Sara Jamshidi Zelenberg

CONTACT INFORMATION	Rettaliata Engineering Building, rm 208 Department of Applied Mathematics Illinois Institute of Technology Chicago, IL 60616	*Cell Phone:* (858) 752-4308 *Email:* szelenberg@iit.edu *Website:* http://www.sjzelenberg.com

EDUCATION

Pennsylvania State University, University Park, PA

Ph.D., Mathematics, August 2017
- Advisor: Jason Morton, Ph.D
- Distributed computational systems

California State University, Los Angeles, Los Angeles, CA

M.S., Mathematics, 2011
- Advisor: Borislava Gutarts, Ph.D
- Thesis: The sub-supersolution method applied to a quasilinear, hyperbolic PDE with a Nemytskii operator

M.S., Economics, Global Poverty Option (now called Global Economics), 2011

University of California, San Diego, San Diego, CA

B.A., Applied Mathematics 2007
- Advisor: Ron Evans, Ph.D
- McNair Scholars Program Research Project: The sharpest estimate of the Kloosterman sum (in one dimension)

PUBLICATIONS

Roe J., deForest R.,Jamshidi S. (2018) *Mathematics for Sustainability.* Springer Nature.

Jamshidi, S. (2018) Distributed computational systems, PhD Thesis, Pennsylvania State University.

PAPERS IN PREPARATION

Neural networks for algebraists
(joint w/ J. De Loera, R. Krone, S. Petrovic, L. Silverstein, D. Stasi)

A multithreaded implementation of Buchberger's algorithm in Macaulay2
(joint w/ S. Petrovic)

Localized nonstandard probabilities inspired by representativeness heuristics.
(joint w/ S. Petrovic)

Using neural network results with classical machine learning techniques
(joint w/ M. Dixon, R. Ellis, S. Petrovic)

A probabilistic Gröbner bases algorithm using violator spaces and machine learning.
(joint w/ S. Petrovic)

Formal Teaching Experience	Visiting Assistant Professor	Fall 2019

Math 497 - Topology
Department of Applied Mathematics,
Illinois Institute of Technology

Math 131 - Mathematics for Sustainability
Department of Applied Mathematics,
Illinois Institute of Technology

Visiting Assistant Professor Spring 2019
Math 251 - Multivariate Calculus (2 sections)
Department of Applied Mathematics,
Illinois Institute of Technology

Visiting Assistant Professor Fall 2018
Math 569 - Statistical Learning
Department of Applied Mathematics,
Illinois Institute of Technology

Instructor Summer 2018
Math 197 - Mathematics
Eberly College of Science,
Penn State University
(Part of the Penn State Millennium Scholars program)

Graduate Teaching Associate Fall 2015
Math 497 - Introduction to Applied Algebraic Geometry
Department of Mathematics,
Penn State University
(Part of the Penn State MASS program)

Assistant Spring 2015
Math 33 - Mathematics for Sustainability (a new course)
with John Roe,
Department of Mathematics,
Penn State University

Graduate Teaching Associate Spring 2015
Math 111 - Techniques of Calculus, II
Department of Mathematics,
Penn State University

Graduate Teaching Associate Fall 2014
Math 41 - Trigonometry and Analytic Geometry
Department of Mathematics,
Penn State University

Graduate Teaching Assistant Summer & Fall 2013
Math 231 - Multivariate Calculus
Department of Mathematics,
Penn State University

Graduate Teaching Assistant Spring 2013
Math 251 - Ordinary and Partial Differential Equations
Department of Mathematics,
Penn State University

Instructor Spring 2011

Math 100 - Introduction to College Mathematics
Department of Mathematics,
Cal State Los Angeles

OTHER TEACHING EXPERIENCE	Course Designer and Instructor	Fall 2013 - 2016, 2017

Gradtuate Teaching Assistant Training Course
Department of Mathematics,
Penn State University
The course covered many of the major topics from How Learning Works as well as relevant topics typically found in an introduction to social psychology course.

Instructor   Summer 2013, 2014
Precalculus
Upward Bound summer program,
Penn State University
This is a program for high school students. In the second iteration of this course, we conducted an IRB-approved experiment on inquiry based learning.

SERVICE   Member of the Dean Selection Committee for the Eberly College of Science
Climate & Diversity Committee, Dept. of Mathematics   May 2013 – Present
- Graduate Student Representative for Departmental Committee
- Graduate Student Subcommittee for Climate & Diversity
  Committee for the Eberly College of Science (Spring 2014)

CERTIFICATES   **Essentials of Online Teaching**
A certificate program that trains participants in how best to design online course work through Penn State's World Campus.
Penn State Teaching Associate
A promotion given to students who complete a range of tasks and demonstrate competency in teaching mathematics.
The Course on College Teaching
A certificate of completion for those who learn the basic ideas of education at the college-level. The course is designed for all majors.
Teaching with Technology
A Penn State online course and project to demonstrate competency in using technology in the classroom.

AWARDS   **The Intelligence National Security Alliance**
- Sidney D. Drell Academic Award   February 2017
The Graduate School, Penn State University
- Harold F. Martin Outstanding Teaching Award   March 2015
- Nominee of the Alumni Dissertation Award (2015-16)
Department of Mathematics, Penn State University
- ZZRQ Award   April 2014
- Departmental Teaching Award   December 2013
Eberly College of Science, Penn State University

• Climate & Diversity Award		January 2014

Revelle College, University of California, San Diego

- Ernest C. Morgan Leadership Award   2004
- College Council Member of the Quarter   2004

SPECIAL
PROGRAMS

- Faculty Affiliate at the WISER Institute   Fall 2019
- Rock Ethics Institute Fellow   Spring 2014
- CSU Chancellor's Scholar   May 2011
- McNair Scholar   Fall, Spring & Summer 2006

RESEARCH
TALKS &
POSTER
PRESENTATIONS

1. "Neural Networks for Algebraists," Nonlinear Algebra and Statistics Seminar, IIT, Septmber 2019.

2. "Neural Networks for Algebraists," Summer School on Randomness and Learning in Non-Linear Algebra, MPI, July 2019.

3. (Poster) "Multithreaded Buchberger's Algorithm in M2," Amherst College, June 2019.

4. (Poster) "Cognition-Inspired Object Classification," Air Force Research Lab, ATR Center, August 2015.

5. "Cognition-Inspired Object Classification", Air Force Research Lab, Workshop in Uncertainty Models, July 2015.

6. (Poster) "Algebraic Geometry of Tree Tensor Networks," CERS, Penn State University, April 2015.

7. (Poster) "Understanding the Geometry of Quantum States using Phylogenetics," Graduate Exhibition, Penn State University, March 2015.

8. (Poster) "Algebraic Geometry of Tree Tensor Networks," FoCM, Montevideo, Uruguay, December 2014.

9. "Algebraic Geometry of Tree Tensor Networks," AMS Sectional Meeting, San Francisco State University, October 2014.

10. "Algebraic Geometry of Tree Tensor Networks" (broken up into two talks), Applied Algebra Seminar, October 2014.

11. "Tree Tensor Network States: From Phylogenetics to Tree Tensor Network States," Comprehensive Exam Talk, The Pennsylvania State University, May 2014.

12. "DMRG Adaptations for Tree Tensor Networks," Tensor Networks and Applications Seminar, The Pennsylvania State University, April 2014.

13. "Strongly Correlated Quantum Systems in the Form of Trees," Tensor Networks and Applications Seminar, The Pennsylvania State University, March 2014.

14. "Mathematics and Sustainability," The Rock Ethics Instutite, The Pennsylvania State University, March 2014.

15. "Phylogenetic Invariants for the General Markov Model," Tensor Networks and Applications Seminar, The Pennsylvania State University, February 2014

16. "Student-Focused Teaching," Teaching Seminar, The Pennsylvania State University, January 2014

17. "Boson and Fermion Correspondence and the Jacobi Triple Product," q-series and Partitions, The Pennsylvania State University, December 2013

18. "LOCC and SLOCC Equivalence For Quantum Entanglement," Tensor Networks and Applications Seminar, The Pennsylvania State University, November 2013

19. "An Introduction to Tensor Networks," Tensor Networks and Applications Seminar, The Pennsylvania State University, September 2013

EDUCATIONAL
TALKS

1. "A Rocky Road: How backpropagation uses gradient descent and some common pitfalls," Machine Learning Club, IIT, October 2019.

2. "The Virtues of Self-Doubt," AWM, IIT, October 2019.

3. "Mathematics for Sustainability," AMS Sectional Meeting, John Roe Memorial, June 2019.

4. "Mathematics for Sustainability: Redefining General Education Math," MAA Wisconsin Sectional Meeting, April 2018.

5. "Mathematics for Sustainability," Math Club, University of Illinois at Chicago, April 2019.

6. "Mathematics for Sustainability," Women in Math, IIT, April 2019.

7. "A Brief Introduction to Neural Networks," Computational Math & Statistics seminar, IIT, October 2018.

8. "The Basics of Category Theory," Applied Research Lab, Penn State, January 2016.

9. "Mathematics and Sustainability," Rock Ethics Institute's Faculty Workshop, Penn State, May 2014.

10. "Student-Focused Teaching," Penn State Math Department, Penn State, February 2014.

WORKSHOPS AND
SUMMER
SCHOOLS
ATTENDED

1. Randomness and Learning in Nonlinear Algebra, MPI, Leipzig Germany 2019

2. Symbolic and Numerical Methods for Tensors and Representation Theory, Simons Institute in Berkeley CA, 2014

3. Modern Applications of Representation Theory, IMA, hosted by University of Chicago, 2014

4. Cal Tech - Cal State LA Collaborative Exchange, Pasadena, CA 2011

5. Zeta Functions All the Way, Institute for Advanced Study, Princeton 2006

OTHER
RESEARCH
EXPERIENCE

Graduate Research Assistant　　　　　　　January 2016 to December 2017
Department of Cognnition, Perception, and Autonomy,
Applied Research Lab at Penn State University
Supervisor: John Sustersic, Ph.D

Graduate Research Assistant　　　　　　　June 2015 to August 2015
Air Force Research Lab,
DoD-funded Program
Supervisor: Jared Culbertson, Ph.D

Research Assistant　　　　　　　August 2010 to August 2011
Active Approach to Algebra,
NSF-funded Program
Supervisor: Borislava Gutarts, Ph.D