KATYA SCHEINBERG

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Education and Employment

1 Education

- **Columbia University**, School of Arts and Sciences, New York, NY
  Ph. D. in Operations Research, 1994-1997, Thesis: Issues related to interior point methods for linear and semidefinite programming. Thesis advisor: Professor D. Goldfarb.
- **Columbia University**, School of Engineering and Applied Sciences, New York, NY
  M. S. in Operations Research, 1992-1994.
- **Lomonosov Moscow State University**, Department of Computational Mathematics and Cybernetics, Moscow, Russia.
  B. S.-M. S. program, 1988-1992.

2 Employment and Affiliation History

- 07/2019-present **Professor and Director of Graduate Studies**, School of Operations Research and Information Engineering, Cornell University, Ithaca, NY
- 06/2014-06/2019 **Harvey E. Wagner Endowed Chair Professor**, Dept. of Industrial and Systems Engineering, Lehigh University, Bethlehem, PA
- 04/2018-06/2019 **co-Director**, Institute for Data, Intelligent Systems and Computation, Lehigh University, Bethlehem, PA
- 01/2017-07/2017 **Visiting Academic**, Alan Turing Institute, London, UK
- 01/2017-07/2017 **Visiting Professor**, Mathematical Institute, University of Oxford, Oxford, UK
- 09/2016-01/2017 **Visiting Researcher**, Google Research, New York, NY
- 10/2014-10/2015 **Lehigh ADVANCE Chair in Sciences, Technology, Engineering and Mathematics (STEM)**, Lehigh University, Bethlehem, PA
- 08/2010-06/2014 **Associate Professor**, Dept. of Industrial and Systems Engineering, Lehigh University, Bethlehem, PA
- 01/2010-05/2010 **Adjunct Faculty**, Department of Computer Science, New York University, New York, NY
- 03/2009-07/2010 **Research Scientist**, Department of IEOR, Columbia University, New York, NY
- 06/1997-02/2009 **Research Staff Member**, Mathematical Sciences Department, IBM Thomas J. Watson Research Center, Yorktown Heights, NY
- 01/2007-05/2007 **Adjunct Faculty**, Department of Industrial Engineering and Operations Research, Columbia University, New York, NY

- 06/2005-08/2005 **Visiting Faculty**, Department of Industrial Engineering, Bogazici University, Istanbul, Turkey.
- 09/1998 **Visiting Member**, Mathematical Sciences Research Institute, Berkeley, CA
- 05/1995-09/1995 **Summer Intern**, Mathematical Sciences Department, IBM Thomas J. Watson Research Center, Yorktown Heights, NY
- 12/1991-08/1992 **Research Assistant**, Central Economics & Mathematics Institute of the Russian Academy of Science, Moscow, Russia

3 Books

- Conn A. R., Scheinberg K., Vicente L. N.,
  Introduction to Derivative Free Optimization, MPS/SIAM Book Series on Optimization, SIAM, Philadelphia, Dec. 2008.

4 Chapters

- Conn A. R., Scheinberg K., Toint Ph. L.,
  On the convergence of derivative-free methods for unconstrained optimization. *Approximation Theory and Optimization: Tributes to M. J. D. Powell*, eds. Iserles, A. and Buhmann, M., pp 83–108, Cambridge University Press, 1997
- Scheinberg K.,
  Parametric linear semidefinite programming. In *Handbook on Semidefinite Programming*, eds. Wolkowicz, H., Saigal, R. and Vandenberghe, L., pp 92–110, Kluwer, 2000.
- Scheinberg, K., Ma, S.,
  Optimization Methods for Sparse Inverse Covariance Selection Problem. In *Optimization for Machine Learning*, eds. Sra, A., Nowozin, S. and Wright, S.J., pp 455-477, MIT Press, 2010
- Wen, Z., Goldfarb, D., Scheinberg, K.
  Block Coordinate Descent Methods for Semidefinite Programming. In *Handbook of Semidefinite, Conic and Polynomial Optimization*, eds. Anjos, M.F. and Lasserre, J.B., pp 533-564, Springer, 2012.
- Custdio, A.L., Scheinberg, K., Vicente, L. N.
  Methodologies and Software for Derivative-Free Optimization In *Advances and Trends in Optimization with Engineering Applications*, 2017.
- Chen B., Chen R., Scheinberg K.
  Volumetric Alignment of Protein-Binding Cavities In *Advances and Trends in Optimization with Engineering Applications*, 2017.
- Curtis, F., Scheinberg, K,
  Optimization Methods for Supervised Machine Learning: from Linear Models to Deep Learning In *Informs TutORials*, 2017.

5 Refereed Journal Papers

- Nemirovskii A., Scheinberg K.,
  Extension of Karmarkar's algorithm to convex quadratically constrained quadratic problems. *Mathematical Programming* 72 (1996), pp. 273-289.

- Conn A. R., Scheinberg K., Toint Ph. L.,
  Recent progress in unconstrained nonlinear optimization without derivatives. *Mathematical Programming* 79 (1997), pp. 397-414.

- Goldfarb D., Scheinberg K.,
  Interior point trajectories in semidefinite programming. *SIAM J. on Optimization* 8(4)(1998), pp. 871-886.

- Goldfarb D., Scheinberg K., Polyak R., Yusefovich B.,
  Modified barrier-penalty functions for constrained minimization problems. *Computational Optimization and Applications* 14(1) (1999), pp. 55-74.

- Goldfarb D., Scheinberg K.,
  On parametric semidefinite programming. *Applied Numerical Mathematics* 29(3) (1999), pp. 361-377.

- Fine S., Scheinberg K.,
  Efficient SVM training using low-rank Kernel representations . *J. of Machine Learning Research*, special issue on Kernel methods, 2 (2001), pp. 243-264.

- Goldfarb D., Scheinberg K.,
  A product-form Cholesky factorization method for handling dense columns in interior point methods for linear programming. *Mathematical Programming* 99 (2004), pp. 1-34.

- Goldfarb D., Scheinberg K.,
  Product-form Cholesky (LDL^T) factorization in interior point methods for second-order cone programming. *Mathematical Programming* 103 (2005), pp. 153-179.

- Scheinberg K.,
  An efficient implementation of an active set method for SVM. *Journal of Machine Learning Res.* 7 (2006), pp. 2237-2257.

- Conn A. R., Scheinberg K., Vicente L. N.,
  Geometry of interpolation sets in derivative free optimization. *Mathematical Programming*, 111 (2008), pp. 141-172.

- Goldfarb D., Scheinberg K.,
  Numerically stable LDLT factorizations in interior point methods for convex quadratic programming. *IMA Journal of Numerical Analysis*, 28 (2008), pp. 806-826.

- Conn A. R., Scheinberg K., Vicente L. N.,
  Geometry of sample sets in derivative free optimization: polynomial regression and incomplete interpolation. *IMA Journal of Numerical Analysis* 28 (2008), pp. 721-748.

- Conn A. R., Scheinberg K., Vicente L. N.,
  Global convergence of general derivative-free trust-region algorithms to first and second order critical points. *SIAM J. on Optimization*, 20 (2009) pp. 387-415.

- Zhang H., Conn A. R. and Scheinberg K.,
  A Derivative-free algorithm for the least-square minimization. *SIAM J. on Optimization*, 20(6) (2010), pp. 3555-3576.

- Scheinberg K., Toint Ph. T.,
Self-correcting geometry in model-based algorithms for derivative-free unconstrained optimization. *SIAM J. on Optimization*, 20(6), (2010), pp. 3512-3532.

- Scheinberg K., Ma S., Goldfarb D.,
Fast alternating linearization methods for minimizing the sum of two convex functions. *Mathematical Programming*, (2012), pp. 1-34.

- Bandeira A., Scheinberg K., Vicente L.N.,
Computation of sparse low degree interpolating polynomials and their application to derivative-free optimization. *Mathematical Programming* 134(1) (2012), pp. 223-257.

- Qin Z., Scheinberg K., Goldfarb D.,
Efficient block-coordinate descent algorithms for the group LASSO, *Mathematical Programming Computation* 5(2), (2013), pp. 143-169.

- Scheinberg K., Goldfarb D., Xi B.
Fast first-order methods for composite convex optimization with backtracking. *Journal of FOCM* 14, (2014), pp. 389-417.

- Bandeira A., Scheinberg K., Vicente L.N.,
Convergence of trust-region methods based on probabilistic models. *SIAM J. on Optimization*, 14(3), (2014), pp. 1238-1264.

- Xi, B., Scheinberg, K., Tütüncü., R.,
Least-squares approach to risk parity in portfolio selection, *Quantitative Finance*, 2015.

- Scheinberg K., Tang, X.,
Efficient Inexact Proximal Newton Method with Global Complexity Analysis, *Mathematical Programming Journal*, (2016), 160(2), 495-529.

- Verdeiro, A., Karas, E. W., Pedroso, L. G., Scheinberg, K.
On the construction of quadratic models for derivative-free trust-region algorithms, In *EURO Journal on Computational Optimization*, 2017.

- Chen, R., Menickelly, M., Scheinberg, K.,
Stochastic Optimization Using a Trust-Region Method and Random Models, *Mathematical Programming Journal*, 2017.

- Cartis, C., Scheinberg, K.,
Global convergence rate analysis of unconstrained optimization methods based on probabilistic models, *Mathematical Programming Journal*, 2017.

- Ghanbari, H., Scheinberg, K.,
Proximal Quasi-Newton Methods for Convex Optimization, *Computational Optimization and Applications*, 2017.

- Curtis. F. E., Scheinberg, K., Shi, R. **A Stochastic Trust Region Algorithm Based on Careful Step Normalization**. To appear in *Informs Journal of Optimization*, 2018.

- Blanchet, J., Cartis, C., Menickelly, M., Scheinberg, K.,
Convergence Rate Analysis of a Stochastic Trust Region Method via Submartingales, *Informs Journal of Optimization*, 2018.

- Paquette, C., Scheinberg, K.,
A Stochastic Line Search Method with Convergence Rate Analysis, *SIAM Journal on Optimization*, 2019.

- Pirhooshyaran, M. Snyder L., Scheinberg K.,
Feature Engineering and Forecasting via Derivative-free Optimization and Ensemble of Sequence-to-sequence Networks with Applications in Renewable Energy, *Energy*, 2020.

- Nguyen, L., Scheinberg, K., Takáč, M.
Inexact SARAH Algorithm for Stochastic Optimization. *Optimization Methods and Software*, 2020.

- Curtis, F.E. Scheinberg, K.
Adaptive Stochastic Optimization, *IEEE Signal Processing Magazine*, 2020.

- Berahas, A. Cao, L., Scheinberg, K.
Global Convergence Rate Analysis of a Generic Line Search Algorithm with Noise, *SIAM Journal on Optimization*, 2021.

- Gunluk, O., Li, M. Menickelly, M., Kalagnanam, J., Scheinberg, K.,
Optimal Generalized Decision Trees via Integer Programming, *Journal of Global Optimization*, 2021.

- Berahas, A.S., Cao, L., Choromanski, K., Scheinberg K., **A Theoretical and Empirical Comparison of Gradient Approximations in Derivative-Free Optimization**, *Foundations of Computational Mathematics*, 2021.

- Scheinberg, K. **Finite Difference Gradient Approximation: To Randomize or Not?**, *INFORMS Journal on Computing*, 2022.

6 Refereed Conference Proceedings

- Conn A. R., Scheinberg K., Toint Ph. L.,
A derivative free optimization algorithm in practice. In Proceedings of *7th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization*, St. Louis, MO, 1998.

- Fine S., Scheinberg K.,
Incremental learning and selective sampling via parametric optimization framework for SVM. In *Advances in Neural Information Processing Systems* 14 (2002), pp. 705-711.

- Campbell M., Ebadollahi S., Joshi D., Naphade M., Natsev A., Seidl J., Smith J.R., Scheinberg K., Tesic J., and Xie L.,
IBM Research TRECVID-2006 Video Retrieval System. In Proceedings of *TREC Video Retrieval Evaluation 2006*.

- Xie L., Xu D, Ebadollahi S., Scheinberg K., Chang Sh-F. and Smith J.R.,
Detecting generic visual events with temporal cues. In Proceedings of *40th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October 2006.

- Bani Asadi N., Rish I., Scheinberg K., Kanevsky D., Ramabhadran B.,
A Bayesian approach to learning sparse gaussian Markov networks. In Proceedings of *ICASSP 2009*

- Scheinberg K., Ma S., Goldfarb D.,
Sparse inverse covariance selection via alternating linearization methods. In Proceedings of *NIPS 2010* (24% acceptance rate).

- Chen B., Chen R., Scheinberg K.,
Aligning ligand binding cavities by optimizing superposed volume. Proceedings of *IEEE BIBM 2012*.

- Chen, B., Guo, Z., Hong, J., Scheinberg, K.,
Superposition of Protein Structures Using Electrostatic Isopotentials. To appear in Proceedings of *IEEE BIBM 2015*.

- Nguyen, L., Liu, J., Scheinberg, K., Takáč, M.
SARAH: A novel method for machine learning problems using stochastic recursive gradient. In Proceedings of *ICML 2017*.

- Nguyen, L., Nguyen, Ph. H., van Dijk, M, Richtarik, P., Scheinberg, K., Takáč, M.
SGD and Hogwild! Convergence Without the Bounded Gradients Assumption. In Proceedings of *ICML 2018*.

- Ghanbari, H., Li, M., Scheinberg, K.,
Novel and Efficient Approximations for Zero-One Loss Functions of Linear Classifiers. Proceedings of *NeurIPS workshop "Beyond First-Order"*, 2019.

- Jin, B., Scheinberg, K., Xie, M.**High Probability Complexity Bounds for Line Search Based on Stochastic Oracles**, Proceedings of *NeurIPS 2021*.

- Jin, B., Scheinberg, K., Xie, M. **High Probability Step Size Lower Bound for Adaptive Stochastic Optimization**, Proceedings of *NeurIPS OPT Workshop*, 2021.

- Tran, T.H. Scheinberg, K., Nguyen L. M. **Nesterov Accelerated Shuffling Gradient Method for Convex Optimization**, Proceedings of *ICML 2022*.

7 Non-refereed Publications

- Scheinberg K.
Geometry in model-based algorithms for derivative-free unconstrained optimization. *Optima, MPS Newsletter* 79 (2009).

- Scheinberg K.
Evolution of randomness in optimization methods for supervised machine learning. *SIAG/OPT Views and News* Volume 24 Number 1, 2016.

- Scheinberg K.
Knowing what to know in stochastic optimization. *SIAM News* March 2019.

8 Submitted Publications

- Cao, L., Berahas, A.S., Scheinberg, K. **First-and Second-Order High Probability Complexity Bounds for Trust-Region Methods with Noisy Oracles**, 2022.

- Jin, B., Scheinberg, K., Xie, M. **High Probability Complexity Bounds for Adaptive Step Search Based on Stochastic Oracles**, 2022.

9 Technical Reports

- Conn A. R., Scheinberg K., Toint Ph. L.,
  Manual for FORTRAN software package DFO v1.2. Technical report, www.coin-or.org, 2000

- Fine S., Scheinberg K.,
  Incas: An incremental active set method for SVM. Technical Report, IBM Research Labs, Haifa 2002.

- Wen Z., Goldfarb D., Ma S., Scheinberg K.,
  Row by row method for semidefinite programming. Technical Report, 2009.

- Scheinberg K., Rish, I.,
  SINCO - a greedy coordinate ascent method for sparse inverse covariance selection problem. Technical Report, 2009.

- Bandeira A., Scheinberg K., Vicente L.N.,
  On partially sparse recovery. Technical report, 2012.

- Scheinberg, K., Xi, B.
  Alternating direction methods for non convex optimization with applications to second-order least-squares and risk parity portfolio selection, 2015.

- Ghanbari, H., Scheinberg, K.,
  Black-box Optimization in Machine Learning with Trust-Region Based Derivative Free Algorithms, Technical Report, 2017.

- Nguyen, L., Liu, J., Scheinberg, K., Takáč, M.
  Stochastic Recursive Gradient Algorithm for Nonconvex Optimization, Technical Report, 2017.

- Hatalis, K., Lamadrid, A. J., Scheinberg, K., Kishore, S.
  Smooth Pinball Neural Network for Probabilistic Forecasting of Wind Power, Technical Report, 2017.

10 Software

- **DFO**,
  Fortran 77 package for general nonlinear derivative-free constrained optimization problems.Version 1.0 released in 1999, Version 2.0 released in 2002, updated in 2006. The code is a part of COIN-OR software repository *www.coin-or.org* which is an internationally recognized repository of open source optimization software sponsored by INFORMS.

- **SVM-QP**,
  Fortran 77 package for large-scale convex quadratic problems arising in support vector machines. Released in 2006. The code is a part of COIN-OR software repository *www.coin-or.org* which is an internationally recognized repository of open source optimization software sponsored by INFORMS.

- **Sparse Covariance Selection**,
  C++/Matlab package for convex problems arising in sparse inverse covariance selection. Released in 2009. The code is a part of COIN-OR software repository *www.coin-or.org* which is an internationally recognized repository of open source optimization software sponsored by INFORMS.

11 Patent

- **U.S. patent 7,117,455,**
  System and method for derivative-free optimization of electrical circuits.
  Walker S. G., Visweswariah C., Scheinberg K., and Restle P. J., issued October 2006.

12 Awards and Recognitions

- INFORMS Fellow, 2022.
- Outstanding Simulation Publication Award, by INFORMS Simulation Society. 2021.
- Farkas Prize of the INFORMS Optimization Society, 2019.
- Lagrange Prize in Continuous Optimization, 2015. Received jointly with Andrew R. Conn and Lus Nunes Vicente for the manuscript "Introduction to Derivative Free Optimization".
- IBM Research Division Award for contributions to COIN-OR, 2007.
- IBM Technical Group Award for contributions to COIN-OR, 2003.
- Honorable Mention in the 1997 George E. Nicholson student paper competition.
- NSF Postdoctoral Fellowship in Mathematical Sciences, 1997 (declined).
- IBM Cooperative Fellowship, 1995-1997.
- Scholarship for Academic Excellence, Moscow State University, 1988-1992.

13 Research Grants

- NSF Grant CCF 1740796 **Amendment to TRIPODS Institute for Optimization and Learning**, January 1, 2022-August 31, 2022. $50,656
- ONR Grant N00014-22-1-2154 **Stochastic Foundation Oracles and Their use in Convergent Optimization Algorithms** PI, January 1, 2022-December 31, 2024 $500,000.
- NSF Grant CCF 2140057 **AF: Small: A Unified Framework for Analyzing Adaptive Stochastic Optimization Methods Based on Probabilistic Oracles** PI, January 1, 2022-December 31, 2024 $500,000, with Frank Curtis, Lehigh University.
- NSF Grant CCF 2008434 **REU amendment to AF: Small: Adaptive Optimization of Stochastic and Noisy Function**, May 31, 2021-December 31, 2022 $16,000.
- NSF Grant CCF 2008434 **AF: Small: Adaptive Optimization of Stochastic and Noisy Function** PI, October 1, 2020-September 30, 2021 $170,000, with Frank Curtis, Lehigh University.
- NSF TRIPODS+X Grant **TRIPODS+X:VIS: The DISC Institute workshop series on Machine Learning + X**, PI, $200,000 recommended for funding, August 2018.
- DARPA Grant DARPA-Lagrange N660011824026 **Novel Methods for Stochastic Data-Driven Nonconvex Optimization,** co-PI, April 1, 2018-September 30, 2019, $250,000 of the $750,000 total with Northwestern U.
- Google Faculty Award **Scalable Derivative Free Optimization for Reinforcement Learning and Robotics**, $56,500, March, 2018,

- NSF Grant CCF 1740796 **TRIPODS Institute for Optimization and Learning** PI, January 2018-December 2020, $1,500,000 with Frank Curtis and Martin Takac of ISE, Lehigh, Han Liu, Northwestern University and Francesco Orabona, SUNY at Stony Brook.
- NSF Grant CCF 1618717 **AF: Small: New Classes of Optimization Methods for Nonconvex Large Scale Machine Learning Models,** PI, September, 2016-August 31, 2019 $500,000, with Frank Curtis and Martin Takac of ISE, Lehigh.
- Yahoo FREP Award **Enhancing ad placement classification using hierarchical structure.** $25,000. 2014-2015.
- NSF Grant DMS-1319356 **Randomized Models for Nonlinear Optimization: Theoretical Foundations and Practical Numerical Methods,** PI, September, 2013-August 31, 2016 $200,000, with Frank Curtis of ISE, Lehigh.
- NSF Grant CCF-1320137 **AF: Small: Volumetric Alignment of Protein Cavities for the Analysis of Ligand Binding Specificity,** Co-PI January 1, 2014-December 31, 2016, $445,000, with Brian Y. Chen, CSE, Lehigh University.
- DARPA Grant DARPA-12-01-GRAPHS-FP-016 **Prospective Analysis of Large and Complex Partially Observed Temporal Social Networks,** co-PI, July 1, 2012-June 30, 2016, $500,000 of the $2,907,908 total with Temple U. and U. of Washington.
- AFOSR Grant FA9550-11-1-0239 **Derivative Free Optimization of Complex Systems with the use of Statistical Machine Learning Models,** PI, August 16, 2011-August 15, 2014, $265,820.00.
- NSF Grant DMS-1016571 **Fast First-Order Methods for Large-Scale Structured and Sparse Optimization**,c o-PI, September 1, 2010 - August 31, 2013, $75,000 of the $450,000 total (with D. Goldfarb and G. Iyengar of Columbia University).
- Lehigh Faculty Innovation Grant **Atom Independent Alignment for the Volumetric Comparison of Protein Binding Pockets by Optimization,** co-PI, July 1, 2011-June 30, 2012 $24,480 with Brian Chen of CSE Department at Lehigh.

14 Editorial board membership and activities

- Mathematics of Operations Research, 2019-present, editor-in-chief.
- Mathematical Programming, Series A, 2018-present, co-editor.
- SIAM J. on Mathematics of Data Science , 2018-2018, Associate editor.
- Mathematical Programming, Series A, 2016-2018, Associate editor.
- SIAM-MOS Book Series on Optimization Editor-in-Chief, 2014 - 2018.
- SIAM J. on Optimization, 2011-2018, Associate editor in the area of derivative-free optimization, machine learning, compressed sensing and large scale optimization.
- SIAM Mathematics in Industry Book series, 2012-2014, member of the editorial board.
- Optima - the newsletter of Mathematical Programming Society, 2006-2010 - member of editorial board, 2011-2013 - the editor.

15 Plenary and Semiplenary conference presentations

07/05: "Geometry of Sample Sets in Derivative Free Optimization", invited semiplenary, **FOCM'05**, Santander, Spain.

08/07: "Model based derivative free optimization", invited semiplenary talk, **ICCOPT** (more than 400 participants), Hamilton, Canada.

12/08: "Recent advances in model based derivative free optimization", invited plenary talk, VOCAL Conference, Vezsprem, Hungary.

07/10: "Accelerating first order methods in convex optimization", invited plenary talk, Workshop on Nonlinear Optimization, Variational Inequalities and Equilibrium Problems, Erice, Italy.

01/11: "Machine Learning for Optimization", invited plenary talk, Ninth US-Mexico Workshop on Optimization and its Applications, Oaxaca, Mexico.

08/12: "Using Random Models in Derivative Free Optimization", invited semiplenary talk, **International Symposium of Mathematical Programming** (2000 participants), Berlin, Germany.

12/14: "Classical unconstrained optimization based on "occasionally accurate" random models", invited semiplenary, **FOCM'14**, Montevideo, Uruguay.

05/17: "Optimization methods in machine learning", invited plenary, **Optimization Days**, Montreal, Canada.

05/17: "Using curvature information in optimization methods for machine learning problems", invited plenary, **SIAM Conference on Optimization**, Vancouver, Canada.

10/17: "Optimization Methods for Supervised Machine Learning: from Linear Models to Deep Learning", invited tutorial, **INFORMS'17**, Houston, USA.

09/18: "New Framework for Convergence Analysis of Stochastic Optimization Methods, invited speaker, **Princeton Day of Optimization.**

10/21: "Stochastic Oracles and Where to Find Them", invited keynote, **INFORMS Annual Meeting**, Anaheim, CA

01/21: "Stochastic Oracles and Where to Find Them", invited plenary, **Annual Conference on the Mathematics of Operations Research in the Netherlands**, Virtual.

01/22: "Stochastic Oracles and Where to Find Them", invited plenary, **INFORMS CS Conference**, Tampa, FL

16 Teaching and Research Advising

Teaching outside Lehigh and Cornell

- Columbia University Doctoral level course on Nonlinear Optimization, Spring 2007.
- University of Bologna Short Course on Convex Optimization, Summer 2009.
- Columbia University Graduate level course on Optimization in Machine Learning, Fall 2009.
- New York University Graduate level course on Optimization in Machine Learning, Spring 2010.

- University of Texas at Austin Short Course on Optimization in Machine Learning, Spring 2011.

Teaching at Lehigh

- ISE 426 "Optimization Models and Applications", Fall 2010, Fall 2011, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2018 - Graduate level course (55-80+ students). Organization/Effectiveness Evaluations: Instructor: 4.62/4.44, Department: 4.54/4.48, College: 4.33/4.14, University: 4.44/4.30
- ISE 220 "Introduction to Operations Research", Spring 2011, Spring 2012 - Undergraduate level course. Organization/Effectiveness Evaluations: Instructor: 4.39/4.74, Department: 4.38/4.62, College: 4.31/4.65
- ISE 240 "Introduction to Deterministic Models of Operations Research", Spring 2013 - Undergraduate level course.
- ISE 444 "Optimization Methods in Machine Learning", Fall 2011, Fall 2012, Spring 2014, Spring 2016, Spring 2018 - PhD level course. Overall Effectiveness Evaluations: Instructor: 4.9, Department: 4.19, College: 4.06.
- EBG 5 ISE Lab Fall 2017 - freshmen undergraduate lab.

Teaching at Cornell

- ORIE 7390 "Special Topics in Mathematical Programming", Fall 2019, PhD elective course.
- Math 2940 "Linear Algebra for Engineers", Spring 2020, Spring 2022 - Required course for all Engineering undergraduate students (500 students). Organization Evaluation: 3.05.
- ORIE 6300 "Mathematical Programming I", Fall 2020, Fall 2021, Fall 2022 - Required core PhD level course. Effectiveness Evaluations: 3.90, Department 3.93.

Undergraduate advising:

- Amin Benalia September 2022-present.
- Nina Tang March 2021-May 2022.
- Tomer Shamir March 2021-December 2021.

Master's advising:

- Hanzhu Ni: August 2010-August 2011.
- Ana Alexandrescu: August 2010-January 2012.
- Zhongyuan Wei: June 2011-June 2012.
- Changgeng Su: August 2012-August 2013.
- Yuying Wang: August 2012-August 2013.

PhD advising:

- Bai Xi: September 2010-May 2015.
- Ruobing Chen: September 2010-Jan 2015.
- Xiaocheng Tang: September 2010-August 2015.
- Adriano Verdeiro: September 2012-December 2012. A visiting pre-doctoral fellow from Brazil.
- Alireza Yektaramam: September 2012-2017.

- Matthew Menickelly: September 2012-2017.
- Hiva Ghanbari: September 2013-August 2018. Now at Argonne National Labs
- Kursat Kemikli: September 2015-2016.
- Rui Shi: September 2015-June 2019.
- Liyuan Cao: September 2016-May 2021. Now a Postdoctoral Fellow at Peking University.
- Lam Nguyen: September 2016 - August 2018. Now at IBM Research.
- Sarper Aydin: September 2017- June 2019.
- Minhan Li: June 2018-June 2019.
- Miaolan Xie: June 2020-present.
- Si Yi (Cathy) Meng: August 2020-present.
- Trang Tang: August 2020-present.

17 Selected University Service

- Director of Graduate Studies, ORIE Field, July 2020-present.
- Faculty Search Committee, ORIE, 2019-2020.
- College of Arts and Sciences Dean search committee, 2018.
- Data Science college-wide faculty search committee, 2017-2018.
- Data Science and Computational Intelligence council, co-chair, College of Engineering, Lehigh, 2017-2018.
- PhD program director ISE department, Jan 2012-present. Advising over 40 PhD students.
- Lehigh ADVANCE Chair, member of ADVANCE leadership team. 2014-present.
- Conference Chair for MOPTA 2011 conference hosted by Lehigh and organized by ISE department, 2010-2011.
- ISE Department senior faculty search committee co-chair, 2013-2014.
- ISE Department junior faculty search committee, 2010-2011, 2012-2013, 2013-2014, 2015-2016.
- Simulation of Infrastructure Systems Faculty Search faculty search committee, 2010-2011.
- Energy/ Smart Grid cluster faculty search committee, 2012-2013.
- CSE Junior faculty search committee, 2012-2013, 2015-2016.

18 Conference and workshops organizing committees

- **Mathematical Programming in Data Mining and Machine Learning**, June 2005, McMaster University, Program Committee Co-Chair.
- **NIPS 2005 Workshop on the Accuracy-Regularization Frontier**, December 2005, Whistler, Organzing Committee Member.
- **Eighth US-Mexico Workshop on Optimization and its Applications**, January 2007, Huatulco, Mexico, Program Committee Member.

- **Mathematical Programming in Data Mining and Machine Learning**, January 2007, Banff International Research Station, Program Committee and Organizing Committee Chair.
- **SIAM Conference on Optimization**, May 2008, Boston, Program Committee Member.
- **FOCM'08 Optimization Workshop**, June 2008, Hong Kong, Program Committee Co-Chair.
- **ISMP 2009**, August 2009, Chicago, IL. Cluster co-chair in derivative free optimization.
- **SIAM Annual Meeting** July 2010, Pittsburgh, Program Committee Member.
- **Ninth US-Mexico Workshop on Optimization and its Applications**, January 2011, Oaxaca, Mexico, Program Committee Member.
- **FOCM'11 Optimization Workshop**, June 2011, Budapest, Program Committee Co-Chair.
- **Summer Course and Workshop on Optimization in ML** June 2011, University of Texas in Austin, Austin, TX, Organizing Committee Co-Chair.
- **MOPTA'11**, August 2011, Bethlehem, PA, Program Committee and Organizing Committee Chair.
- **Workshop on Optimization in ML, ICML'12** July 2012, Edinburgh, Scotland, Program Committee Chair.
- **MOPTA'12'13'14'15**, Bethlehem, PA, Program Committee and Organizing Committee Member.
- **ICCOPT'13**, July 2013, Lisbon, Portugal, Program Committee Chair.
- **INFORMS'15**, October 2015, Philadelphia, PA, Keynote and Plenary Chair.
- **Tenth US-Mexico Workshop on Optimization and its Applications**, January 2016, Merida, Mexico, Program Committee Member.
- **ICML Workshop "Optimization Methods for the Next Generation of Machine Learning", 2016, New York**
- **Eleventh US-Mexico Workshop on Optimization and its Applications**, January 2018, Huatulco, Mexico, Program Committee Chair.
- **DIMACS/TRIPODS Workshop on Optimization and Machine Learning**, August 2018, Bethlehem, PA, Program Committee and Organizing Committee Chair.
- **TRIPODS/MOPTA'18**, August 2018, Bethlehem, PA, Program Committee and Organizing Committee Chair.
- **International Symposium on Mathematical Programming 2021-2022**, Program Committee Chair.
- **SIAM Conference on Optimization 2023** Co-chair.

19 Other services and professional activities

INFORMS Optimization Society Best Student Paper prize committee:

- 2011 Committee Member
- 2012 Committee Chair

MOS Beale Orchard Hays prize committee:

- 2015 Committee Member

SIAM-MOS Lagrange Prize Committee Chair 2017-2018

INFORMS Optimization Society Young Researcher prize committee:

- 2015 Committee Member
- 2018 Committee Chair

MOS Publication Committee member

Book proposal reviews regular, for SIAM and Springer

SIAM Activity Group on Optimization Chair 2020-present.

INFORMS Optimization Society Farkas prize committee:

- 2021 Committee Member
- 2022 Committee Chair

INFORMS Computing Society prize committee:

- 2021 Committee Chair

SIAG/OPT Test of Time Award committee:

- 2022 Committee Chair