

Department of Mathematics
 University of California, Davis
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Employment

Postdoctoral Researcher, **Aalto University**, Helsinki, Finland 1/2012-12/2013

Education

Ph.D. Mathematics, **University of California**, Davis, CA Fall 2011
Advisor: Eric Babson
Dissertation: Topological Methods in Matroid Theory

B.S. Mathematics, **Grand Valley State University**, Allendale, MI 2007
Graduated Magna Cum Laude

Participant, **Budapest Semesters in Mathematics**, Budapest, Hungary Fall 2006

Honors & Awards

UC Davis Mathematics Department Block Grant Fellowship 10/2011-12/2011

NSF VIGRE Summer Graduate Fellowship 2011

NSF VIGRE Graduate Fellowship 1/2011-6/2011

UC Davis Yueh-Jing Lin Scholarship in Mathematics 2010

UC Davis Mathematics Department Block Grant Fellowship 10/2008-12/2008

Allied Academies Distinguished Research Award 2008

USDE GAANN Graduate Fellowship 10/2007-9/2008

GVSU Glen A. Niemeyer Outstanding Undergraduate Student Award 2007
 - Conferred on the two outstanding members of each graduating class.

MAA Joint Math Meetings Undergraduate Poster Prize Winner 2007

GVSU Mathematics Department Scholarship 8/2005-5/2007

GVSU Award for Excellence 8/2003-5/2007

Research Interests

Algebraic and topological combinatorics, graph theory, matroid theory, discrete geometry, and discrete analytic function theory.

Publications & Preprints

Key Feature Identification and Surface Correspondence via Conformal Maps, (with N. Amenta, J. Hass, and P. Koehl), in preparation.

Topological representations of matroid maps, arXiv:1104.4152, submitted, 24pp.

An evolutionary method for the minimum toll booth problem: the methodology (with L. Bai and R. C. Harwood), *Academy of Information and Management Sciences Journal*, Vol. 11, No. 2, (2008), 33-51.

A genetic algorithm for the minimum toll booth problem (with L. Bai, R. C. Harwood, and C. Kollmann), *Annual Proceedings of Decision Science Institute* (2006), 30411-30416.

Seminar Talks*A Topological Approach to Whitney Numbers and Weak Maps of Matroids*

- Combinatorics Seminar at Caltech December 2011
- Combinatorics and Geometry Seminar at University of Washington November 2011

Topological Representations of Matroid Maps

- Discrete Geometry Seminar at FU-Berlin May 2011
- Combinatorics Seminar at KTH, Stockholm May 2011
- Combinatorics Seminar at UC Berkeley April 2011
- Combinatorics Seminar at Binghamton University April 2011
- Discrete Geometry and Combinatorics Seminar at Cornell University April 2011

Conference Presentations*On Whitney Numbers and Weak Maps of Matroids*

- AMS Southeastern Section Special Session on Algebraic and Geometric Aspects of Matroids at Wake Forest University September 2011

Topological Representations of Matroid Maps

- Graduate Student Combinatorics Conference at Penn State University April 2011
- Davis Mathematics Conference at UC Davis September 2010

Mathematical Graphics in Topological Combinatorics

- Mathematical Graphics Workshop at Simon Fraser University August 2008

Circle Packings and Penrose Tilings

- UC Davis SIAM Student Research Conference May 2008
- JMM Undergraduate Poster Session at New Orleans January 2007
- MAA Mathfest at Knoxville August 2006
- AMS Central Section Special Session on Undergraduate Research at Notre Dame University April 2006

A Genetic Algorithm for the Minimum Toll Booth Problem

- JMM Undergraduate Poster Session at San Antonio January 2006
- Michigan Undergraduate Mathematics Conference at University of Michigan, Flint October 2005

Expository Lectures*An Elementary Proof of the Kneser-Lovasz Theorem*

- University of Washington Student Combinatorics Seminar November 2011

Homotopy Colimits of Diagrams of Spaces with a View Towards Toric Varieties

- UC Davis Student-Run Algebraic Geometry Seminar November 2011

Applications of Matroid Theory to Differential Geometry

- UC Davis Student-Run Applied Math Seminar September 2011

Matroid Bundles I & II

- UC Berkeley Topological Combinatorics Seminar March 2011

An Introduction to Poset Topology

- UC Davis Student-Run Discrete Math Seminar October 2010

Generalized Moment-Angle Complexes

- UC Berkeley Topological Combinatorics Seminar September 2010

An Introduction to Homotopy Colimits

- UC Berkeley Topological Combinatorics Seminar September 2010

An Elementary Proof of the Kneser-Lovasz Theorem

- VERUM Seminar at Valparaiso University June 2010

On the Evasiveness Conjecture for Graphs

- UC Davis Student-Run Discrete Math Seminar February 2010

Shape Recognition via Discrete Analytic Function Theory

- UC Davis Student-Run Geometry/Topology Seminar November 2009

Graph Homomorphisms and a General Lower Bound for Chromatic Number

- UC Davis Student-Run Discrete Math Seminar October 2009

A Combinatorial Homotopy Theory

- UC Davis Student-Run Geometry/Topology Seminar June 2009

Applications of Topology to Combinatorics and Graph Theory

- UC Davis Student-Run Geometry/Topology Seminar December 2008

An Introduction to Circle Packing

- UC Davis Student-Run Applied Math Seminar May 2008

A Simple Proof of the Kneser-Lovasz Theorem

- UC Davis Student-Run Discrete Math Seminar April 2008

An Introduction to the Choice Number

- UC Davis Student-Run Discrete Math Seminar February 2008

Conferences, Workshops, & Research Programs Attended

Joint Math Meetings in Boston January 2012

Graduate Student Workshop on Commutative Algebra at MSRI June 2011

Joint Math Meetings in New Orleans January 2011

Bay Area Discrete Math Days 2007-2011

Combinatorics Day at UC Berkeley February 2010

Mathematical Graphics and Illustration Workshop at Simon Fraser University August 2008

Graduate Student Combinatorics Conference at UC Davis April 2008

Teaching Experience

Associate Instructor (Instructor of Record)	UC Davis
<i>Combinatorics</i>	Summer 2011
<i>Short Calculus III</i>	Fall 2010
<i>Short Calculus III</i>	Summer 2010
Lead Teaching Assistant	UC Davis
<i>Calculus II</i>	Fall 2009
Teaching Assistant	UC Davis
<i>Ideals, Varieties, and Algorithms</i>	Fall 2011
<i>Calculus III</i>	Spring 2010
<i>Calculus II</i>	Fall 2009
<i>Transition to Abstract Math</i>	Spring 2009
<i>Calculus II</i>	Spring 2009
<i>Transition to Abstract Math</i>	Winter 2009
<i>Calculus I</i>	Fall 2008

Mathematics Outreach

Director	UC Davis
<i>Northern California American Regions</i>	Winter & Spring 2011
<i>Mathematics League Team</i>	
Graduate Assistant	Valparaiso University
<i>Valparaiso Experience in Research by</i>	Summer 2010
<i>Undergraduates in Mathematics</i>	
Director	UC Davis
<i>UC Davis Math Circle</i>	Winter 2010
<i>Exploratory High School Program</i>	
Math Circle Instructor	UC Davis
<i>An Intro to Mathematical Graphics</i>	Winter 2009

Volunteering & Service

Organizer	
<i>Second Annual Davis Math Conference</i>	September 2011
<i>UC Davis Student-Run Discrete Math Seminar</i>	2008-2010
<i>UC Davis Prospective Mathematics Graduate Student Welcome</i>	2010
President	
<i>UC Davis Galois Group (Mathematics Graduate Student Group)</i>	2010-2011
Representative	
<i>UC Davis Mathematics Undergraduate Program Committee</i>	2009-2010
<i>UC Davis Graduate Student Association</i>	2008-2009
Volunteer	
<i>Bay Area Discrete Math Day at UC Davis</i>	2009
<i>Graduate Student Combinatorics Conference at UC Davis</i>	2008
<i>Northern California ARML Team</i>	2008
<i>Oakland/East Bay Math Circle</i>	2008

Computer Proficiency

Mathematics Software: CirclePack, LaTeX, Macaulay2, Maple, MeshLab, SAGE.

Programing Languages: Java, Postscript, Python.

References

Eric Babson (PhD Advisor)
babson@math.ucdavis.edu
University of California, Davis

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KTH Royal Institute of Technology, Stockholm, Sweden

Jesús De Loera
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University of California, Davis

Alexander Engström (Postdoc Advisor)
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Joel Hass
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