

Matey N. Neykov, Ph.D.

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mneykov@northwestern.edu

CURRICULUM VITAE	May 2026	
CURRENT POSITION	Assistant Professor, Department of Statistics and Data Science Northwestern University	Evanston IL 2023 –
	Adjunct Professor, Department of Statistics & Data Science Carnegie Mellon University	Pittsburgh PA 2024 –
EDUCATION	Harvard University Ph.D., Biostatistics, May 2015 Dissertation: <i>Three Aspects of Biostatistical Learning Theory</i> Advisors: Jun S. Liu, Tianxi Cai A.M., Biostatistics, May 2012	Cambridge MA
	Sofia University B.S., Applied Mathematics, September 2009	Sofia Bulgaria
PAST POSITIONS	Associate Professor (without tenure), Department of Statistics & Data Science Carnegie Mellon University	Pittsburgh PA 2022 – 2023
	Assistant Professor, Department of Statistics & Data Science Carnegie Mellon University	Pittsburgh PA 2017 – 2022
	Postdoctoral Research Associate, ORFE, Princeton University Mentor: Han Liu	Princeton NJ 2015 – 2017
RESEARCH INTERESTS	High Dimensional Inference, Graphical Models, Statistical Machine Learning, Convex Analysis and Optimization, Empirical Processes and Random Matrix Theory, Statistical Applications in Biomedical Settings	
HONORS AND AWARDS	Princeton University IMS Travel Award, 2016 NIPS Travel Award, 2016 CMACS Travel Award, 2016	Princeton NJ
	Harvard University Certificate of Distinction in Teaching, 2015 IMS Travel Award, 2015 PQG Travel Award, 2014 Robert Balentine Reed Prize, 2012	Cambridge MA

HUSEC graduate student fellowship, 2011 & 2012

Sofia University

Sofia Bulgaria

Graduated with honors, first in the class, 2009

National Programming Contest for College Students, 2009 (3rd place)

ACM ICPC South-Eastern Europe Regional competition, 2007 (top 15)

ACM ICPC South-Eastern Europe Regional competition, 2006 (HM)

National Programming Contest for College Students, 2006 (3rd place)

Sofia High School of Mathematics

Sofia Bulgaria

All Russian Mathematics Olympiad, 2005 (HM)

Balkan Mathematics Olympiad, 2005 (Bronze Medal)

All Russian Mathematics Olympiad, 2004 (HM)

International Mathematics Olympiad Tyimaada, 2004 (Silver Medal)

Balkan Mathematics Olympiad, 2004 (Silver Medal)

International Mathematics Olympiad Tyimaada, 2003 (Silver Medal)

Junior Balkan Mathematics Olympiad, 2001 (Silver Medal)

PAPERS &
PUBLICATIONS

*starred names indicate student or postdoc co-authors

27. I. Kim, L. Wasserman, S. Balakrishnan and **M. Neykov** “Semi-Supervised U-statistics”, *The Annals of Statistics*, to appear 2025+
26. A. Prasad* and **M. Neykov** “Characterizing the minimax rate of nonparametric regression under bounded convex constraints”, *Electronic Journal of Statistics*, to appear 2025+
25. A. Prasad* and **M. Neykov** “Information theoretic limits of robust sub-Gaussian mean estimation under star-shaped constraints”, *The Annals of Statistics*, to appear 2025+
24. A. Prasad* and **M. Neykov** “Some facts about the optimality of the LSE in the Gaussian sequence model with convex constraint”, *IEEE Transactions on Information Theory*, to appear 2025+
23. I. Kim, **M. Neykov**, S. Balakrishnan, L. Wasserman “Conditional Independence Testing for Discrete Distributions: Beyond χ^2 - and G -tests”, *Electronic Journal of Statistics*, to appear 2024+
22. **M. Neykov**, L. Wasserman, I. Kim, S. Balakrishnan “Nearly Minimax Optimal Wasserstein Conditional Independence Testing”, *Information and Inference: A Journal of the IMA*, 2024
21. Y. Yi* and **M. Neykov** “Non-Asymptotic Bounds for the ℓ_∞ Estimator in Linear Regression with Uniform Noise”, *Bernoulli*, 2024
20. Y. Cao, **M. Neykov**, H. Liu, “High-Temperature Structure Detection in Ferromagnets”, *Information and Inference: A Journal of the IMA*, 2022, *arXiv preprint*, [arXiv:1809.08204](https://arxiv.org/abs/1809.08204)
19. I. Kim, **M. Neykov**, S. Balakrishnan and L. Wasserman “Local permutation tests for conditional independence”, *The Annals of Statistics*, 2022
18. M. Li*, **M. Neykov** and S. Balakrishnan “Minimax Optimal Conditional Density Estimation under Total Variation Smoothness”, *Electronic Journal of Statistics*, 2022
17. **M. Neykov** “On the minimax rate of the Gaussian sequence model under bounded convex constraints”, *IEEE Transactions on Information Theory*, 2022
16. Y. Zhang, Molei Liu, **M. Neykov** and T. Cai, “Prior Adaptive Semi-supervised Learning with Application to EHR Phenotyping”, *Journal of Machine Learning Research (JMLR)*, 2022
15. **M. Neykov**, S. Balakrishnan, L. Wasserman, “Minimax Optimal Conditional Independence Testing”, *The Annals of Statistics*, 2021, <https://arxiv.org/pdf/2001.03039.pdf>

14. **M. Neykov**, Z. Wang and H. Liu, “Agnostic estimation for misspecified phase retrieval models”, *Journal of Machine Learning Research (JMLR)*, 2020, *Advances in Neural Information Processing Systems (NIPS)*, 2016 (short version)
13. **M. Neykov**, “Gaussian Regression with Convex Constraints“, *Proceedings of Machine Learning Research Volume 89, AISTATS*, 2019
12. **M. Neykov** “Isotonic Regression Meets LASSO“, *Electronic Journal of Statistics*, 2019
11. **M. Neykov**, “Tossing Coins Under Monotonicity“, *Proceedings of Machine Learning Research Volume 89, AISTATS*, 2019
10. **M. Neykov** and H. Liu, “Property testing in high dimensional Ising models”, *The Annals of Statistics*, 2019, *arXiv preprint, arXiv:1709.06688*
9. **M. Neykov**, J. Lu and H. Liu, “Combinatorial inference for graphical models”, *The Annals of Statistics*, 2019, *arXiv preprint, arXiv:1608.03045*
8. Z. Yang, L. F. Yang, E. X. Fang, T. Zhao, Z. Wang, **M. Neykov**, “Misspecified Nonconvex Statistical Optimization for Sparse Phase Retrieval”, *arXiv preprint, arXiv:1510.08986*, *Mathematical Programming Series B*, 2019
7. **M. Neykov**, Y. Ning, J. S. Liu and H. Liu, “A unified theory of confidence regions and testing for high dimensional estimating equations”, *Statistical Science*, 2018, *arXiv preprint, arXiv:1510.08986*
6. **M. Neykov**, B. Hejblum and J. Sinnott, “Kernel machine score test for pathway analysis in the presence of semi-competing risks”, *Statistical Methods in Medical Research*, 2016
5. **M. Neykov**, Q. Lin and J. S. Liu, “Signed support recovery for single index models in high-dimensions”, *Annals of Mathematical Sciences and Applications*, 2016
4. **M. Neykov**, J. S. Liu and T. Cai, “ L_1 -regularized least squares for support recovery of high dimensional single index models with Gaussian designs”, *Journal of Machine Learning Research (JMLR)*, 2016
3. **M. Neykov**, J. S. Liu and T. Cai, “On the characterization of a class of Fisher-consistent loss functions and its application to boosting”, *Journal of Machine Learning Research (JMLR)*, 2016
2. R. Payne’, **M. Neykov**’, M. K. Jensen and T. Cai, “Kernel machine testing for risk prediction with stratified case cohort studies”, *Biometrics*, 2015; ’equal contribution
1. S. Yu, K.K. Kumamaru, E. George, R.M. Dunne, A. Bedayat, **M. Neykov**, A.R. Hunsaker, K.E. Dill, T. Cai, and F.J. Rybicki “Classification of CT pulmonary angiography reports by presence, chronicity, and location of pulmonary embolism with natural language processing”, *Journal of Biomedical Informatics*, 2014

Under Review

7. **M. Neykov** “Fast Near-Optimal Estimation over Symmetric Norm Balls”, 2026
6. Y. Li*, **M. Neykov** “Efficient Robust Constrained Signal Detection via Kolmogorov Width Approximations”, 2026
5. T. Peng*, A. Prasadana, **M. Neykov** “Robust mean estimation under star-shaped constraints with heavy-tailed noise”, 2026
4. **M. Neykov** “Polynomial-Time Near-Optimal Estimation over Certain Type-2 Convex Bodies”, 2025
3. Y. Li*, **M. Neykov** “Robust Signal Detection with Quadratically Convex Orthosymmetric Constraints”, 2026
2. X. Liu* and **M. Neykov** “Robust density estimation over star-shaped density classes”, 2025

1. G. Yi* and **M. Neykov** “Nonparametric Exponential Family Regression Under Star-Shaped Constraints”, 2025

Unpublished Manuscripts

6. S. Shrotriya* and **M. Neykov** “Adversarial Sign-Corrupted Isotonic Regression”, 2022
5. S. Shrotriya* and **M. Neykov** “Revisiting Le Cam’s Equation: Exact Minimax Rates over Convex Density Classes”, 2022
4. Y. Yi* and **M. Neykov** “A New Perspective on Debiasing Linear Regressions”, 2021
3. Y. Yi* and **M. Neykov** “Non-Sparse PCA in High Dimensions via Cone Projected Power Iteration”, 2020
2. A. Chakraborty, **M. Neykov**, R. Carroll and T. Cai, “Surrogate aided unsupervised recovery of sparse signals in single index models for binary outcomes”, *arXiv preprint, arXiv:1701.05230*, 2017
1. J. Lu, **M. Neykov** and H. Liu, “Adaptive inferential method for monotone graph invariants”, *arXiv preprint, arXiv:1707.09114*, 2017

SOFTWARE

R package **kernscr**; Kernel Machine Score Test for Pathway Analysis in the Presence of Semi-Competing Risks; Available on [CRAN]

ACADEMIC EXPERIENCE

Princeton University Princeton NJ
Postdoctoral Research Associate, Mentor: Han Liu **2015 – 2017**

Harvard University Cambridge MA
Dissertation Research, Advisors: Jun S. Liu, Tianxi Cai **2010 – 2015**

TEACHING EXPERIENCE

Northwestern University Evanston IL
Instructor: Data Visualization, STAT 302 **Fall 2023, Fall 2024, Winter 2024**

Instructor: Advanced Statistical Theory 1 & 2, STAT-461 & STAT-450 **Fall 2023, Fall 2024, Winter 2024, Winter 2025**

Instructor: Independent Study STAT-499 **Spring 2025 (4 students)**

Carnegie Mellon University Pittsburgh PA
Instructor: Advanced Statistical Theory I, 36-709 **Spring 2023**

Instructor: Advanced Statistical Inference I (MINI), 36-747 **Fall 2022**

Instructor: Advanced Statistical Inference II (MINI), 36-748 **Fall 2022**

Instructor: Multivariate Analysis I (MINI), 36-755 **Spring 2022**

Instructor: Multivariate Analysis II (MINI), 36-756 **Spring 2022**

Instructor: Advanced Statistical Theory I, 36-709 **Spring 2021**

Instructor: Introduction to Statistical Inference, 36-226 **Fall 2020**

Co-Instructor: Advanced Statistical Theory II, 36-710 **Fall 2019**

Instructor: Statistical Graphics and Visualization, 36-315 **Fall 2017, 2018, 2020; Spring 2018**

Harvard University

Cambridge MA

Instructor:

Linear Algebra and Real Analysis, *Math camp for incoming PhD Students* **August, 2014**

Key Concepts: Linear Operators, Hilbert Spaces, Spectral Theorem, Fundamental Theorems of Calculus, Convergent Sequences & Series

Probability Theory, *Math camp for incoming PhD Students*

August, 2013

Key Concepts: Elementary Set & Measure Theory, Combinatorics, Discrete & Continuous Random Variables, CLT, LLN, Concentration Inequalities

Problem Solving in Advanced Statistics, *PhD level class*

Fall, 2012; Spring, 2013

Key Concepts: Coach for the theory part of the Qualifying Exam

Teaching Assistant:

Statistical Inference II, *PhD level class*

Spring, 2015

Professors: Andrea Rotnitzky & Giovanni Parmigiani

Key Concepts: Semi-parametric & Decision Theory, Influence Functions, Minimax & Bayesian Estimation and Hypothesis Testing

Statistical Inference II, *PhD level class*

Spring, 2014

Professor: Tianxi Cai

Key Concepts: Asymptotics of M-Estimation, Kernel Smoothing, U-Statistics, Empirical Processes

Analysis of Multivariate and Longitudinal Data, *PhD level class*

Spring, 2013

Professor: Xihong Lin

Key Concepts: Multivariate Analysis, Generalized Linear Models, Linear & Generalized Linear Mixed Models, Generalized Estimating Equations

Analysis of Rates and Proportions, *Master of Public Health level class*

Spring, 2011

Professor: Robert Glynn

Key Concepts: One and two sample T-tests, ANOVA, MANOVA

Sofia University

Sofia Bulgaria

Teaching Assistant:

Fall, Spring, 2009; 2010

Professors: Leda Minkova, Marusia Bozhkova

Led the exercise section of the Theory of Probability (for Math/Stat majors), Probability and Statistics (for CS majors) courses. Taught in class, proposed problems for examinations and graded the students.

STUDENT
SUPERVISION

Current and Former Graduate Students

Northwestern University

- Shuo (Tansio) Han (masters student)
- Guanghong Yi (masters student)
- Xiaolong Liu (masters student)
- Robert Peng (committee member)
- Kayla Schroeder (committee member)

- Zewei Li (committee member)
- Yikun Li (PhD student)
- Tuorui Peng (PhD student)
- Wenshuo Liu (PhD student)

Carnegie Mellon University

- Askhay Prasad (primary thesis advisor)
- Yufei Yi (primary thesis advisor)
- Shamindra Shrotriya (primary thesis advisor)
- Raghav Bansal (ADA project)
- Michael Li (undergraduate student)

PRESENTATIONS

Invited Talks

“Information theoretic limits of robust sub-Gaussian mean estimation under star-shaped constraints”

- AHIDI workshop, University of Verona, Nov 2024
- CFE-CMStatistics, King’s College London, Dec 2024 (virtual)

“Some Insights in Nonparametric Conditional Independence Testing”

- Northwestern University, Sept 2024
- Purdue University, March 2024
- University of Chicago Booth School of Business, Oct 2023
- École Polytechnique, Crest/ENSAE (virtual), Sept 2023

“Isotonic Regression Meets LASSO”

- CMStatistics, Virtual Conference, Dec 2020

“High Temperature Structure Detection in Ferromagnets”

- DSSV, Virtual Conference, Jul 2020
- SDSS, Virtual Conference, Jun 2020

“Minimax optimal conditional independence testing”

- University of Pittsburgh, Feb 2020
- University of Florida, Nov 2019

“Property testing in high dimensional Ising models”

- Workshop on Graphical Models, Columbia University, Oct 2019
- University of Geneva, Nov 2018

“High Dimensions, Inference and Combinatorics. A Journey Through the Data Jungle”

- Rutgers University, Feb 2017
- Cornell University, Feb 2017
- University of Wisconsin, Madison, Feb 2017
- Carnegie Mellon University, Feb 2017
- University of Maryland, College Park, Jan 2017

- Rice University, Jan 2017
- EPFL, Jan 2017, Lausanne Switzerland
- McGill University, Jan 2017, Montreal QC
- UIUC, Jan 2017
- Florida State University, Jan 2017

“Agnostic estimation for misspecified phase retrieval models”

- IMS 18th Meeting of New Researchers in Statistics and Probability, University of Wisconsin-Madison, Jul 2016

“On the characterization of a class of Fisher-consistent loss functions and its application to boosting for hierarchical outcomes”,

- Harvard University, Oct 2013

Contributed Talks & Posters

“Agnostic estimation for misspecified phase retrieval models”

- NeurIPS, Barcelona, Spain, Dec 2016
- Cornell Day of Statistics, Cornell University, Sep 2016

“Structure testing for sparse high dimensional graphical models: lower bounds and algorithms”,

- JSM, Chicago Il, Aug 2016

“A unified theory of confidence regions and testing for high dimensional estimating equations”,

- ICORS, Geneva Switzerland, Jul 2016
- ENAR, Austin TX, Mar 2016

“ L_1 -regularized least squares for support recovery of high-dimensional single index models with Gaussian designs”,

- IOS, Princeton NJ, Mar 2016

“SVM with bootstrap for soft clustering of populations”,

- ENAR, Baltimore MD, Mar 2014

“On the characterization of a class of Fisher-consistent loss functions and its application to boosting for hierarchical outcomes”,

- JSM, Montreal Canada, Aug 2013
- NESS, Storrs CT, April 2013

“Kernel machine based testing procedure for assessing the overall effect of multiple markers on the risk of developing a clinical disease”,

- Harvard University, Aug 2011

GRANTS EXPERIENCE

- NSF DMS-2113684, \$250,000 (co-PI with S.Balakrishnan and L. Wasserman) (active July 2021 – July 2024)

SYNERGISTIC ACTIVITIES

Department Service

Director of Graduate Studies, Department of Statistics and Data Science, Northwestern University, 2024 -

Editorial Boards

Associate Editor, Electronic Journal of Statistics, 2025 -
Associate Editor, Journal of the American Statistical Association, 2026 -

Memberships

Institute of Mathematical Statistics, American Statistical Association

Referee Service

The Annals of Statistics; Journal of the American Statistical Association; Journal of the Royal Statistical Society Series B; Biometrika; Electronic Journal of Statistics; Statistical Science; Mathematical Reviews; Journal of Machine Learning Research; Machine Learning Journal; IEEE Journal on Selected Areas of Information Theory; Annales de l'Institut Henri Poincaré (B) Probabilités et Statistique; Bernoulli; NIPS 2016, 2017, 2018; COLT 2018, 2019;

Session Chair

High-dimensional statistics, IMS Contributed Papers, JSM 2016

Scientific Committee

DSSV 2026

PROFESSIONAL EXPERIENCE

Multimedia Solutions

Sofia Bulgaria

Researcher and Software Developer (part-time, internship)

2007 – 2009

Improved significantly the performance of OpenCV's implementation of Viola Jones' algorithm for face detection with on arm processors; Worked on projects for Bayesian networks, continuous autofocus, image stitching and stabilizing images for CMOS sensors using homotopy and ransac algorithm.

LANGUAGES

Bulgarian – native; English – fluent; Russian – limited working proficiency.

COMPUTER SKILLS

- Statistical Packages: R, SPSS, experience with SAS
- Languages: C/C++, Java, MATLAB, Python, Ruby
- Applications: Ruby on Rails, L^AT_EX
- Operating Systems: Linux, Mac OS, Windows