

# Ilias Zadik

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## Education

- **Massachusetts Institute of Technology (MIT)** **Cambridge, MA, USA**  
*PhD, Operations Research. GPA: 5.0/5.0* *09/2014 – 06/2019 (expected)*  
Advisor: David Gamarnik.
  - **Trinity College, Cambridge University** **Cambridge, UK**  
*M.A.St. in Mathematics, Part III, with Distinction (ranked 13th out of 247 students)* *09/2013 – 07/2014*
  - **University of Athens** **Athens, Greece**  
*B.A. in Mathematics, Graduated with GPA 10/10.* *09/2009 – 02/2013*
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## Research Interests

- Probability Theory, High Dimensional Statistics and Theory of Machine Learning
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## Publications

- "Sparse High-Dimensional Regression. Algorithmic Barriers and a Local Search Algorithm" with David Gamarnik.  
*Annals of Statistics*, Major Revisions.
  - "High-dimensional Regression with Binary Coefficients. Estimating Squared error and the Phase Transition Property" with David Gamarnik.  
Submitted.  
Conference version: In Proceedings of the *Conference on Learning Theory (COLT)* 2017.
  - "A Simple Bound On The BER Of The MAP Decoder For Massive MIMO System";  
with Yuri Polyanskiy and Christos Thrampoulidis  
To appear in *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* 2019.
  - "High Dimensional Linear Regression using Lattice Basis Reduction"; with David Gamarnik.  
In Advances of *Neural Information Processing Systems (NeurIPS)* 2018
  - "Revealing Network Structure Confidentially: Improved Rates for Node-Private Graphon Estimation"; with Christian Borgs, Jennifer Chayes and Adam Smith.  
In Proceedings of the Symposium on *Foundations of Computer Science (FOCS)* 2018  
Journal version in submission to *Annals of Applied Probability*.
  - "Orthogonal Machine Learning: Power and Limitations." with Lester Mackey and Vasilis Sygkranis.  
In Proceedings of the *International Conference of Machine Learning (ICML)* 2018
  - "Mixed integer convex representability"; with Miles Lubin and Juan Pablo Vielma.  
In Proceedings of the *Integer Programming and Combinatorial Optimization* conference (IPCO) 2017.
  - "Universal Padé Approximants and their behaviour on the boundary"  
*Monatshefte für Mathematik*, Vol. 182, pp 173–193, 2017
  - "Padé approximants, density of rational functions in  $A^\infty(V)$  and smoothness of the integration operator" with V. Nestoridis.  
*J. Math. Anal. Appl.* 423 (2015) 1514-1539;
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## Submitted Papers

- “The All-or-Nothing Phenomenon in Sparse Linear Regression”; with Galen Reeves and Jiaming Xu.  
In submission to *COLT 2019*.
  - “The Overlap Gap Property in the Planted Clique Problem: An Overparametrized-Dense Subgraphs Approach”; with David Gamarnik  
In submission to *COLT 2019*.
  - “Improved bounds on Gaussian MAC and sparse regression via Gaussian inequalities”; with Yury Polyanskiy and Christos Thrampoulidis  
In submission to *ISIT 2019*.
  - “Regularity in Mixed Integer Convex Representability”; with Miles Lubin and Juan Pablo Vielma.  
In submission to *Mathematics of Operations Research*.
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## Talks

- **Revealing Network Structure, Confidentially**  
Northeastern University Theory of Computer Science Seminar, November 2018 (**Invited**)  
Symposium on Foundations of Computer Science, October 2018
  - **High Dimensional Linear Regression using Lattice Basis Reduction**  
Microsoft Research New England Machine Learning (ML) Ideas Lunch, November 2018 (**Invited**)  
Cornell University workshop for young Operations Research researchers, October 2018 (**Invited**)  
MIT LIDS and Statistics Tea talk, April 2018
  - **Orthogonal Machine Learning: Power and Limitations**  
International Conference of Machine Learning, July 2018
  - **Phase Transitions in High Dimensional Linear Regression**  
Mathematics, Information and Computation (MIC) Seminar, New York University, February 2019  
Google Research Algorithm’s Seminar, February 2019  
Stanford’s Theory of Computer Science Seminar, January 2019 (**Invited**)  
Oberwolfach’s workshop on Network Models: Structure and Functions, December 2017 (**Invited**)  
INFORMS Annual Conference, November 2017  
INFORMS Applied Probability Society Conference, July 2017 (**Invited**)
  - **High Dimensional Linear Regression with Binary Coefficients: MSE and Phase Transitions**  
Conference on Learning Theory, July 2017  
MIT LIDS and Statistics Tea talk, March 2017 (**Invited**)  
MIT LIDS student seminar, January 2017  
University of Athens Probability and Statistics Seminar, January 2017 (**Invited**)
  - **Mixed-Integer Convex Representability**  
Integer Programming and Combinatorial Optimization Conference, July 2017  
MIT Operations Research Center Student Seminar, November 2016
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## Teaching Experience

- Spring 2016-2017, Teaching Assistant for “Modern Discrete Probability”.  
Graduate class taught by Yury Polyanskiy and Guy Bresler.

- Fall 2016-2017, Teaching Assistant for “Fundamentals of Probability”. Graduate class taught by David Gamarnik.
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## Industry Experience

- Microsoft Research New England Internship (Summer 2017)  
Mentored by Jennifer Chayes and Christian Borgs.
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## Community Service

- Served as a reviewer for SIAM Journal on Discrete Mathematics, SIAM Journal on Optimization and Combinatorica.
  - Served as a sub-reviewer for COLT 2018.
  - Coordinated MIT Operations Research Seminar during Fall 2018
  - Proctored 2017 Qualifying Exams in Probability Theory for MIT Operations Research Center
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## Awards and Honors

- Honorable Mention for MIT Operations Research Center Best Student Paper Award, 2017
  - Senior scholarship from Trinity College, Cambridge University, 2014.
  - The Onassis Foundation Scholarship for Master studies, 2013-2014.
  - The Cambridge Home and European Scholarship Scheme (CHESS) award, 2013-2014.
  - IKY scholarship for top academic performance, 2009-2012.
  - International Mathematics Competition for university students (IMC):  
First Prize, 2011; Second Prize, 2010.
  - South Eastern European Mathematical Olympiad for University students (SEEMOUS):  
Gold Medal (scored 39.5/40 and ranked 1st), 2011 ; Silver Medal, 2010.
  - International Mathematical Olympiad (IMO): Honorable Mention, 2009.
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**Citizenship:** Greek. Resident in the US on an F-1 visa.