

Alperen Ali Ergür

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Education

2016 PhD in Mathematics - *Texas A&M University, USA*
Advisors: Grigoris Paouris and J. Maurice Rojas

2011 MS in Mathematics- *Tobb University, Turkey*

2009 BS in Mathematics- *Bilkent University, Turkey*

Employment

Aug 2020-present University of Texas at San Antonio
Assistant Professor
Mathematics Department

Sep 2019-Aug 2020 Carnegie Mellon University, Theoretical Computer Science Group
Postdoctoral Fellow
Mentors: Venkatesan Guruswami and Pravesh Kothari

May 2017-Aug 2019 Technical University of Berlin, Algorithmic Algebra Group
Einstein Postdoctoral Fellow
Mentors: Peter Bürgisser and Felipe Cucker

Aug 2016-May 2017 North Carolina State University, Symbolic Computation Group
Postdoctoral Research Scholar
Mentor: Cynthia Vinzant

Sep 2011-Aug 2016 Texas A&M University, Functional Analysis and Algebraic Geometry Groups
Graduate Research/Teaching Assistant
Assistant Instructor at Research Experience for Undergraduates Program

Teaching Experience

1. University of Texas at San Antonio
Linear Algebra, Probability and Computing
2. Technische Universität Berlin
Seminar on Interior Point Methods in Convex Optimization (co-teaching with T. de Wolff)
Effective Algebraic Geometry Lectures (co-teaching with P. Bürgisser and J. Tonelli-Cueto)
3. NC State University
Instructor for the following courses:
Linear Algebra for Science Majors, Calculus for Engineers, Precalculus
4. Texas A&M University
Assistant Instructor at Research Experience for Undergraduates Program
Mentored eight undergraduate research projects in four summers: 2013-2016.
Recitation Leader for Graduate Algebra, Probability, Advanced Calculus, Calculus

Research Visits

- April 2019** Sorbonne University, Paris, Host: Elias Tsigaridas
Nov 2018 Goethe Universität Frankfurt Am Main, Host: Amin Coja-Oghlan
Oct 2018 University of Missouri, Columbia, Host: Petros Valettas
April 2017 University of Michigan, Ann Arbor, Host: Alexander Barvinok
Mar 2016 Middle East Technical University, Host: Özgür Kızısel
Oct 2015 Technische Universität München, Host: Peter Gritzmann
Sept 2015 University of Athens, Host: Apostolos Giannopoulos

Grants, Awards, etc

- Jan 2017** Postdoctoral Fellowship by Einstein Foundation
Jun 2015 Travel Grants by University of Trento and Institut Henri Poincare
April 2014 AMS Travel Grant for Graduate Students
Sept 2009 Full Scholarship by Tobb University including tuition and stipend
Sept 2004 Full Scholarship by Bilkent University including tuition and stipend
< 2004 Two Bronze, One Silver Medal in National Math Contest

Research Interest

Discrete and Convex Geometry, Real Algebraic Geometry, Optimization,
Randomized Numerical Analysis, Theory of Computation

Publications and Preprints

Articles listed below are available at https://arxiv.org/a/ergur_a_1.html

1. Multihomogenous Nonnegative Polynomials and Sums of Squares
Discrete and Computational Geometry, 2018
<https://doi.org/10.1007/s00454-018-0011-3>
2. Probabilistic Condition Number Estimates for Real Polynomials I
(with G. Paouris and J.M. Rojas)
Foundations of Computational Mathematics, 2018
<https://doi.org/10.1007/s10208-018-9380-5>
3. Approximating Nonnegative Polynomials via Spectral Sparsification
SIAM Journal on Optimization, 2019
<https://doi.org/10.1137/17M1121743>
4. Tropical Varieties for Exponential Sums (with G. Paouris and J.M. Rojas)
Mathematische Annalen, 2019
<https://doi.org/10.1007/s00208-019-01808-5>
5. On the Expected Number of Zeros of Random Fewnomials
(with P. Bürgisser and J. Tonelli-Cueto)
SIAM Journal on Applied Algebra and Geometry (SIAGA), 2019
<https://doi.org/10.1137/18M1228682>
6. Probabilistic Condition Number Estimates for Real Polynomials II:
Structure and Smoothed Analysis (with G. Paouris and J.M. Rojas)
Minor Revision, Mathematics of Computation
7. Plantinga-Vegter Algorithm Takes Average Polynomial Time
(with F. Cucker and J. Tonelli-Cueto)
ACM Symposium on Symbolic and Algebraic Computation (ISSAC), 2019
<https://doi.org/10.1145/3326229.3326252>
Journal version submission @ Discrete & Computational Geometry
8. The Rank of Sparse Random Matrices
(with A. Coja-Oghlan, Pu Gao, S. Hettereich, H. Rolvien)
ACM Symposium on Discrete Algorithms (SODA), 2020
<https://doi.org/10.1137/1.9781611975994.35>
Submitted to Random Structures and Algorithms
9. A Polyhedral Homotopy Algorithm for Real Zeros
(with T. de Wolff)
Submitted to Advances in Geometry
10. The Multivariate Schwartz-Zippel Lemma
(with L. Dogan, J. Mundo, E. Tsigaridas)
Minor Revision, SIAM Journal of Discrete Mathematics
11. Functional Norms, Condition Numbers, and Numerical Algorithms in Algebraic Geometry
(with F. Cucker, J. Tonelli-Cueto)
Submitted to Forum Mathematics Sigma

Some Talks

Sept 2020 Data Seminar, U Missouri Columbia

Mar 2020 ACO Seminar, Carnegie Mellon University

Jul 2019 SIAM Conference on Applied Algebraic Geometry 2019, Bern
Jun 2019 Effective Methods in Algebraic Geometry (MEGA) 2019, Madrid
Apr 2019 Computational Geometry Workshop, Schloss Dagstuhl, Germany
Feb 2019 Universität Bonn, Theoretical Computer Science Seminar
Nov 2018 Goethe Universität Frankfurt, Applied Discrete Mathematics Seminar
Oct 2018 U Missouri Columbia, Convex Geometry Seminar
Mar 2018 Emerging Trends in Geometric Functional Analysis, Banff Creativity Centre
Dec 2017 Methods on Discrete Structures Lecture Series, TU Berlin
Nov 2017 Algebra Meets Numerics Workshop, Berlin Academy of Sciences
Mar 2017 U Michigan Ann Arbor, Analysis and Probability Seminar
July 2016 Geometric Functional Analysis Concentration Week, Texas A&M
Apr 2016 MIT, LIDS Seminar
Apr 2016 Georgia Tech, Algebra Seminar
Mar 2016 Univ of Chicago, Scientific Computing Seminar
Mar 2016 NC State University, Symbolic Computation Seminar
Dec 2015 Colorado State University, FRAGMENT Seminar
Oct 2015 Technical University of Munich, Applied Geometry Seminar, Germany
Sept 2015 University of Athens, Convex Geometric Analysis Seminar, Greece
Aug 2015 SUMIRFAS, Texas A&M, College Station
June 2015 Effective Methods in Algebraic Geometry (MEGA) 2015, Trento ,Italy

Service

July 2019 Organizer, SIAM Applied Algebraic Geometry Minisymposia:
 Numerical Methods for Structured Polynomial System Solving
Fall 2017 Organizer, Algorithmic Algebra OberSeminar, TU Berlin
Feb 2016 Organizer, Lecture Series on Real Stable Polynomials, Bogazici University
Jan 2016 Organizer, Combinatorial Algebraic Geometry Workshop, Nesin Math Village
Nov 2014 Member of Power Team, Texas A&M High School Contest
2014-2015 Organizer, Texas A&M Working Seminar in Discrete Mathematics

References

Teaching Timothee Bryan (Visiting Assistant Professor of Mathematics, Colgate College)
 Amin Coja-Oghlan (Professor of Discrete Mathematics, Goethe Universität Frankfurt)
 Felipe Cucker (Professor of Mathematics, City University of Hong Kong)
 Pravesh Kothari (Assistant Professor of Computer Science, Carnegie Mellon University)
 Grigoris Paouris (Professor of Mathematics, Texas A&M University)

J.Maurice Rojas (Professor of Mathematics and Computer Science, Texas A&M University)

Cynthia Vinzant (Assistant Professor of Mathematics, North Carolina State University)