere-zero eigenbasis problem for a graph	2016
Keivan Hassani Monfared and Bryan L. Shader <i>Linear Algebra and Its Applications.</i> 505 296–312	
On the principal permanent rank characteristic sequences of graphs and digraphs	2016
Keivan Hassani Monfared, Paul Horn, Franklin H. J. Kenter, Kathleen Nowak, John Sinkovic, and Josh Tobin <i>Electronic Journal of Linear Algebra.</i> 31 187–199	
Spectral characterization of matchings in graphs	2016
Keivan Hassani Monfared and Sudipta Mallik <i>Linear Algebra and Its Applications.</i> 496 407–419	
The λ-τ structured inverse eigenvalue problem	2015
Keivan Hassani Monfared and Bryan L. Shader <i>Linear and Multilinear Algebra.</i> 63 2275–2300	
Construction of real skew-symmetric matrices from interlaced spectral data, and graph	2015
Keivan Hassani Monfared and Sudipta Mallik <i>Linear Algebra and Its Applications.</i> 471 241–263	

⁴Mentoring teaching assistants. Leading a discussion session.

- Construction of matrices with a given graph and prescribed interlaced spectral data** 2013
 Keivan Hassani Monfared and Bryan L. Shader
Linear Algebra and Its Applications. 438 4348–4358
- On the existence of nowhere-zero vectors for linear transformations** 2010
 Saeed Akbari, Keivan Hassani Monfared, Mohammad Jamaali, Ehssan Khanmohammadi, and Dariush Kiani
Bulletin of the Australian Mathematical Society. 82 480–487

HONOURS AND AWARDS

Distinguished Awards

- PIMS postdoctoral fellowship Award** University of Calgary 2017
Pacific Institute for the Mathematical Sciences, Calgary, AB, Canada
- Teaching Award for Sessional Instructors (Nominated)**
 University of Calgary 2016
Outstanding contributions to student learning, Calgary, AB, Canada
- Graduate School Scholarship** University of Wyoming 2012–2014
Includes full tuition for doctorate program and stipend, Laramie, WY, USA
- Virinidra and Gail Sehgal Award** University of Wyoming Spring 2012
Excellence in Mathematics, Laramie, WY, USA
- Ms. Catherine A. Shaw Award** University of Wyoming Spring 2012
Excellence in Mathematics, Laramie, WY, USA
- Graduate School Scholarship** University of Wyoming 2009–2011
Includes full tuition for masters program and stipend, Laramie, WY, USA
- Bronze Medal** Iranian Mathematical Society May 2007
31st Nationwide Mathematics Competitions for University students, Mashhad, Iran

Travel Scholarships

- Fields Institute** October 2017
Fields Medal Symposium, Toronto, ON, Canada
- American Mathematical Society (AMS)** January 2015
Joint Mathematics Meeting, San Antonio, TX, USA
- Institute of Mathematics and its Applications (IMA)** September 2014
IMA Workshop: Probabilistic and Extremal Combinatorics, Minneapolis, MN, USA
- American Mathematical Society (AMS-MRC)** June 2014
Mathematics Research Communities, Algebraic and Geometric Methods in Applied Discrete Mathematics, Sundance, UT, USA
- Society of Industrial and Applied Mathematics (SIAM)** June 2014
Conference on Discrete Mathematics, Minneapolis, MN, USA
- NSF-CBMS Regional Research Conference** May 2014
Workshop on zeta functions on graphs, Snowbird, UT, USA
- University of Wyoming Graduate School** August 2013
MathFest 2013, Hartford, CT, USA
- University of Wyoming Mathematics Department** August 2013
MathFest 2013, Hartford, CT, USA
- University of Illinois at Urbana-Champaign** April 2012
Graduate Students Combinatorics Conference, Urbana, IL, USA
- Paul Stock Foundation** January 2012
Joint Mathematics Meeting 2012, Boston, MA, USA
- University of Wyoming Graduate School** January 2012
Joint Mathematics Meeting 2012, Boston, MA, USA
- University of Wyoming Mathematics Department** January 2012
Joint Mathematics Meeting 2012, Boston, MA, USA

SEMINARS AND TALKS

Invited Talks

Counting to infinity <i>High School Math Camp at University of Calgary, Calgary, AB, Canada</i>	July 2017
Counting from one <i>High School Math Camp at University of Calgary, Calgary, AB, Canada</i>	July 2017
Real life applications of calculus and linear algebra <i>Student Colloquium, University of Calgary, Calgary, AB, Canada</i>	November 2016
Using jacobian method to solve inverse eigenvalue problems for graphs <i>International Linear Algebra Society (ILAS 16), Leuven, Belgium</i>	July 2016
Touching infinity <i>Junior Math Contestants, University of Calgary, Calgary, AB, Canada</i>	June 2016
Permanent ranks of matrices and generalized cycles of graphs <i>47th Southeastern International Conference on Combinatorics, Graph Theory & Computing, Boca Raton, FL, USA</i>	March 2016
On the principal permanent rank characteristic sequences of graphs <i>Joint Mathematics Meeting 2016 (JMM 16), Seattle, WA, USA</i>	January 2016
Several examples on the jacobian method <i>Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM 15), Saskatoon, SK, Canada</i>	June 2015
The inverse principal perrank characteristic sequence problems <i>Rocky Mountain-Great Plains Graduate Research Workshop in Combinatorics (GRWC 15), Denver, CO, USA</i>	August 2014
Using the jacobian method in structured inverse eigenvalue problems <i>University of Colorado, Denver, CO, USA</i>	November 2013
On mathematics education <i>Parviz Shahriari Scientific and Cultural Foundation, Tehran, Iran</i>	June 2008

Contributed Talks

Graph partitioning problems arising in neuroscience <i>Prairie Discrete Mathematics Workshop(PDMW18), Brandon, MB, Canada</i>	July 2018
Some inverse eigenvalue problems for graphs <i>Western Canada Linear Algebra Meeting(WCLAM), University of Manitoba, Winnipeg, MB, Canada</i>	May 2016
Using the jacobian method to solve structured inverse eigenvalue problems <i>Joint Mathematics Meetings, Seattle, WA, USA</i>	January 2016
What do generalized cycles of a graph tell about each other? <i>Research Seminars, University of Calgary, Calgary, AB, Canada</i>	October 2015
How to find more solutions when you have one in hand <i>Research Seminars, University of Calgary, Calgary, AB, Canada</i>	September 2015
Nowhere-zero eigenbasis for a matrix with prescribed graph and spectrum <i>Joint Mathematics Meetings, San Antonio, TX, USA</i>	January 2015
Structured inverse eigenvalue problems <i>Colloquium, Western Illinois University, Macomb, IL, USA</i>	October 2014
Building vibrating systems using linear algebra and calculus <i>Student Colloquium, Western Illinois University, Macomb, IL, USA</i>	October 2014
Skew-symmetric SIEP and the role of the jacobian method <i>Algebra Combinatorics and Number Theory seminars, University of Wyoming, Laramie, WY, USA</i>	April 2014
The jacobian method and structured inverse eigenvalue problems <i>Joint Mathematics Meeting, Baltimore, MD, USA</i>	January 2014
On the importance of the jacobian method <i>Graduate Students Seminars, University of Wyoming, Laramie, WY, USA</i>	November 2013

Zonotopal algebra, an expository talk <i>Algebra Combinatorics and Number Theory seminars, University of Wyoming, Laramie, WY, USA</i>	October 2013
A structured inverse eigenvalue problem <i>MathFest, Hartford, CT, USA</i>	August 2013
The λ-μ structured inverse eigenvalue problem <i>Rocky Mountain Mathematics Consortium, University of Wyoming, Laramie, WY, USA</i>	July 2013
The λ-μ structured inverse eigenvalue problem <i>Rocky Mountain Discrete Math Days, University of Wyoming, Laramie, WY, USA</i>	July 2013
The λ-μ structured inverse eigenvalue problem <i>Rocky Mountain Discrete Math Days, Denver University, Denver, CO, USA</i>	October 2012
Constructing matrices with interlacing spectral data and graph <i>Midwestern Graph Theory (MIGHTY) LIH Conference, Iowa State University, Ames, IA, USA</i>	September 2012
A jacobian approach to some structured inverse eigenvalue problems <i>Algebra Combinatorics and Number Theory seminars, University of Wyoming, Laramie, WY, USA</i>	September 2012
Why is the permanent rank important? <i>Graduate Student Combinatorics Conference, University of Illinois, Urbana-Champaign, IL, USA</i>	April 2012
On the permanent rank of matrices <i>Joint Mathematics Meeting, Boston, MA, USA</i>	January 2012
Perrank v.s rank <i>Rocky Mountain Discrete Math Days, University of Wyoming, Laramie, WY, USA</i>	October 2011
What is the permanent? <i>Graduate Students Seminars, University of Wyoming, Laramie, WY, USA</i>	March 2011
A different approach to the hall's marriage theorem <i>Graduate Students Seminars, University of Wyoming, Laramie, WY, USA</i>	May 2010
A survey on the alon-jaeger-tarsi conjecture <i>Algebra Combinatorics and Number Theory seminars, University of Wyoming, Laramie, WY, USA</i>	November 2009
Biweekly math problem solving seminars <i>Undergraduate Students Seminars, Amirkabir Univeersity of Technology, Tehran, Iran</i>	2006–2007

Poster Presentations

Existence of a Nowhere-Zero Eigenbasis in an SIEP <i>IMA Workshop on Probabilistic and Extremal Combinatorics, Institute for Mathematics and its Applications, Minneapolis, MN, USA</i>	September 2014
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PROFESSIONAL AFFILIATIONS

Academy of Inquiry-Based Learning (AIBL)	2015–Present
Canadian Mathematical Society (CMS)	2015–Present
Mathematical Association of America (MAA)	2014–Present
American Mathematical Society (AMS)	2009–Present
Society for Industrial and Applied Mathematics (SIAM)	2009–Present
International Linear Algebra Society (ILAS)	2008–Present
Iranian Mathematical Society (IMS)	2007–2008

SERVICE

Invited Reviewer

<i>International Journal of Computer Mathematics</i>	2017–Present
<i>Mathematical Reviews</i>	2017–Present
<i>Linear Algebra and its Applications</i>	2016–Present
<i>Electronic Journal of Linear Algebra</i>	2014–Present
<i>Journal of Linear and Multilinear Algebra</i>	2012–Present

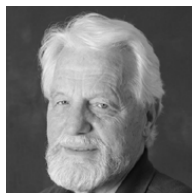
	Conference Co-organizer <ul style="list-style-type: none"> AMS Special Session on Graphs and Matrices - JMM17 <i>Atlanta, GA, USA - Co-organizers: Bryan Shader and Sudipta Mallik</i> 2017 Special Session on Emerging Topics in Graphs and Matrices - JMM18 <i>San Diego, CA, USA - Co-organizers: Bryan Shader and Sudipta Mallik</i> 2018
	Diversity & Equity Committee at University of Calgary <i>Faculty of Science Postdoctoral Representative</i> 2016–Present
	Safety Improvement Training Committee at University of Calgary <i>Faculty of Science Postdoctoral Representative</i> 2016–Present <i>Mathematics and Statistics Postdoctoral Representative</i> 2015–Present
	Junior Math Contest Committee <i>Contest designing team: University of Calgary, Canada</i> 2016–17 <i>Grading team: Western Illinois University, USA</i> 2015
	Mathematics Graduate Students Representative 2011–12 <i>University of Wyoming, USA</i>
	Iranian Students Representative 2010–11 <i>University of Wyoming, USA</i>
	Executive Member of the Management Council 2007–08 <i>Students Scientific Association of Mathematics and Computer Science, Amirkabir University of Technology, Iran</i>
GRANTS	PIMS Post-Doctoral fellowship grant 2016 <i>PIMS Alberta, University of Calgary, Canada</i> Funded
	Additional Collaboration Grant for Mathematics Research Communities 2014 <i>Algebraic and Geometric Methods in Applied Discrete Mathematics</i> Funded <i>American Mathematical Society, USA</i>
	Post-Doctoral fellowship grant 2014 <i>Fundação para a Ciência e a Tecnologia (FCT), Portugal</i> Not funded
COMPUTER SKILLS	Math: Sage , Octave / Matlab , MAGMA, CoCoA, Maple, Mathematica Programming: Python , and data analysis (SciKit-Learn, Pandas, etc.), Machine Learning <ul style="list-style-type: none"> Machine Learning certificate: Coursera, Stanford University Python for Data Science, Cognitive Class, an IBM initiative Online teaching and management: Microsoft Lync, Elluminate Blackboard, Desire2Learn (D2L), Webwork, Lyryx, ALEKS, MyLab Other: HTML; \LaTeX , Photoshop
SUMMER SCHOOLS AND WORKSHOPS	Course Design October 2017 <i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>
	The Slow Professor August 2017 <i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>
	Lesson Study May 2017 <i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>
	Beyond Student Feedback May 2017 <i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>
	Navigating Conflict in the Classroom March 2017 <i>Faculty of Science, University of Calgary, Canada</i>
	The Teaching Voice: Care and Confidence February 2017 <i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>
	Collecting and Responding to Mid-Course Student Feedback January 2017 <i>Faculty of Science, University of Calgary, Canada</i>

Flipped Learning Workshop	October 2016
<i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>	
Writing Good Questions Workshop	October 2016
<i>Faculty of Science, University of Calgary, Canada</i>	
Creating Your Teaching Dossier	September 2016
<i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>	
The Role of Design-Thinking and Innovation in Learning	September 2016
<i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>	
Creating Your Teaching Philosophy	September 2016
<i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>	
Instructional Skills Workshop	September 2016
<i>Taylor Institute for Teaching and Learning, University of Calgary, Canada</i>	
Making Sense of Student Feedback	May 2016
<i>Faculty of Science, University of Calgary, Canada</i>	
18th Annual Legacy of R. L. Moore, Inquiry-Based Learning Conference	June 2015
<i>Educational Advancement Foundation and Mathematical Association of America, Austin, USA</i>	
IMA Workshop: Probabilistic and Extremal Combinatorics	September 2014
<i>Institute for Mathematics and its Applications, Minnesota, USA</i>	
Rocky Mountain-Great Plains GRWC in Combinatorics	July 2014
<i>The University of Colorado Denver and The University of Denver, USA</i>	
Algebraic and Geometric Methods in Applied Discrete Mathematics	June 2014
<i>Mathematics Research Communities program, Snowbird, UT, USA</i>	
Mathematical Sciences on Combinatorial Zeta and L-functions	May 2014
<i>NSF-CBMS Regional Research Conference, Sundance, UT, USA</i>	
Algebraic Graph Theory	June 2013
<i>Rocky Mountain Mathematics Consortium, University of Wyoming, USA</i>	
Polyhedral Geometry and Algebraic Combinatorics	June 2011
<i>Rocky Mountain Mathematics Consortium, University of Wyoming, USA</i>	
2nd International Combinatorics Conference - IPM20	May 2009
<i>Institute for Research in Fundamental Sciences (IPM), Tehran, Iran</i>	
13th International CSI Computer Conference (CSICC 2008)	March 2008
<i>Sharif University, Iran</i>	
38th Annual International Iranian Mathematics Conference	Jun 2007
<i>Zanjan University, Iran</i>	

VOLUNTEERING

University of Calgary Open House	October 2016
<i>Postdoctoral Representative for Mathematics and Statistics Department</i>	
Banff International Film Festival	November 2015
<i>Green Team and Organizing Team</i>	

REFERENCES
AVAILABLE TO
CONTACT



Dr. Peter Lancaster

Professor Emeritus of Applied Mathematics
University of Calgary, Canada
Email: lancaste@ucalgary.ca
Phone: 403-220-6302
Relation: Postdoctoral Supervisor



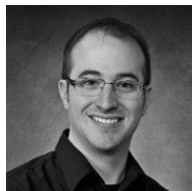
Dr. Bryan Shader

Professor of Mathematics
University of Wyoming, USA
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Phone: 307-766-6826
Relation: Ph.D. Advisor



Dr. Shaun Fallat

Professor of Mathematics and Department Head
University of Regina, Canada
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Relation: Colleague



Dr. Michael Cavers

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Relation: Postdoctoral Supervisor



Dr. Farhad Jafari

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Relation: Department Head, Non-thesis Advisor, Committee Member



Dr. Eric Moorhouse

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Relation: Committee Member



Dr. Jim Stallard

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Relation: Associate Head Teaching and Learning
(Concerning Teaching)



Dr. Charlie Angevine

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University of Wyoming, USA
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Phone: 307-766-4082
Relation: Course Supervisor
(Concerning Teaching)



Dr. Thi Dinh

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University of Calgary, Canada
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Relation: Course Coordinator, Assistant Head-Undergraduate
(Concerning Teaching)