

Mert Gürbüzbalaban

CONTACT INFORMATION	Department of Management Science & Information Systems, Rutgers Business School 100 Rockafellar Road, Room 5142, Piscataway, NJ 08854 United States	Phone: (617)324-0645, E-mail: mg1366@rutgers..edu http://mert.lids.mit.edu/
RESEARCH INTERESTS	My interests lie broadly in <i>optimization</i> and <i>computational science</i> driven by applications in large-scale information, decision and infrastructure systems. My work draws and extends ideas and tools from convex optimization, probability and robust control.	
CURRENT POSITION	Rutgers University, USA - Tenure-track Assistant Professor in the Department of Management Science and Information Systems (MSIS), Rutgers Business School (Sept 2016 - present).	
PREVIOUS POSITION	Massachusetts Institute of Technology, USA - Postdoctoral Associate at the Laboratory for Information Decision Systems (LIDS) (July 2014 - Aug 2016), hosted by Prof. Asuman Ozdaglar and Prof. Pablo Parrilo.	
EDUCATION	Courant Institute, New York University, USA - Ph.D. in (Applied) Mathematics (May 2012), GPA: 4.00/4.00. <ul style="list-style-type: none">• Awarded <i>Kurt Friedrichs Prize</i> for an outstanding dissertation from the world-wide top-ranking applied mathematics department of New York University.• Advisors: Prof. Michael L. Overton and Sinan Güntürk. - M.S. in Mathematics (May 2009). École Polytechnique, France - B.Sc., M.S. (Diplôme d'ingénieur): Majors in Applied Mathematics and Economics, May 2007. Bogazici University, Turkey - B.Sc. in Electrical-Electronics Engineering, May 2005. - B.Sc. in Mathematics, May 2005. <ul style="list-style-type: none">• Valedictorian.• Specialized in signal processing.	
INDUSTRIAL POSITIONS	Bloomberg LLC, New York Full-time Quantitative Researcher and Software Developer: Developed and implemented mathematical models that extracts volatility from the options market data and predicts dividend payments and borrow cost of stocks using signal denoising techniques and seasonality pattern analysis.	05/2013 - 01/2014
	Citadel LLC, New York Full-time Quantitative Researcher: Devised and implemented mathematical models and trading strategies for high-frequency equity markets where large-scale data processing becomes the key. Analyzed, optimized strategies using parallel computing and tools from probability theory and signal processing.	2012-2013

- IN PREPARATION Mert Gürbüzbalaban and Suresh Govindaraj, *Time-delayed Stochastic Differential Equations in Accounting* (title subject to change), In preparation.
- D. Vanli, M. Gürbüzbalaban and A. Ozdaglar, *Iteration Complexity of Randomly Permuted Coordinate Descent Methods*, In preparation.
- SUBMITTED/IN REVIEW JOURNAL PAPERS A. Mokthari, M. Gürbüzbalaban, A. Ribiero, *Surpassing Gradient Descent Provably: A Cyclic Incremental Method with Linear Convergence Rate*, Submitted to SIAM Journal on Optimization, 2016. <https://arxiv.org/abs/1611.00347>
- M. Gürbüzbalaban, Asuman Ozdaglar, Pablo Parrilo, *Why Random Reshuffling Beats Stochastic Gradient Descent*, arXiv preprint arXiv:1510.08560, 2016. http://www.mit.edu/~mertg/random_shuffling.pdf
- M. Gürbüzbalaban, Asuman Ozdaglar, Pablo Parrilo, *Convergence Rate of Incremental Gradient and Incremental Newton Methods*, arxiv preprint arXiv: 1510.08562, Submitted, 2016. <https://arxiv.org/pdf/1510.08562.pdf>
- D. Vanli, M. Gürbüzbalaban, Asuman Ozdaglar, *Global Convergence Rate of Proximal Incremental Aggregated Gradient Methods*, Submitted to SIAM Journal on Optimization, In Revision, 2017. <https://arxiv.org/abs/1608.01713>
- D. Vanli, M. Gürbüzbalaban, Asuman Ozdaglar, *A Stronger Convergence Result on the Proximal Incremental Aggregated Gradient Method*, arxiv preprint # 1611.08022, 2016. <https://arxiv.org/abs/1611.08022>
- JOURNAL PUBLICATIONS **All the authors are in alphabetical order.*
- N. Guglielmi, M. Gürbüzbalaban, T. Mitchell, M.L. Overton, *Approximating the Real Structured Stability Radius with Frobenius Norm Bounded Perturbations*, Accepted, SIAM Journal on Matrix Analysis and Applications, 2017. <https://arxiv.org/pdf/1702.02486.pdf>
- M. Gürbüzbalaban, Asuman Ozdaglar, Pablo Parrilo, *On the Convergence Rate of Incremental Aggregated Gradient Algorithms*, SIAM Journal on Optimization, Accepted, 2017. <http://arxiv.org/pdf/1506.02081.pdf>
- M. Gürbüzbalaban, Asuman Ozdaglar, Pablo Parrilo, *A globally convergent incremental Newton method*, Mathematical Programming, 2015. <http://arxiv.org/abs/1410.5284>
- J. Eaton, S. Gründel, M. Gürbüzbalaban, M. Overton, *Polynomial root radius optimization with affine constraints*, Math. Programming, 2016. doi:10.1007/s10107-016-1092-5 <https://link.springer.com/article/10.1007/s10107-016-1092-5>
- N. Guglielmi, M. Gürbüzbalaban, M.L. Overton, *Fast approximation of the H_∞ norm via optimization over spectral value sets*, SIAM Journal of Matrix Analysis and Applications, 2013. <http://www.cs.nyu.edu/overton/papers/pdffiles/hinfnorm.pdf>
- M. Gürbüzbalaban, *Theory and methods for problems arising in robust stability, optimization and quantization*, PhD thesis, Mathematics, Courant Institute, New York University, 2012. <http://cs.nyu.edu/overton/phdtheses/mert.pdf>

M. Gürbüzbalaban, M.L. Overton, *Some regularity results for the pseudospectral abscissa and pseudospectral radius of a matrix*, SIAM Journal of Optimization, 2012.
<http://cims.nyu.edu/~mert/papers/varpsab.pdf>

M. Gürbüzbalaban, M.L. Overton, *On Nesterov's Nonsmooth Chebyshev-Rosenbrock Functions*, Nonlinear Analysis: Theory, Methods & Applications, 2012.
<http://dx.doi.org/10.1016/j.na.2011.07.062>

V.D. Blondel, M. Gürbüzbalaban, A. Megretski and M.L. Overton, *Explicit Solutions for Root Optimization of a Polynomial Family With One Affine Constraint*, IEEE Transactions on Automatic Control, 2012.
<http://cims.nyu.edu/~mert/papers/affpolyIEEEAC.pdf>

CONFERENCE PAPERS

M. Gürbüzbalaban, Asuman Ozdaglar, Pablo Parrilo, Denizcan Vanli *When Cyclic Coordinate Descent Beats Randomized Coordinate Descent*, Accepted, Conference on Neural Information Processing Systems (NIPS), Dec 2017.

Serhat Aybat, M. Gurbuzbalaban, *Decentralized Computation of Effective Resistances and Acceleration of Consensus Algorithms*, 5th IEEE Global Conference on Signal and Information Processing (GlobalSIP), Nov 2017.
https://www.dropbox.com/s/evizvsh6rerz7a1/globalsip_v7.pdf?dl=0

N. Vanli, M. Gurbuzbalaban, A. Ozdaglar, *Global convergence rate of incremental aggregated gradient methods for nonsmooth problems*, Proceedings of the 2016 IEEE 55th Conference on Decision and Control (CDC), December 2016.
<http://ieeexplore.ieee.org/abstract/document/7798265/>

N. Vanli, M. Gurbuzbalaban, A. Ozdaglar, *A Simple Proof for the Iteration Complexity of the Proximal Gradient Algorithm*, OPT 2016 Workshop, 30th Conference on Neural Information Processing Systems (NIPS).
http://opt-ml.org/papers/OPT2016_paper_36.pdf

A. Mokthari, M. Gurbuzbalaban, A. Ribeiro, *A Double Incremental Aggregated Gradient Method with Linear Convergence Rate for Large-scale Optimization*, 42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2017.
<https://mert.lids.mit.edu/wp-content/uploads/2017/02/icassp-2016.pdf>

J. Eaton, S. Gründel, M. Gürbüzbalaban, M. Overton, *Polynomial Stabilization with Bounds on the Controller Coefficients*, 8th IFAC Symposium on Robust Control Design (ROCOND), 2015. http://cims.nyu.edu/~mert/papers/rocond_2015.pdf

V.D. Blondel, M. Gürbüzbalaban, A. Megretski and M.L. Overton, *Explicit Solutions for Root Optimization of a Polynomial Family*, Proceedings of the 49th IEEE Conference on Decision and Control (CDC 2010).
http://ieeexplore.ieee.org/xpl/freeabs_all.jsp?arnumber=5718074

HONORS AND AWARDS

Awarded the NSF grant DMS-1723085 for \$125,000 till June 2020 2017
 XX Householder Symposium Travel Award 2017
 Society for Industrial and Applied Mathematics (SIAM) Travel Award 2015
 Kurt Friedrichs Award for the best dissertation, NYU 2013
 Henry MacCracken Fellowship, NYU 2007-2012
 French Government Scholarship (Bourse d'études), École Polytechnique 2005-2007
 Bronze Medal recipient in Ecole Polytechnique Scientific Project Competition with
 the "Biometric Iris Recognition" project. 2006
 Ranked 1st among all graduating engineering majors, all mathematics majors and
 all double major students from Bogazici University 2005
 Graduated from the double major program of Bogazici University with a double-
 major GPA record (3.98/4.00) 2005
 Nadir Orhan Bengisu Award, given to the best graduating student in the Electrical-
 Electronics Engineering Department, Bogazici University 2005
 Silver Medal in National Mathematical Olympiad, organized by Akdeniz University,
 Turkey 1999

TEACHING
EXPERIENCE

Courant Institute, New York University 2007-2014

- (Primary) Instructor for
 - Calculus (Summer 2009)
 - Multivariable Analysis (Spring 2014, graduate level)
- Teaching Assistant:
 - Partial Differential Equations for Finance (Spring 2011, graduate level)
 - Introduction to Math Analysis II (Spring 2010, graduate level)
 - Calculus I (Fall 2010)
 - Probability and Statistics (Spring 2009)
 - Probability, Statistics and Decision Making (Spring 2008)
 - Algebra and Calculus (Fall 2008)
- Grader:
 - Derivative Securities for Finance (Fall 2009)
 - Partial Differential Equations for Finance (Spring 2011, graduate level)

INDUSTRIAL
INTERNSHIP

Barclays Capital, New York Summer 2011

Quantitative Summer Associate: Implemented and calibrated a quasi-Gaussian short rate model with local volatility. Devised a hybrid model with an interest rate skew and developed a forward-induction based PDE approach for its calibration to local volatility.

Jump Trading, Chicago Summer 2010

Summer Intern: Development and implementation of novel automatized quantitative strategies for high-frequency trading of index futures

AXA Investment Managers, Quant Team, Paris Summer 2007

Summer Intern: The performance of variance reduction techniques for the pricing of exotic options with Monte-Carlo and Quasi-Monte Carlo Methods are compared using theoretical analysis and experimental study. Improved the speed of the generic Monte Carlo Pricer.

TALKS

Seminar Talks

Los Alamos National Lab, Feb 2017

Rutgers Dept. of Industrial Eng,	April 2017
NYU Courant Institute,	Feb 2017
Cornell University, Dept. of Industrial Eng. and Operations Research	Oct 2015
University of Michigan–Ann Arbor, Department of Electrical Engineering	Feb 2014
Courant Institute Mathematics Department	May 2012
Bogazici University Mathematics Department Seminar	Dec 2011
Koç University Mathematics Department Seminar	Dec 2011
École Polytechnique Fédérale de Lausanne	Dec 2011
University of Manchester Numerical Analysis Seminar	Sept 2011

Conference Talks

Allerton Conference	October 2017
Rutgers DIMACS Workshop on Distributed Optimization	August 2017
SIAM Conference in Optimization	May 2017
Householder Symposium	June 2017
Allerton Conference	October 2016
AMS Fall Southeastern Sectional Meeting, Raleigh	Nov 2016
ICIAM 2015, Beijing	Aug 2015
MOPTA 2015, Lehigh University	July 2015
ISMP 2015 Conference, Pittsburg	July 2015
Mid-Atlantic Numerical Analysis Day	Nov 2011
Householder Symposium XVIII, Tahoe City	June 2011
IEEE Conference on Decision and Control (CDC)	Dec 2010

REVIEWER FOR SIAM Journal on Optimization, Optimization Methods and Software, SIAM Journal on Control and Optimization, SIAM Journal on Scientific Computing, SIAM Journal on Matrix Analysis and Applications, BIT Numerical Mathematics, Experimental Mathematics, Journal of Nonlinear Analysis Series B: Real World Applications, Turkish Journal of Mathematics.

STUDENTS Bugra Can, PhD student in Operations Research, Rutgers Business School, 2017 - present.

Ehsan Teymourian, PhD student in Operations Research, Rutgers Business School,
2017 - present

SERVICE Admission committee for the PhD in Operations Research, advisor for the summer
research project of Ehsan Teymourian.

LANGUAGES Turkish (Native), English (Fluent), French (Fluent), German (Intermediate)