

Kisun Lee

University of California San Diego, Department of Mathematics, Stefen E. Warschawski Visiting Assistant Professor.

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Research Interest

Applied algebraic geometry, specifically numerical algebraic geometry, and convex geometry.

Employment

University of California San Diego, La Jolla, California

July 2020 - Present

Stefen E. Warschawski Visiting Assistant Professor.

Education

Georgia Institute of Technology, Atlanta, Georgia

Aug 2015 - May 2020

Ph.D, Mathematics

Advisor : Anton Leykin

Thesis : Finding and certifying numerical roots of systems of equations

Sogang University, Seoul, Korea

Mar 2009 - Feb 2015

B.S, Mathematics

Awards/Honors

Georgia Tech Outstanding TA.

Spring 2020

Georgia Tech Outstanding Student Teaching Evaluation.

Spring 2018

Sogang University Dean's List.

Fall 2012, Fall 2013

Korea Student Aid Foundation (KOSAF)

The Scholarship for Natural Sciences and Engineering Students.

2012 - 2013

Preprints/Publications

D. I. Bernstein, G. Blekherman, & K. Lee (2020). Typical ranks in symmetric matrix completion. *Journal of Pure and Applied Algebra*.

K. Lee (2019). Certifying approximate solutions to polynomial systems on Macaulay2. Extended Abstract presented in *the 44th ISSAC*.

M. Burr, K. Lee, & A. Leykin (2019). Effective certification of approximate solutions to systems of equations involving analytic functions. In *Proceedings of the 44th ISSAC*.

T. Duff, C. Hill, A. N. Jensen, K. Lee, A. Leykin, & J. Sommars (2018). Solving polynomial systems via homotopy continuation and monodromy. *IMA Journal of Numerical Analysis*.

W. Jung, J. L. Kim, Y. Kim, & K. Lee (2015). The dimension of magic squares over fields of characteristics two and three. *Linear Algebra and its Applications*.

Softwares

NumericalCertification.m2, a Macaulay2 package.

MonodromySolver.m2, (joint with T. Duff, C. Hill, A. N. Jensen, A. Leykin & J. Sommars), a Macaulay2 package.

Conference Talks and Posters

Presentation : “Polyhedral Homotopy Method for Nash Equilibrium Problem”, November 2021, UCSD Optimization and Data Science Seminar, La Jolla, California, US. (Virtual)

Presentation : “Polyhedral Homotopy Method for Nash Equilibrium Problem”, July 2021, SIAM Conference on Applied Algebraic Geometry, College Station, Texas, US. (Virtual)

Presentation : “Finding and certifying numerical roots of systems of equations”, February 2021, University of California San Diego Algebraic Geometry Seminar, La Jolla, California, US. (Virtual)

Presentation : “Typical ranks in real symmetric matrix completion.”, March 2020, AMS Sectional Meeting, Charlottesville, Virginia, US. (Cancelled)

Presentation : “Certifying Solutions to a Square Analytic System”, October 2019, Joint CUNY Graduate Center-Courant Seminar in Symbolic-Numeric Computing, New York, US.

Presentation : “Certifying Solutions to a Square Analytic System”, October 2019, Clemson University Algebra and Discrete Mathematics Seminar, Clemson, US.

Presentation : “Certifying Solutions to a Square Analytic System”, October 2019, Georgia Institute of Technology Algebra Seminar, Atlanta, US.

Presentation : “Certifying Approximate Solutions to Polynomial Systems on Macaulay2”, July 2019, 44th International Symposium on Symbolic and Algebraic Computation, Beijing, China.

Presentation : “Certifying Solutions to a Square System Involving Analytic Functions”, July 2019, 44th International Symposium on Symbolic and Algebraic Computation, Beijing, China.

Presentation : “Certifying Solutions to a Square System Involving Analytic Functions”, July 2019, SIAM Conference on Applied Algebraic Geometry, Bern, Switzerland.

Poster : “Typical Ranks of Semisimple Graphs”, July 2019, Summer School on Randomness and Learning in Non-Linear Algebra, Leipzig, Germany.

Poster : “Typical Ranks of Semisimple Graphs”, June 2019, Effective Methods in Algebraic Geometry, Madrid, Spain.

Poster : “Certification for Roots of Systems Involving Analytic Functions”, April 2019, Meetings on Applied Algebraic Geometry, Atlanta, US.

Poster : “Monodromy Solvers”, November 2018, Nonlinear Algebra in Applications, Providence, US.

Poster : “Monodromy Solvers”, September 2018, Core Computational Methods, Providence, US.

Poster : “Monodromy Solvers”, April 2018, Meeting on Applied Algebraic Geometry, Atlanta, US.

Poster : “Solving Polynomial System Using Package MonodromySolver”, August 2017, SIAM Conference on Applied Algebraic Geometry, Atlanta, US.

Presentation : “Solving Polynomial Systems via Homotopy Continuation and Monodromy” (joint with Timothy Duff), October 2016, AMS Sectional Meeting , Denver, US.

Teaching Experience ☒ Mentoring

Department of Mathematics, University of California San Diego

- Group Leader : Directed Reading - Real Polyhedral Homotopy, Summer 2021.
- Program Mentor : AWM Mentorship program, Spring 2021.
- Math 20D, Introduction to Differential Equations, Winter 2021, Fall 2021 (Lead Instructor).
- Math 20C, Calculus & Analytic Geometry For Science & Engineering, Fall 2021 (Lead Instructor).
- Math 10C, Calculus III, Winter 2021, Spring 2021 (Lead Instructor).
- Math 103A, Modern Algebra I, Fall 2020 (Lead Instructor).

School of Mathematics, Georgia Institute of Technology

- Math 1711, Finite Mathematics, Spring 2019, Fall 2019, Spring 2020 (Lead Instructor).
- Math 1552, Integral Calculus, Summer 2019 (Lead Instructor).
- Math 1555, Calculus for Life Sceience, Spring 2018 (Lead Instructor).
- Math 1551, Differential Calculus, Fall 2017, Summer 2018 (Lead Instructor).
- Math 2552, Differential Equation, Spring 2016, Fall 2016, Spring 2017, Summer 2017 (Teaching Assistant).
- Math 1553, Introduction of Linear Algebra, Fall 2015 (Lecture Assistant).

Department of Mathematics, Sogang University

- Undergraduate Student Tutor.

Skills

Programming : MATLAB, Macaulay2, Julia, Python (SageMath).

Foreign Languages : Native Korean, Fluent English.

Activities

Georgia Tech School of Mathematics Graduate Student Council.	<i>2019 - 2020</i>
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AMS Graduate Student Chapter (Treasury).	<i>2017 - 2018</i>
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SIAM Conference on Applied Algebraic Geometry 2017 (Volunteer).	<i>August 2017</i>
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Seoul International Congress of Mathematicians 2014 (Volunteer).	<i>August 2014</i>
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