Keivan Hassani Monfared – CV

Contact Information

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Department of Mathematics and Statistics
University of Calgary
2500 University Drive NW
Calgary AB T2N 1N4 Canada

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

[1] Designing 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.
[2] Handling all administrative aspects of the course.
[3] Creating 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] 2014
  for elementary school teachers
- 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
In Progress.

Dissonance networks and social influence 2018+
Omid Atabati, Mojtaba Eslami, and Keivan Hassani Monfared
In Progress.

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
Under Review.

Inverse spectral problems for linked vibrating systems and structured matrix polynomials 2018+
Keivan Hassani Monfared and Peter Lancaster
Under review.

An analog of Matrix Tree Theorem for signless Laplacians 2018
Keivan Hassani Monfared and Sudipta Mallik
Linear Algebra and Its Applications. 560 43–55

A structured inverse spectrum problem for infinite graphs 2018
Keivan Hassani Monfared and Ehssan Khanmohammadi
Linear Algebra and Its Applications. 539 28–43

Existence of a not necessarily symmetric matrix with given distinct eigenvalues and graph 2017
Keivan Hassani Monfared
Linear Algebra and Its Applications. 527 1–11

The nowhere-zero eigenbasis problem for a graph 2016
Keivan Hassani Monfared and Bryan L. Shader
Linear Algebra and Its Applications. 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
Electronic Journal of Linear Algebra. 31 187–199

Spectral characterization of matchings in graphs 2016
Keivan Hassani Monfared and Sudipta Mallik
Linear Algebra and Its Applications. 496 407–419

The λ-τ structured inverse eigenvalue problem 2015
Keivan Hassani Monfared and Bryan L. Shader
Linear and Multilinear Algebra. 63 2275–2300

Construction of real skew-symmetric matrices from interlaced spectral data, and graph 2015
Keivan Hassani Monfared and Sudipta Mallik
Linear Algebra and Its Applications. 471 241–263

[4]Mentoring 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 July 2017
High School Math Camp at University of Calgary, Calgary, AB, Canada

Counting from one July 2017
High School Math Camp at University of Calgary, Calgary, AB, Canada

Real life applications of calculus and linear algebra November 2016
Student Colloquium, University of Calgary, Calgary, AB, Canada

Using jacobian method to solve inverse eigenvalue problems for graphs July 2016
International Linear Algebra Society (ILAS 16), Leuven, Belgium

Touching infinity June 2016
Junior Math Contestants, University of Calgary, Calgary, AB, Canada

Permanent ranks of matrices and generalized cycles of graphs March 2016
47th Southeastern International Conference on Combinatorics, Graph Theory & Computing, Boca Raton, FL, USA

On the principal permanent rank characteristic sequences of graphs January 2016
Joint Mathematics Meeting 2016 (JMM 16), Seattle, WA, USA

Several examples on the jacobian method June 2015
Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM 15), Saskatoon, SK, Canada

The inverse principal perrank characteristic sequence problems August 2014
Rocky Mountain-Great Plains Graduate Research Workshop in Combinatorics (GRWC 15), Denver, CO, USA

Using the jacobian method in structured inverse eigenvalue problems November 2013
University of Colorado, Denver, CO, USA

On mathematics education June 2008
Parviz Shahriari Scientific and Cultural Foundation, Tehran, Iran

Contributed Talks

Graph partitioning problems arising in neuroscience July 2018
Prairie Discrete Mathematics Workshop(PDMW18), Brandon, MB, Canada

Some inverse eigenvalue problems for graphs May 2016
Western Canada Linear Algebra Meeting(WCLAM), University of Manitoba, Winnipeg, MB, Canada

Using the jacobian method to solve structured inverse eigenvalue problems January 2016
Joint Mathematics Meetings, Seattle, WA, USA

What do generalized cycles of a graph tell about each other? October 2015
Research Seminars, University of Calgary, Calgary, AB, Canada

How to find more solutions when you have one in hand September 2015
Research Seminars, University of Calgary, Calgary, AB, Canada

Nowhere-zero eigenbasis for a matrix with prescribed graph and spectrum January 2015
Joint Mathematics Meetings, San Antonio, TX, USA

Structured inverse eigenvalue problems October 2014
Colloquium, Western Illinois University, Macomb, IL, USA

Building vibrating systems using linear algebra and calculus October 2014
Student Colloquium, Western Illinois University, Macomb, IL, USA

Skew-symmetric SIEP and the role of the jacobian method April 2014
Algebra Combinatorics and Number Theory seminars, University of Wyoming, Laramie, WY, USA

The jacobian method and structured inverse eigenvalue problems January 2014
Joint Mathematics Meeting, Baltimore, MD, USA

On the importance of the jacobian method November 2013
Graduate Students Seminars, University of Wyoming, Laramie, WY, USA

Zonotopal algebra, an expository talk October 2013
Algebra Combinatorics and Number Theory seminars,
University of Wyoming, Laramie, WY, USA

A structured inverse eigenvalue problem August 2013
MathFest, Hartford, CT, USA

The λ-μ structured inverse eigenvalue problem July 2013
Rocky Mountain Mathematics Consortium, University of Wyoming, Laramie, WY, USA

The λ-μ structured inverse eigenvalue problem July 2013
Rocky Mountain Discrete Math Days, University of Wyoming, Laramie, WY, USA

The λ-μ structured inverse eigenvalue problem October 2012
Rocky Mountain Discrete Math Days, Denver University, Denver, CO, USA

Constructing matrices with interlacing spectral data and graph September 2012
Midwestern Graph Theory (MIGHTY) LIII Conference,
Iowa State University, Ames, IA, USA

A jacobian approach to some structured inverse eigenvalue problems September 2012
Algebra Combinatorics and Number Theory seminars,
University of Wyoming, Laramie, WY, USA

Why is the permanent rank important? April 2012
Graduate Student Combinatorics Conference,
University of Illinois, Urbana-Champaign, IL, USA

On the permanent rank of matrices January 2012
Joint Mathematics Meeting, Boston, MA, USA

Perrank v.s rank October 2011
Rocky Mountain Discrete Math Days, University of Wyoming, Laramie, WY, USA

What is the permanent? March 2011
Graduate Students Seminars, University of Wyoming, Laramie, WY, USA

A different approach to the hall's marriage theorem May 2010
Graduate Students Seminars, University of Wyoming, Laramie, WY, USA

A survey on the alon-jaeger-tarsi conjecture November 2009
Algebra Combinatorics and Number Theory seminars,
University of Wyoming, Laramie, WY, USA

Biweekly math problem solving seminars 2006–2007
Undergraduate Students Seminars, Amirkabir Univeersity of Technology, Tehran, Iran

Poster Presentations

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

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

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

Conference Co-organizer

- AMS Special Session on Graphs and Matrices - JMM17 — 2017
  Atlanta, GA, USA - Co-organizers: Bryan Shader and Sudipta Mallik
- Special Session on Emerging Topics in Graphs and Matrices - JMM18 — 2018
  San Diego, CA, USA - Co-organizers: Bryan Shader and Sudipta Mallik

Diversity & Equity Committee at University of Calgary
Faculty of Science Postdoctoral Representative — 2016–Present

Safety Improvement Training Committee at University of Calgary
Faculty of Science Postdoctoral Representative — 2016–Present
Mathematics and Statistics Postdoctoral Representative — 2015–Present

Junior Math Contest Committee
Contest designing team: University of Calgary, Canada — 2016–17
Grading team: Western Illinois University, USA — 2015

Mathematics Graduate Students Representative — 2011–12
University of Wyoming, USA

Iranian Students Representative — 2010–11
University of Wyoming, USA

Executive Member of the Management Council — 2007–08
Students Scientific Association of Mathematics and Computer Science, Amirkabir University of Technology, Iran

Grants

PIMS Post-Doctoral fellowship grant — 2016
PIMS Alberta, University of Calgary, Canada — Funded

Additional Collaboration Grant for **M**athematics **R**esearch **C**ommunities — 2014
Algebraic and Geometric Methods in Applied Discrete Mathematics — Funded
American Mathematical Society, USA

Post-Doctoral fellowship grant — 2014
Fundação para a Ciôncia e a Tecnologia (FCT), Portugal — Not funded

Computer Skills

Math: **Sage**, **Octave/Matlab**, MAGMA, CoCoA, Maple, Mathematica

Programming: **Python**, and data analysis (SciKit-Learn, Pandas, etc.), Machine Learning

- 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
Taylor Institute for Teaching and Learning, University of Calgary, Canada

The Slow Professor — August 2017
Taylor Institute for Teaching and Learning, University of Calgary, Canada

Lesson Study — May 2017
Taylor Institute for Teaching and Learning, University of Calgary, Canada

Beyond Student Feedback — May 2017
Taylor Institute for Teaching and Learning, University of Calgary, Canada

Navigating Conflict in the Classroom — March 2017
Faculty of Science, University of Calgary, Canada

The Teaching Voice: Care and Confidence — February 2017
Taylor Institute for Teaching and Learning, University of Calgary, Canada

Collecting and Responding to Mid-Course Student Feedback — January 2017
Faculty of Science, University of Calgary, Canada

Flipped Learning Workshop October 2016
Taylor Institute for Teaching and Learning, University of Calgary, Canada

Writing Good Questions Workshop October 2016
Faculty of Science, University of Calgary, Canada

Creating Your Teaching Dossier September 2016
Taylor Institute for Teaching and Learning, University of Calgary, Canada

The Role of Design-Thinking and Innovation in Learning September 2016
Taylor Institute for Teaching and Learning, University of Calgary, Canada

Creating Your Teaching Philosophy September 2016
Taylor Institute for Teaching and Learning, University of Calgary, Canada

Instructional Skills Workshop September 2016
Taylor Institute for Teaching and Learning, University of Calgary, Canada

Making Sense of Student Feedback May 2016
Faculty of Science, University of Calgary, Canada

18th Annual Legacy of R. L. Moore, Inquiry-Based Learning Conference June 2015
Educational Advancement Foundation and Mathematical Association of America, Austin, USA

IMA Workshop: Probabilistic and Extremal Combinatorics September 2014
Institute for Mathematics and its Applications, Minnesota, USA

Rocky Mountain-Great Plains GRWC in Combinatorics July 2014
The University of Colorado Denver and The University of Denver, USA

Algebraic and Geometric Methods in Applied Discrete Mathematics June 2014
Mathematics Research Communities program, Snowbird, UT, USA

Mathematical Sciences on Combinatorial Zeta and L-functions May 2014
NSF-CBMS Regional Research Conference, Sundance, UT, USA

Algebraic Graph Theory June 2013
Rocky Mountain Mathematics Consortium, University of Wyoming, USA

Polyhedral Geometry and Algebraic Combinatorics June 2011
Rocky Mountain Mathematics Consortium, University of Wyoming, USA

2nd International Combinatorics Conference - IPM20 May 2009
Institute for Research in Fundamental Sciences (IPM), Tehran, Iran

13th International CSI Computer Conference (CSICC 2008) March 2008
Sharif University, Iran

38th Annual International Iranian Mathematics Conference Jun 2007
Zanjan University, Iran

Volunteering

University of Calgary Open House October 2016
Postdoctoral Representative for Mathematics and Statistics Department

Banff International Film Festival November 2015
Green Team and Organizing Team

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
Email: bshader@uwyo.edu
Phone: 307-766-6826
Relation: Ph.D. Advisor

Dr. Shaun Fallat
Professor of Mathematics and Department Head
University of Regina, Canada
Email: Shaun.Fallat@uregina.ca
Phone: 306-585-4107
Relation: Colleague

Dr. Michael Cavers
Adjunct Professor
University of Calgary, Canada
Email: mcavers@ucalgary.ca
Phone: 403-220-6305
Relation: Postdoctoral Supervisor

Dr. Farhad Jafari
Professor of Mathematics and Department Head
University of Wyoming, USA
Email: fjafari@uwyo.edu
Phone: 307-766-2383
Relation: Department Head, Non-thesis Advisor, Committee Member

Dr. Eric Moorhouse
Professor of Mathematics
University of Wyoming, USA
Email: moorhous@uwyo.edu
Phone: 307-766-4394
Relation: Committee Member

Dr. Jim Stallard
Teaching Professor
University of Calgary, Canada
Email: jbstall@ucalgary.ca
Phone: 403-220-3953
Relation: Associate Head Teaching and Learning
(Concerning Teaching)

Dr. Charlie Angevine
Affiliated Faculty
University of Wyoming, USA
Email: angevine@uwyo.edu
Phone: 307-766-4082
Relation: Course Supervisor
(Concerning Teaching)

Dr. Thi Dinh
Senior Instructor
University of Calgary, Canada
Email: tndinh@ucalgary.ca
Phone: 403-220-2214
Relation: Course Coordinator, Assistant Head–Undergraduate
(Concerning Teaching)