

Matey N. Neykov, Ph.D.

Baker Hall 232B, Pittsburgh PA 15213,
(412) 268-1493
mneykov@stat.cmu.edu

CURRENT POSITION	Assistant Professor, Department of Statistics & Data Science Carnegie Mellon University	Pittsburgh PA 2017 –
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	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 HUSEC graduate student fellowship, 2011 & 2012	Cambridge MA
	Sofia University 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 Bulgaria
	Sofia High School of Mathematics 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)	Sofia Bulgaria

Balkan Mathematics Olympiad, 2004 (Silver Medal)
International Mathematics Olympiad Tyimaada, 2003 (Silver Medal)
Junior Balkan Mathematics Olympiad, 2001 (Silver Medal)

PAPERS &
PUBLICATIONS

M. Neykov, J. Lu and H. Liu, “Combinatorial inference for graphical models”, *The Annals of Statistics* (to appear) 2017+, *arXiv preprint, arXiv:1608.03045*

M. Neykov, Z. Wang and H. Liu, “Agnostic estimation for misspecified phase retrieval models”, (short version) to appear in *Advances in Neural Information Processing Systems (NIPS)*, 2016

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

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

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

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

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

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

M. Neykov and H. Liu, “Property testing in high dimensional Ising models”, *arXiv preprint, arXiv:1709.06688*, 2017

J. Lu, **M. Neykov** and H. Liu, “Adaptive inferential method for monotone graph invariants”, *arXiv preprint, arXiv:1707.09114*, 2017

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*, 2016

M. Neykov, Y. Ning, J. S. Liu and H. Liu, “A unified theory of confidence regions and testing for high dimensional estimating equations”, *arXiv preprint, arXiv:1510.08986*, 2015

Z. Yang, L. F. Yang, E. X. Fang, T. Zhao, Z. Wang, **M. Neykov**, “Misspecified Nonconvex Statistical Optimization for Phase Retrieval”, 2017

In Preparation

Y. Zhang, **M. Neykov**, T. Cai “Prior Adaptive Semi-supervised Learning with Application to EHR Phenotyping”, 2017

SOFTWARE R package `kernscr`; 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 **Carnegie Mellon University** Pittsburgh PA
Instructor: Statistical Graphics and Visualization, 36-315, Fall 2017

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.

Invited Talks

TBA, Research Center for Statistics, University of Geneva, May 2018, Geneva Switzerland
TBA, CMStatistics, Dec 2017, London UK

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

Department of Statistics and Biostatistics, Rutgers University, Feb 2017, New Brunswick NJ
Department of Statistical Science, Cornell University, Feb 2017, Ithaca NY
Department of Biostatistics and Med. Informatics, Feb 2017, University of Wisconsin, Madison WI
Department of Statistics, Carnegie Mellon University, Feb 2017, Pittsburgh PA
Department of Mathematics, University of Maryland, Jan 2017, College Park MD
Department of Statistics, Rice University, Jan 2017, Houston TX
Department of Mathematics, EPFL, Jan 2017, Lausanne Switzerland
Department of Epidemiology, Biostatistics & Occupational Health, McGill University, Jan 2017, Montreal QC
Department of Statistics, University of Illinois, Jan 2017, Urbana-Champaign IL
Department of Statistics, Florida State University, Jan 2017, Tallahassee FL

“Agnostic estimation for misspecified phase retrieval models”, July 2016, IMS 18th Meeting of New Researchers in Statistics and Probability, University of Wisconsin, Madison WI

“On the characterization of a class of Fisher-consistent loss functions and its application to boosting for hierarchical outcomes”, Oct 2013, Big Data Seminar, Department of Biostatistics, Harvard University

Contributed Talks & Posters

“Agnostic estimation for misspecified phase retrieval models”, Dec 2016, NIPS, Barcelona, Spain

“Agnostic estimation for misspecified phase retrieval models”, Sept 2016, Cornell Day of Statistics, Cornell University, Ithaca NY

“Structure testing for sparse high dimensional graphical models: lower bounds and algorithms”, August 2016, JSM, Chicago IL

“A unified theory of confidence regions and testing for high dimensional estimating equations”, July 2016, ICORS, Geneva Switzerland

“ L_1 -regularized least squares for support recovery of high-dimensional single index models with Gaussian designs”, March 2016, IOS, Princeton NJ

“A unified theory of confidence regions and testing for high dimensional estimating equations”, March 2016, ENAR, Austin TX

“SVM with bootstrap for soft clustering of populations”, March 2014, ENAR, Baltimore MD

“On the characterization of a class of Fisher-consistent loss functions and its application to boosting for hierarchical outcomes”, Aug 2013, JSM, Montreal Canada

“On the characterization of a class of Fisher-consistent loss functions and its application to boosting for hierarchical Outcomes”, April 2013, NESS, Storrs CT

“Kernel machine based testing procedure for assessing the overall effect of multiple markers on the risk of developing a clinical disease”, Aug 2011, Department of Biostatistics, Harvard University

SELECTED CLASSES Machine Learning, Statistical Learning Theory, Multivariate Statistical Analysis, Random Matrix Theory, Brownian Motion, Advanced Statistical Inference, Probability Theory, Functional Analysis, Linear/Non-Linear Convex Optimization

PROFESSIONAL AFFILIATIONS **Memberships**
Institute of Mathematical Statistics, American Statistical Association

Reviewer
Journal of the American Statistical Association, The Annals of Statistics, Journal of the Royal Statistical Society Series B, NIPS

Session Chair
High-dimensional statistics, IMS Contributed Papers, JSM 2016

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