

Barnabás Póczos, Ph.D.

Associate Professor
Born in Miskolc, Hungary
Citizenship: Hungarian

CONTACT INFORMATION

Carnegie Mellon University
School of Computer Science
Machine Learning Department
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Pittsburgh, PA, USA, 15213

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RESEARCH INTERESTS

Theory:

machine learning, artificial intelligence, nonparametric statistics, information theory, statistical data mining, signal processing, graphical models, Bayesian methods, scalability, complex datasets, nonconvex optimization

Applications:

bioinformatics, data mining in medical data, neurobiological modeling, machine learning applications in cancer research, astronomy, cosmology, chemistry, particle physics, material science, additive manufacturing, speech processing, image processing, computer vision, question answering, and robotics

EMPLOYMENT

Associate Professor Machine Learning Department School of Computer Science Carnegie Mellon University Pittsburgh, PA, USA	2018 –
Assistant Professor Machine Learning Department School of Computer Science Carnegie Mellon University Pittsburgh, PA, USA	2012 – 2018
Postdoctoral Fellow Auton Lab, Robotics Institute School of Computer Science Carnegie Mellon University Pittsburgh, PA, USA Supervisor: Prof. Jeff Schneider	2010 – 2012
Postdoctoral Fellow Alberta Ingenuity Center for Machine Learning (AICML) Reinforcement Learning and Artificial Intelligence research group (RLAI) Department of Computing Science	2007 – 2010

University of Alberta
Edmonton, AB, Canada
Supervisor: Prof. Csaba Szepesvári

Assistant Professor 2005 – 2007
Department of Information Systems
Eötvös Loránd University, Budapest, Hungary

Lecturer/Predoctorial Appointment Researcher 2004 – 2005
Department of Information Systems
Eötvös Loránd University
Budapest, Hungary

EDUCATION

Eötvös Loránd University, Budapest, Hungary

Ph.D., Computer Science (*summa cum laude*) 2001 – 2007
specialization in Artificial Intelligence, Machine Learning, and
Neurobiological modeling
Thesis title: Independent Subspace Analysis, 2007
Supervisor: Prof. András Lőrincz

M.Sc., Applied Mathematics (*summa cum laude*) 1996 – 2001
Specialization in Statistics, Probability Theory, Operation Research,
Artificial Intelligence, Machine Learning, Financial and Actuarial Mathematics
Thesis title: The problems of representation and interpretation in neural systems
Supervisor: Prof. András Lőrincz

AWARDS

IJCAI-2015 Distinguished Paper Award. 2015
Kirthivasan Kandasamy, Jeff Schneider, and Barnabás Póczos: Bayesian Active Learning for Posterior
Estimation. 24th International Joint Conference on Artificial Intelligence, 2015, Buenos Aires, Argentina.
(Out of 1,996 paper submissions with 575 accepted papers, this was one of two papers to receive the award).

Yahoo! ACE (Academic Career Enhancement) Award (\$10,000) 2012

1st prize, 25th Hungarian National Scientific Student Competition and Conference. 2001
Computer Science Session, Eger, Hungary

1st prize, Scientific Student Competition and Conference of Eötvös Loránd University. 2001
Computer Science Session, Budapest, Hungary

SCHOLARSHIPS

Scholarship of the John von Neumann Computer Society 2002 – 2007
Scholarship of the Bliss Foundation 2004
Scholarship of the Eötvös Loránd University, predoctoral appointment 2004
Scholarship of the Pázmány–Eötvös Foundation 2000

CONTRIBUTIONS TO EDUCATION

Lecturing

Carnegie Mellon University, Pittsburgh, PA
Machine Learning with Large Datasets, (Computer Science 10-405 and 10-605), 2018 Spring
ca. 60 students
Machine Learning with Large Datasets, (Computer Science 10-605 and 10-805), 2018 Fall

ca. 200 students	
<i>Art and Machine Learning (Computer Science 10-615),</i>	2018 Spring
ca. 30 undergraduate students (joint lecturing with Prof. Eunsu Kang)	
<i>Introduction to Machine Learning (Computer Science 10-701),</i>	2017 Fall
ca. 150 graduate students	
<i>Introduction to Machine Learning (Computer Science 10-401),</i>	2017 Spring
ca. 50 undergraduate students	
<i>Advanced Introduction to Machine Learning (Computer Science 10-715),</i>	2016 Fall
ca. 40 graduate students	
<i>Introduction to Machine Learning (Computer Science 10-401),</i>	2016 Spring
ca. 50 undergraduate students (joint lecturing with Prof. Aarti Singh)	
<i>Advanced Introduction to Machine Learning (Computer Science 10-715),</i>	2015 Fall
ca. 35 graduate students (joint lecturing with Prof. Alex Smola)	
<i>Advanced Introduction to Machine Learning (Computer Science 10-715),</i>	2014 Fall
ca. 35 graduate students (joint lecturing with Prof. Eric Xing)	
<i>Introduction to Machine Learning (Computer Science 10-701),</i>	2014 Spring
ca. 140 graduate students (joint lecturing with Prof. Aarti Singh)	
<i>Convex Optimization (Computer Science 10-725),</i>	2013 Fall
ca. 90 graduate students (joint lecturing with Prof. Ryan Tibshirani)	
<i>Introduction to Machine Learning (Computer Science 10-701),</i>	2013 Spring
ca. 120 graduate students (joint lecturing with Prof. Alex Smola)	
University of Alberta, Edmonton, Canada	2009 Fall
<i>Introduction to Machine Learning (CMPUT 466/551)</i>	
26 graduate and 7 undergraduate students	
(joint lecturing with Prof. Russell Greiner)	
Eötvös Loránd University, Budapest, Hungary	(2005 – 2007, Fall and Spring)
<i>Artificial Neural Networks, (ca. 45 students in each semester)</i>	
<i>Artificial Intelligence and its applications, (ca. 25 students in each semester)</i>	
<i>Image Processing, (ca. 25 students in each semester)</i>	
<i>Speech Processing, (ca. 25 students in each semester)</i>	

Curriculum development:

Machine Learning with Large Datasets (Computer Science 10-605, 10-805), (redesigned content)	(2018 Fall)
Machine Learning for Art (Computer Science 10-615, Art 60-411), co-developed with Eunsu Kang	(2018 Spring)
Introduction to Machine Learning (Computer Science 10-401), co-developed with Aarti Singh	(2014 Fall)
Advanced Introduction for Machine Learning (Computer Science 10-715), co-developed with Eric Xing	(2016 Spring)

Teaching materials: exam questions, homework assignments, program codes (matlab, python, and ipython notebooks), lecture slides, lecture notes, and video lectures are available on the class websites.

STUDENT SUPERVISION

Postdoctoral Fellow Supervision

Kirthevasan Kandasamy	2018 -
co-advised with Jeff Schneider	
Robotics Institute, Carnegie Mellon University, Pittsburgh, PA,	
Research topics: i) Bayesian Optimization, ii) Bandits, iii) Design of Experiments	

Siamak Ravanbakhsh 2015 - 2017
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
Research topics: i) Machine Learning Algorithms for Matching Theories, Simulations,
and Observations in Cosmology, ii) Machine Learning on Structured Domains

Ph.D. Supervision (Current)

Chenghui Zhou 2018 -
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,
PhD program entrance year: 2016
Research topics: Reinforcement Learning
Expected graduation: 2021

Han Nguyen 2018 -
Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA,
Research topics: Nonconvex Optimization

Hai Pham 2018 -
Language Technology Institute, CMU, Pittsburgh, PA,
PhD program entrance year: 2018
Research topic: Semisupervised Word and Character Recognition
Expected graduation: 2022

Daniel Clothiaux 2018
Language Technologies Institute, Carnegie Mellon University, Pittsburgh, PA,
(joint supervision with Prof. Ravi Starzl)
PhD program entrance year: 2017
Research topics: Handwritten Forms Recognition
Expected graduation: 2021

Ilqar Ramazanli 2017 -
Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA,
Research topics: Active Matrix Completion

Ananya Uppal 2017 -
Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA,
Research topics: Generative Neural Networks

Biswajit Paria 2017 -
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,
(joint supervision with Prof. Pradeep Ravikumar)
PhD program entrance year: 2017
Research topics: Automated Scientific Discovery
Expected graduation: 2022

Simon Du 2015 -
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,
(joint supervision with Prof. Aarti Singh)
PhD program entrance year: 2015
Research topics: i) Analysing the Convergence Rate of Transfer Learning Methods,
ii) Estimating phenotypes from 3D images of energy crops
(joint project with Prof. David Wettergreen)
Expected graduation: 2020

Otilia Stretcu 2015 -
CMLH Fellowship winner in Digital Health (2018-2019)
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,

(joint supervision with Prof. Tom Mitchell)
PhD program entrance year: 2015
Research topic: Multimodal Data Processing Methods in Neuroimaging Applications
Expected graduation: 2020

Chun-Liang Li 2015 -

Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
IBM Fellowship Winner (2018-2019)
IJCAI 2017, Best student paper runner-up PhD program entrance year: 2014
Research topics: i) Implicit generative models,
ii) Anomaly Detection in Video Streams
Expected graduation: 2020

Shashank S. Singh 2014 -

Department of Statistics, Carnegie Mellon University, Pittsburgh, PA,
Joint PhD Program in Statistics and Machine Learning
PhD program entrance year: 2014
National Science Fellowship Winner (2015 - 2018)
(2017-2018) Richard K. Mellon Foundation Presidential Fellowships in the Life Sciences
Research topics: i) Nonparametric Density Functional Estimation, ii) Deep Learning for
Prediction from Gene Sequence Data (joint project with Prof. Jian Ma)
Expected graduation: 2019

Kirthevasan Kandasamy 2013 -

Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,
(joint supervision with Prof. Jeff Schneider)
Facebook Fellowship Winner (2017-2019)
Siebel Fellowship Winner (2017-2018)
CMU Presidential Fellowship Winner (2015)
PhD program entrance year: 2013
Research topics: High-dimensional Optimization in Multi-fidelity Problems
Expected graduation: 2018

Ph.D. Supervision (Alumni)

Manzil Zaheer 2016 - 2018

Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,
(joint supervision with Prof. Ruslan Salakhutdinov)
PhD program entrance year: 2013
Thesis title: Representation Learning @ Scale
Occupation: Research Scientist at Google, NYC, NY

Junier Oliva 2012 - 2018

Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,
(joint supervision with Prof. Jeff Schneider)
PhD program entrance year: 2012
Thesis title: Distribution and Histogram (DisH) Learning
Occupation: Assistant Professor, University of North Carolina at Chapel Hill, Chapel Hill, NC

Sashank Jakkam Reddi 2012 - 2017

Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,
(joint supervision with Prof. Alex Smola)
PhD program entrance year: 2011
Thesis title: New Optimization Methods for Modern Machine Learning
Occupation: Research Scientist at Google, NYC, NY

M.Sc. Supervision (Current)

- Zheng Jiang 2018 -
Master Program of Music and Technology, CMU, Pittsburgh, PA,
(joint supervision with Prof. Roger Dannenberg)
MSc program entrance year: 2017
Research topic: Computer Based Music Structure Analysis for Symbolic Music Representation
- Emre Yolcu 2017 -
Machine Learning Department, CMU, Pittsburgh, PA,
MSc program entrance year: 2017
Research topic: Automatic Theorem Proving, Question Answering
- Daniel Martin 2017 -
Machine Learning Department, CMU, Pittsburgh, PA,
(joint supervision with Prof. Burton Hollifield)
MSc program entrance year: 2017
Research topic: Machine Learning in Financial Applications
- YuSha Liu 2017 -
Machine Learning Department, CMU, Pittsburgh, PA
MSc program entrance year: 2017
Research topic: Anomaly Detection in Video Streams
- Sanket Mehta 2017 -
Language Technology Institute, CMU, Pittsburgh, PA,
(joint supervision with Prof. Jaime Carbonell)
MSc program entrance year: 2017
Research topic: Demand Forecast Prediction
- Zirui Wang 2017 -
Language Technology Institute, CMU, Pittsburgh, PA,
(joint supervision with Prof. Jaime Carbonell)
MSc program entrance year: 2017
Research topic: Research topic: Demand Forecast Prediction
- Yang Zhang 2017 -
Machine Learning Department, CMU, Pittsburgh, PA
MSc program entrance year: 2017
Research topic: Machine Learning in Manufacturing Applications
- Naji Shajari 2017 -
ML Secondary Masters
Philosophy department, CMU, Pittsburgh, PA
co-advised by Kun Zhang and Peter Spirtes
MSc program entrance year: 2017
Research topic: Exploiting Functional Structures For Learning From Positive and Unlabeled Data

M.Sc. Supervision (Alumni)

- Rulin Chen 2017 - 2018
Department of Physics and Machine Learning Department, CMU, Pittsburgh, PA
MSc program entrance year: 2017
Research topic: Optimization in tomography reconstruction
- Deepak Dilipkumar 2016 - 2017
Machine Learning Department, CMU, Pittsburgh, PA
MSc program entrance year: 2016
Research topic: Handwritten Word Recognition with Deep Learning

- Eric Ma 2016 - 2017
 Machine Learning Department, CMU, Pittsburgh, PA
 MSc program entrance year: 2016
 Research topic: Machine learning approaches for understanding the 'Mapping Nearby Galaxies at Apache Point Observatory' dataset.
- Hai Pham 2016 - 2018
 Language Technology Institute, CMU, Pittsburgh, PA,
 (joint supervision with Prof. Ravi Starzl)
 MSc program entrance year: 2016
 Research topic: Semisupervised Word and Character Recognition
- Michael Muehl 2015 - 2017
 Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA,
 (joint supervision with Prof. David Bourne)
 MSc program entrance year: 2015
 Research topic: Anomaly Detection in Crowd Behavior Using Point-cloud Data
- Jingkun Gao 2015 - 2016
 Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA,
 (joint supervision with Prof. Mario Berges)
 Secondary MSc Program entrance year: 2015
 Thesis title: Point Type Inference in Heating, Ventilation and Air Conditioning Systems
- Shashank S. Singh 2013 - 2014
 Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA
 MSc program entrance year: 2013
 MSc Honors Thesis title: Concentration Inequalities for Density Functionals
- Mohsen Ravanbaksh 2009 - 2010
 Department of Computing Science, University of Alberta, Edmonton, Canada,
 (joint supervision with Prof. Russell Greiner)
 Thesis title: A Stochastic Optimization Method for Partially Decomposable Problems,
 with Application to NMR Spectra, (nominated for the 'Best M.Sc. Thesis' award)

Undergraduate Supervision (Current)

- Shalom Yiblet 2018 -
 Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
 BSc program entrance year: 2015
 SCS Senior Thesis title: Machine Learning Compression Algorithms for Extrapolating
 a Wide Variety of Images
- George Cai 2018 -
 Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
 Co-advised by Chun-Liang Li
 BSc program entrance year: 2015
 SCS Senior Thesis title: Understanding Lipschitzity in Generative Adversarial Network
- George Stoica 2018 -
 Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
 BSc program entrance year: 2015
 SCS Senior Thesis title: Link-Prediction with Types

Undergraduate Supervision (Alumni)

- Jit Nandi 2013 - 2015
 Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA

BSc program entrance year: 2013

BSc Honors Thesis title: Distinguishing between different mechanisms of network evolution using network motifs and machine learning

Thesis Committees

Kwangho Kim (Ph.D.) Statistics Department, Carnegie Mellon University, Pittsburgh, PA (Committee member for Thesis proposal) Thesis title: TBA	2018
Zheng Jiang (MS) Master Program of Music Technology, Carnegie Mellon University, Pittsburgh, PA (Committee member for Thesis proposal) Thesis title: Computer Based Music Structure Analysis for Symbolic Music Representation	2018
Han Zhao (Ph.D.) Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA (Committee member for Thesis proposal) Thesis title: TBA	2018
Keerthiram Murugesan (Ph.D.) Language Technologies Institute, Carnegie Mellon University, Pittsburgh, PA (Committee member for Thesis defense) (Committee member for Thesis proposal) Thesis title: Online and Adaptive Methods for Multitask Learning	2018 2017
Shashank S. Singh (M.Sc.) Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA (Committee head for PhD Thesis proposal) Thesis proposal title: Estimating Probability Distributions and Their Properties Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA (Committee head for MSc Thesis defense) Thesis proposal title: Concentration Inequalities for Density Functionals	2018 2014
Christoph Dann (Ph.D.) Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA (Committee member for Thesis proposal) Thesis title: TBA	2018
Brandon Amos (Ph.D.) Computer Science Department, Carnegie Mellon University, Pittsburgh, PA (Committee member for Thesis proposal) Thesis title: Differential Optimization-Based Inference for Machine Learning	2018
George Philipp (Ph.D.) Computer Science Department, Carnegie Mellon University, Pittsburgh, PA (Committee member for Thesis proposal) Thesis title: TBA	2018
Jesse Dodge (Ph.D.) Language Technologies Institute, Carnegie Mellon University, Pittsburgh, PA (Committee member for Thesis proposal) Thesis title: Modeling Diversity in the Machine Learning Pipeline	2018
Manzil Zaheer (Ph.D.) Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA (Committee co-head for Thesis defense) (Committee co-head for Thesis proposal)	2018 2018

Thesis title: Representation Learning @ Scale

Simon Du (Ph.D) 2018
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
(Committee co-head for Thesis proposal)
Thesis title: Understanding Gradient Descent for Non-convex Problems

Junier Oliva (Ph.D) 2018
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
(Committee co-head for Thesis defense)
(Committee co-head for Thesis proposal) 2017
Thesis title: Distribution and Histogram (DisH) Learning

Ian E.H. Yen (Ph.D) 2018
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
(Committee member for Thesis defense)
(Committee member for Thesis proposal) 2017
Thesis title: Sublinear-Time Optimization for High-Dimensional Learning

Avinava Dubey (Ph.D) 2017
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
(Committee member for Thesis proposal)
Thesis title: Scalable Bayesian Nonparametrics

Michelle Ntampaka (Ph.D) 2017
Department of Physics, Carnegie Mellon University, Pittsburgh, PA
(Committee member for Thesis defense) 2017
(Committee member for Annual review) 2014
Thesis title: Cosmology with Galaxy Cluster Dynamics Using Machine Learning
and Forward Modeling

Jingkun Gao (Ph.D) 2017
Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA,
(Committee member for Thesis defense) 2017
Thesis title: A Metadata Inference Framework to Provide Operational Information Support
for Fault Detection and Diagnosis Applications in Secondary HVAC Systems
(Committee member for Thesis proposal) 2016
Thesis proposal title: A Point Identification Framework to Provide Operational
Information Support for Fault Detection and Diagnosis Applications in
Secondary HVAC Systems

Kirstin Early (Ph.D) 2017
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
(Committee member for Thesis defense)
Thesis title: Dynamic Question Ordering: Obtaining Useful Information While Reducing
User Burden

Sashank Jakkam Reddi (Ph.D) 2017
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
(Committee co-head for Thesis defense) 2017
(Committee co-head for Thesis proposal) 2016
Thesis title: New Optimization Methods for Modern Machine Learning

Michael Spece (Ph.D) 2017
Machine Learning Department, Carnegie Mellon University, Pittsburgh, PA
Stat/ML Joint PhD program
(Committee member for Thesis proposal)

Thesis proposal title: Structural Learning of Data Regularity and Ensemble Size	
Mu Li (Ph.D)	2017
Computer Science Department, Carnegie Mellon University, Pittsburgh, PA	
(Committee member for Thesis defense)	2017
(Committee member for Thesis proposal)	2016
Thesis proposal title: Scaling Distributed Machine Learning with System and Algorithm Co-design	
Irem Velibeyoglu (Ph.D)	2016
Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA,	
(Committee member for Qualifying exam)	
Dougal Sutherland (Ph.D)	
Computer Science Department, Carnegie Mellon University, Pittsburgh, PA	
(Committee member for Thesis defense)	2016
(Committee member for Thesis proposal)	2015
Thesis proposal title: Scalable, Flexible, and Active Learning on Distributions	
In-Soo Jung (Ph.D.)	
Carnegie Mellon University, Pittsburgh, PA	
Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA,	
(Committee member for Thesis defense)	2015
(Committee member for Thesis proposal)	2013
Thesis proposal title: Anomaly Detection of Piezometer Data Collected from Embankment Dams	
Mohsen Ravanbaksh (M.Sc.),	2009
Department of Computing Science, University of Alberta, Edmonton, Canada,	
(joint supervision with Prof. Russell Greiner)	
Thesis title: A Stochastic Optimization Method for Partially Decomposable Problems, with Application to NMR Spectra	
Levente Török (Ph.D.)	2007
Eötvös Loránd University, Budapest, Hungary.	
(Thesis reviewer)	

Data Analysis Project (DAP) Committees

Rulin Chen, Department of Physics and MLD, Carnegie Mellon University, Pittsburgh, PA	2018
Hongyu Zhu, Department of Physics, Carnegie Mellon University, Pittsburgh, PA	2018
Simon Du, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Otilia Stretcu, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Igor Gitman, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Rui Peng, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Eric Ma, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Deepak Dilipkumar, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Chun-Liang Li, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Vivek Nangia, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Mu-Chu Lee, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Eric Lei, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Michael Muehl, MLD, Carnegie Mellon University, Pittsburgh, PA	2017
Manzil Zaheer, MLD, Carnegie Mellon University, Pittsburgh, PA	2016
Kirthevasan Kandasamy, MLD, Carnegie Mellon University, Pittsburgh, PA	2016
Tianshu Ren, MLD, Carnegie Mellon University, Pittsburgh, PA	2016
Junier Oliva, MLD, Carnegie Mellon University, Pittsburgh, PA	2016
Jingkun Gao, MLD, Carnegie Mellon University, Pittsburgh, PA	2016
Sashank Jakkam Reddi, MLD, Carnegie Mellon University, Pittsburgh, PA	2015

Advanced Data Analysis (ADA) Committees

Shashank S. Singh, Dept. of Statistics, Carnegie Mellon University, Pittsburgh, PA	2015
Yotam Hechtlinger, Dept. of Statistics, Carnegie Mellon University, Pittsburgh, PA	2015

Mentoring

Liang Xiong, Ph.D., Machine Learning Department, Carnegie Mellon University	2010 - 2012
Liuyang Li, M.Sc., Dept. of Computing Science, University of Alberta	2010
Zoltán Szabó, M.Sc., Ph.D., Faculty of Informatics, Eötvös Loránd University	2005 - 2007
Nikolett Bakos, M.Sc., Faculty of Informatics, Eötvös Loránd University	2006

PROFESSIONAL ACTIVITIES

Reviewing for Scientific Journals

Journal of Machine Learning Research (JMLR)
Machine Learning Journal (MLJ)
Foundations and Trends in Machine Learning
IEEE's Transactions on Information Theory (IEEE IT)
IEEE's Transactions on Pattern Analysis and Machine Intelligence (IEEE TPAMI)
IEEE's Transactions on Knowledge and Data Engineering (IEEE TKDE)
IEEE's Transactions on Signal Processing (IEEE TSP)
IEEE's Transactions on Neural Networks (IEEE TNN)
Scandinavian Journal of Statistics
ESAIM Probability and Statistics (P&S)
Artificial Intelligence (AI)
Annals of Mathematics and Artificial Intelligence (AMAI)
Neurocomputing (NEUCOM)
Digital Signal Processing (DSP)
Neural Computing and Applications (NCA)
Progress in Artificial Intelligence (PRAI)
The European Physical Journal B (EPJ B)
Journal of Chemometrics (J CHEMOMETR)

Reviewing for Conferences

International Conference on Machine Learning (ICML)
Advances in Neural Information Processing Systems (NIPS)
Conference on Learning Theory (COLT)
AI & Statistics (AISTATS)
Association for the Advancement of Artificial Intelligence (AAAI)
European Conference on Machine Learning (ECML)
International Conference on Learning Representations (ICLR)
AI & Math Symposium (ISAIM)
European Signal Processing Conference (EUSIPCO)
International Joint Conference on Artificial Intelligence (IJCAI)
International Joint Conference on Neural Networks (IJCNN)
European Conference on Complex Systems (ECCS)
International Conference on Latent Variable Analysis and Signal Separation (LVA/ICA)
NIPS2011, Workshop on Bayesian Optimization, Experimental Design and Bandits
Hungarian National Scientific Student Competition and Conference (2005)

Senior Program Committee Member

International Conference on Machine Learning (senior area chair) (ICML-2019)
International Conference on Machine Learning (area chair) (ICML-2018)
AI & Statistics (publications chair) (AISTATS-2017)

AI & Statistics (AISTATS-2018, 2019)
Neural Information Processing Systems (area chair) (NIPS-2015, 2017)
International Joint Conference on Artificial Intelligence (2011, 2015, 2016)

Reviewing Grant Applications

National Science Foundation (NSF)
Natural Sciences and Engineering Research Council of Canada (NSERC)
European Research Council (ERC)
Department of Energy (DOE)

Conference Organization

Machine Learning in Science and Engineering (MLSE), 2018, Organizer
CMU Symposium on Machine Learning in Science and Engineering, 2017, Organizer
International Conference on Machine Learning (ICML) 2016, Session chair
AI and Statistics (AISTATS) 2011, 2017, 2018, Session chair
European Signal Processing Conference (EUSIPCO) 2011, Session chair
Hungarian National Scientific Student Competition and Conference 2005, Organizer

University Services

Co-Director of the PhD Program, Machine Learning Dept., Carnegie Mellon U.,	2018 –
Head of PhD Students Admission Committee, Machine Learning Dept., Carnegie Mellon U.,	2017
Education Review Committee member, Machine Learning Dept., Carnegie Mellon U.,	2018 –
Speaking Skills Committee, Machine Learning Dept., Carnegie Mellon U.,	2017 –
Head of MSc Students Admission Committee, Machine Learning Dept., Carnegie Mellon U.,	2016
Organizing the ML Seminar series, Machine Learning Dept., Carnegie Mellon U.,	2016 –
Faculty Search Committee member, Physics Department, Carnegie Mellon U.,	2015
Dowd Fellowship Proposal Reviewer, College of Engineering, Carnegie Mellon U.,	2016
Faculty Search Committee member, Machine Learning Department, Carnegie Mellon U.,	2014
Judge for the regional Siemens High School Science Talent competition, Pittsburgh, PA	2013
Organizing and chairing the Reinforcement Learning and Artificial Intelligence (RLAI) weekly group meetings at the University of Alberta, Department of Computing Science	2010
Secretary for the Hungarian National Scientific Student Competition and Conference at the Eötvös Loránd University, Department of Information Systems	2005 – 2007

SKILLS

Languages: English (fluent), German (basic), Hungarian (native)
Computer languages: Matlab, Maple, C++, C#, Java, Python, Javascript, Html, \LaTeX
Other skills: Certified soccer referee

GUEST LECTURES

- 10-703: Deep Reinforcement Learning and Control** 2018
Topic: Planning in Scientific Experiments
Lecturers: Katerina Fragkiadaki and Tom Mitchell
- 10-601: Introduction to Machine Learning** 2017
Topic: Reinforcement Learning
Lecturer: Matt Gromley

INVITED TALKS

- 1. Machine Learning for Experiment Design**
Deep Learning for Multi-messenger Astrophysics: Real-Time Discovery at Scale
Short talk + 90 minutes panel discussion
University of Illinois at Urbana–Champaign
Champaign, IL, 2018.
- 2. Trends in Machine Learning**
US ATLAS Summer workshop, (30 minutes)
Pittsburgh, PA, 2018.
- 3. Machine Learning methods for Cosmology**
Time Domain Cosmology Workshop, Pittsburgh, (50 minutes)
Pittsburgh, PA, 2018.
- 4. Machine Learning for Experiment Design**
Machine Learning in Science and Engineering, Pittsburgh, (30 minutes)
Pittsburgh, PA, 2018.
- 5. Distribution Regression and its Applications**
Google, Pittsburgh, (50 minutes)
Pittsburgh, PA, 2018.
- 6. Density Functional Estimation and Distribution Regression**
Wilks Statistics Seminar, Princeton University, (60 minutes)
Princeton, NJ, 2018.
- 7. Distribution Regression**
NIPS workshop on Learning on Distributions, Functions, Graphs and Groups
Long Beach, CA, 2017.
- 8. Automated Scientific Discovery**
Lawrence Berkeley National Laboratory, (60 minutes)
Berkeley, CA, 2017.
- 9. Density Functional Estimation**
55th Annual Allerton Conference on Communication, Control, and Computing
Density Estimation and Property Testing, Invited session
Urbana, IL, 2017.
- 10. Density Functional Estimation and its Applications**
Mind Research Network, (60 minutes)
Albuquerque, NM, 2017.
- 11. Density Functional Estimation**
École polytechnique, Université Paris-Saclay (60 minutes)
Palaiseau, France, 2017.
- 12. Stochastic Variance Reduction for Nonconvex Optimization**
École polytechnique, Université Paris-Saclay, (60 minutes)
Palaiseau, France, 2017.
- 13. Artificial Intelligence: A New Hope?**
Földes Ferenc High School, (50 minutes)
Miskolc, Hungary, 2016.

14. **Applied Machine Learning for Design Optimization in Cosmology, Neuroscience, and Drug Discovery**
Machine Learning Technologies and Their Applications to Scientific and Engineering Domains Workshop.
NASA Langley Research Center, (30 minutes)
Hampton, VA, 2016.
15. **Machine Learning for Cosmology 101**
Innovative Cosmological Simulations with Machine Learning and Statistics in the era of LSST Workshop.
Carnegie Mellon University, (45 minutes)
Pittsburgh, PA, 2015.
16. **Machine Learning on Functional Data**
Gatsby Unit, University College London, (1 hour)
London, UK, 2015.
17. **Machine Learning on Distributions**
NIPS 2012 Workshop on Modern Nonparametric Methods in Machine Learning, (1 hour)
Lake Tahoe, Nevada, 2012.
18. **Support Distribution Machines and Copula-based Kernel Dependency Measures**
University of Alberta, Department of Computing Science, AI Seminar, (1 hour)
Edmonton, Canada, 2012.
19. **Dependence estimation in high-dimensional Euclidean spaces**
Carnegie Mellon University, Department of Statistics, Statistics Seminar, (1 hour)
Pittsburgh, PA, USA, 2012.
20. **Learning with nonparametric dependence and divergence estimation**
University of Cambridge, Department of Engineering, (1 hour)
Cambridge, UK, 2012.
21. **Learning with nonparametric dependence and divergence estimation**
Carnegie Mellon University, School of Computer Science, (1 hour)
Pittsburgh, PA, USA, 2012.
22. **Machine learning to recognize phenomena in large scale simulations**
SIAM Conference on Uncertainty Quantification, (25 minutes)
Raleigh, North Carolina, 2012.
23. **Support distribution machines**
Carnegie Mellon University, School of Computer Science, (1 hour)
Machine Learning Lunch Seminar,
Pittsburgh, PA, USA, 2012.
24. **Information and divergence estimation in machine learning**
University of Sheffield, Sheffield Institute for Translational Neuroscience, (1 hour)
Sheffield, UK, 2011.
25. **Nonparametric estimation in machine learning**
Johns Hopkins University, Department of Physics and Astronomy, (20 mins)
Baltimore, MD, 2011.
26. **Nonparametric estimation in machine learning**
University of Sheffield, Department of Computer Science, (25 mins)
Sheffield, UK, 2011.
27. **Nonparametric estimation of probabilistic divergences**
Purdue University, Department of Statistics, Machine Learning colloquium, (1 hour)
West Lafayette, IN, USA, 2011.

28. **Nonparametric estimation of divergences and its applications in machine learning**
University of Alberta, Department of Computing Science, AI Seminar, (1 hour)
Edmonton, Canada, 2010.
29. **Rank based Euclidean graph optimization methods for information estimation**
University of Alberta, Department of Mathematical and Statistical Sciences,
Statistics Seminar, (1 hour)
Edmonton, Canada, 2010.
30. **Nonparametric information estimation using rank based Euclidean graph optimization methods**
Carnegie Mellon University, School of Computer Science,
Machine Learning Lunch Seminar, (45 minutes)
Pittsburgh, PA, USA, 2010.
31. **Rank based Euclidean graph optimization methods for information estimation**
University of Alberta, Department of Computing Science, AI Seminar, (1 hour)
Edmonton, Canada, 2010.
32. **Dependence and mutual information estimation**
Eötvös Loránd University, (4 hours)
Budapest, Hungary, 2009.
33. **Nonparametric copula methods for mutual information estimation and independent component analysis**
University of Alberta, Department of Computing Science, AI Seminar, (1 hour)
Edmonton, Canada, 2008.
34. **Independent subspace analysis**
Max Planck Institute for Biological Cybernetics, (45 minutes)
Tübingen, Germany, 2007.
35. **Independent subspace analysis**
University of Alberta, Department of Computing Science, AI Seminar, (1 hour)
Edmonton, Canada, 2007.
36. **Independent subspace analysis**
Radboud University Nijmegen, (1 hour)
Nijmegen, Netherlands, 2007.
37. **Independent subspace analysis**
IDSIA, Dalle Molle Institute for Artificial Intelligence, (45 minutes)
Lugano, Switzerland, 2007.
38. **New possibilities in the human–computer communications**
Budapest University of Technology and Economics, Applied mathematics seminar, (1 hour)
Budapest, Hungary, 2003.
39. **New ways in the human–computer interactions**
Eötvös Loránd University, The day of Applied mathematics, (30 minutes)
Budapest, Hungary, 2003.

OTHER TALKS, POSTER PRESENTATIONS

1. Z. Szabó, B. Póczos, and A. Lőrincz:,
Collaborative Filtering via Group-Structured Dictionary Learning,
Eötvös Loránd University, Faculty of Informatics, Innovation Day, Budapest, Hungary, 2012.
2. Z. Szabó, B. Póczos, and A. Lőrincz:,
Online group-structured dictionary learning,
Eötvös Loránd University, Faculty of Informatics, von Neumann's Day, Budapest, Hungary, 2011.

3. Z. Szabó, B. Póczos, and A. Lőrincz,
Online group-structured dictionary learning,
Eötvös Loránd University, TÁMOP Research Seminar, Budapest, Hungary, 2011.
4. Z. Szabó, B. Póczos, and A. Lőrincz,
Online group-structured dictionary learning,
Machine Learning at Budapest, Budapest, Hungary, 2011.
5. Z. Szabó, B. Póczos, and A. Lőrincz,
Online structured dictionary learning and its applications,
Eötvös Loránd University, Problem Solving Seminar for Applied Mathematicians, Budapest, Hungary, 2011.
6. Z. Szabó, B. Póczos, and A. Lőrincz,
Exploration of behavioral patterns and its applications in Human-Computer interaction,
Info Savaria, Szombathely, Hungary, 2005.
7. Z. Szabó, B. Póczos, and A. Lőrincz,
Recognition of behavioral patterns and its potentials of human-computer interaction,
Info ÉRA, Békéscsaba, Hungary, 2005.
8. Gy. Hévízi, M. Biczó, B. Póczos, Z. Szabó, B. Takács, and A. Lőrincz,
Adaptive human-computer interaction via face and gaze tracking,
Eötvös Loránd University, Faculty of Informatics, von Neumann's Day, Budapest, Hungary, 2003.

PUBLICATIONS

Citations are available at:

<https://scholar.google.com/citations?user=sUriZlUAAAAJ&hl=en>

REFEREED JOURNAL PAPERS—PUBLISHED

- [1] S. Singh, Y. Yang, B. Póczos, and J. Ma.
Predicting Enhancer-Promoter Interaction from Genomic Sequence with Deep Learning.
Quantitative Biology, 2018.
- [2] F. Lanusse, Q. Ma, N. Li, T. Collett, C. Li, S. Ravanbakhsh, R. Mandelbaum, and B. Póczos.
CMU DeepLens: Deep Learning For Automatic Image-based Galaxy-Galaxy Strong Lens Finding.
Monthly Notices of the Royal Astronomical Society Main Journal (MNRAS), 2017.
- [3] A. Menon, C. Gupta, K. Perkins, B. DeCost, N. Budwal, R. Rios, K. Zhang, B. Póczos, and N. Washburn.
Elucidating Multi-Physics Interactions in Suspensions for the Design of Polymeric Dispersants: A Hierarchical Machine Learning Approach.
Molecular Systems Design & Engineering. Published by the Royal Society of Chemistry, 2017.
- [4] K. Kandasamy, J. Schneider, and B. Póczos.
Query Efficient Posterior Estimation in Scientific Experiments via Bayesian Active Learning.
Artificial Intelligence Journal, 2016.
- [5] F. Yeh, J. Vettel, A. Singh, B. Póczos, S. Grafton, K. Erickson, W. Tseng, and T. Verstynen.
Quantifying Differences and Similarities in Whole-Brain White Matter Architecture Using Local Connectome Fingerprints.
PLOS Computational Biology, 2016.
- [6] Z. Szabó, B. Sriperumbudur, B. Póczos, and A. Gretton.
Learning Theory for Distribution Regression.
Journal of Machine Learning Research (JMLR), 2016.

- [7] M. Ntampaka, H. Trac, D. Sutherland, S. Fromenteau, B. Póczos, and J. Schneider.
Dynamical Mass Measurements of Contaminated Galaxy Clusters Using Machine Learning.
The Astrophysical Journal, 2016.
- [8] I. Jung, M. Berges, J. Garrett, and B. Póczos.
Exploration and Evaluation of AR, MPCA and KL Anomaly Detection Techniques to Embankment Dam Piezometer Data.
Advanced Engineering Informatics, 2015.
- [9] M. Ntampaka, H. Trac, D. Sutherland, N. Battaglia, B. Póczos, and J. Schneider.
A Machine Learning Approach for Dynamical Mass Measurements of Galaxy Clusters.
The Astrophysical Journal, 2015.
- [10] X. Xu, S. Ho, H. Trac, J. Schneider, B. Póczos, and M. Ntampaka.
A First Look at Creating Mock Catalogs with Machine Learning Techniques.
The Astrophysical Journal, 2013.
- [11] Z. Szabó, B. Póczos, and A. Lőrincz.
Separation Theorem for Independent Subspace Analysis and its Consequences.
Pattern Recognition (PR), 45(4):1782–1791, 2012. doi:10.1016/j.patcog.2011.09.007
(Impact factor: 2.607).
- [12] Z. Szabó, B. Póczos, and A. Lőrincz.
Auto-regressive Independent Process Analysis without Combinatorial Efforts .
Pattern Analysis and Applications (PAA) , 13:1–13, 2010.
(Impact factor: 1.367) .
- [13] B. Póczos and A. Lorincz.
Identification of Recurrent Neural Networks by Bayesian Interrogation Techniques.
Journal of Machine Learning Research (JMLR), 10:515–554, 2009.
(Impact factor: 3.116).
- [14] Z. Szabó, B. Póczos, and A. Lőrincz.
Undercomplete Blind Subspace Deconvolution.
Journal of Machine Learning Research (JMLR), 8:1063–1095, 2007.
(Impact factor: 3.116).
- [15] B. Póczos and A. Lőrincz.
Noncombinatorial Estimation of Independent Auto-regressive Sources.
Neurocomputing (NEUCOM), 69:2416–2419, 2006.
(Impact factor: 1.440).
- [16] G. Szirtes, B. Póczos, and A. Lőrincz.
Neural Kalman-filter.
Neurocomputing (NEUCOM), 65:349–355, 2005. ISSN: 0925-2312
(Impact factor: 1.440).
- [17] B. Szatmáry, B. Póczos, and A. Lőrincz.
Competitive Spiking, Rate Code and Indirect Entropy Minimization in Structure Finding.
Journal of Physiology, 98:407–416, 2004.
(Impact factor: 4.649).
- [18] A. Lőrincz and B. Póczos.
Cost Component Analysis.
International Journal of Neural Systems (IJNS), 13:183–192, 2003.
(Impact factor: 0.901).

- [19] A. Lőrincz, B. Póczos, G. Szirtes, and B. Tákacs.
Ockham's Razor at Work: Modeling of the Homunculus.
Brain and Mind, 3:187–220, 2002.

REFEREED JOURNAL PAPERS—SUBMITTED

- [1] A. Ramdas, S. Reddi, B. Póczos, A. Singh, and L. Wasserman.
Adaptivity and Computation-Statistics Tradeoffs for Kernel and Distance based High-dimensional Two Sample Testing.
Annals of Statistics (submitted), 2016.

REFEREED CONFERENCE/WORKSHOP PAPERS

- [1] C. Li Y. Liu and B. Póczos.
Classifier Two-Sample Test for Video Anomaly Detections.
British Machine Vision Conference (BMVC). Newcastle, UK, 2018.
(29.9% acceptance rate).
- [2] P. Sodhi, H. Sun, B. Póczos, and D. Wettergreen.
Robust Plant Phenotyping via Model-based Optimization.
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). Madrid, Spain, 2018.
- [3] S. Du, J. Lee, Y. Tian, A. Singhand, and B. Póczos.
Gradient Descent Learns One-hidden-layer CNN: Don't be Afraid of Spurious Local Minima.
International Conference on Machine Learning (ICML). Stockholm, Sweden, 2018.
(25% acceptance rate).
- [4] J. Oliva, K. Dubey, M. Zaheer, R. Salakhutdinov, E. Xing, J. Schneider, and B. Póczos.
Transformation Autoregressive Networks.
International Conference on Machine Learning (ICML). Stockholm, Sweden, 2018.
(25% acceptance rate).
- [5] S. Singla, K. Batmanghelich, and B. Póczos.
Subject2Vec: Generative-Discriminative Approach from a Bag of Image Patches to a Vector.
International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI). Granada, Spain, 2018.
- [6] S. Singh, B. Póczos, and J. Ma.
Reconstruction Risk of Convolutional Sparse Dictionary Learning.
International Conference on Artificial Intelligence and Statistics (AISTATS). Playa Blanca, Lanzarote, Canary Islands, Spain, 2018.
(33% acceptance rate).
- [7] S. Reddi, M. Zaheer, S. Sra, B. Póczos, F. Bach, R. Salakhutdinov, and A. Smola.
A Generic Approach for Escaping Saddle points.
International Conference on Artificial Intelligence and Statistics (AISTATS). Playa Blanca, Lanzarote, Canary Islands, Spain, 2018.
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- [8] K. Kandasamy, A. Krishnamurthy, J. Schneider, and B. Póczos.
Parallelised Bayesian Optimisation via Thompson Sampling.
International Conference on Artificial Intelligence and Statistics (AISTATS). Playa Blanca, Lanzarote, Canary Islands, Spain, 2018.
(33% acceptance rate).
- [9] M. Zaheer, S. Kottur, S. Ravanbakhsh, B. Póczos, R. Salakhutdinov, and A. Smola.
Deep Sets.

- Proceedings of the Neural Information Processing Systems (NIPS)*. Long Beach , CA, 2017.
(Accepted for oral presentation, 1.23% acceptance rate).
- [10] S. Du, C. Jin, J. Lee, M. Jordan, B. Póczos, and A. Singh.
Gradient Descent Can Take Exponential Time to Escape Saddle Points.
Proceedings of the Neural Information Processing Systems (NIPS). Long Beach , CA, 2017.
(Accepted for spotlight presentation, 4.69% acceptance rate).
- [11] C. Li, W. Chang, Y. Cheng, Y. Yang, and B. Póczos.
MMD GAN: Towards Deeper Understanding of Moment Matching Network.
Proceedings of the Neural Information Processing Systems (NIPS). Long Beach , CA, 2017.
(21% acceptance rate).
- [12] S. Du, J. Koushik, A. Singh, and B. Póczos.
Hypothesis Transfer Learning via Transformation Functions.
Proceedings of the Neural Information Processing Systems (NIPS). Long Beach , CA, 2017.
(21% acceptance rate).
- [13] S. Singh, B. Póczos, and J. Ma.
On the Reconstruction Risk of Convolutional Sparse Dictionary Learning.
55th Annual Allerton Conference on Communication, Control, and Computing. Monticello, IL, 2017.
- [14] J. Chang, C. Li, B. Kumar B. Póczos, and A. Sankaranarayanan.
One Network to Solve Them All — Solving Linear Inverse Problems using Deep Projection Models.
International Conference on Computer Vision (ICCV) Venice, Italy, 2017.
- [15] P. Xie, B. Póczos, and E. Xing.
Near-Orthogonality Regularization in Kernel Methods.
33rd Conference on Uncertainty in Artificial Intelligence (UAI 2017). Sydney, Australia, 2017.
(31% acceptance rate).
- [16] S. Vijayarangan, P. Sodhi, P. Kini, S. Du, H. Sun, B. Póczos, D. Apostolopoulos, and D. Wettergreen.
High-throughput Robotic Phenotyping of Energy Sorghum Crops.
11th Conference on Field and Service Robotics. Zurich, Switzerland, 2017.
- [17] K. Kandasamy, G. Dasarathy, J. Schneider, and B. Póczos.
Multi-fidelity Bayesian Optimisation with Continuous Approximations.
International Conference on Machine Learning (ICML). Sydney, Australia, 2017.
(25% acceptance rate).
- [18] J. Oliva, J. Schneider, and B. Póczos.
The Statistical Recurrent Unit.
International Conference on Machine Learning (ICML). Sydney, Australia, 2017.
(25% acceptance rate).
- [19] S. Ravanbakhsh, J. Schneider, and B. Póczos.
Equivariance Through Parameter-Sharing.
International Conference on Machine Learning (ICML). Sydney, Australia, 2017.
(25% acceptance rate).
- [20] S. Singh and B. Póczos.
Nonparanormal Information Estimation.
International Conference on Machine Learning (ICML). Sydney, Australia, 2017.
(25% acceptance rate).

- [21] W. Chang, C. Li, Y. Yang, and B. Póczos.
Data-driven Random Fourier Feature using Stein Effect.
International Joint Conference on Artificial Intelligence (IJCAI), Melbourne, Australia, 2017.
Best student paper runner-up, (26% acceptance rate).
- [22] X. Fu, K. Huang, O. Stretcu, H. Song, E. Papalexakis, P. Talukdar, T. Mitchell, N. Sidiropoulos, C. Faloutsos, and B. Póczos.
BRAINZOOM: High Resolution Reconstruction from Multi-modal Brain Signals.
SIAM Data Mining (SDM-17). Houston, TX, 2017.
(26% acceptance rate).
- [23] S. Ravanbakhsh, F. Lanusse, R. Mandelbaum, J. Schneider, and Póczos.
Enabling Dark Energy Science with Deep Generative Models of Galaxy Images.
Thirty-First AAAI Conference on Artificial Intelligence (AAAI-17). San Francisco, CA, 2017.
(24.6% acceptance rate).
- [24] K. Kandasamy, G. Dasarathy, B. Póczos, and J. Schneider.
The Multi-fidelity Multi-armed Bandit.
Proceedings of the Neural Information Processing Systems (NIPS). Barcelona, Spain, 2016.
(23% acceptance rate).
- [25] S. Singh and B. Póczos.
Finite-Sample Analysis of Fixed-k Nearest Neighbor Density Functionals Estimators.
Proceedings of the Neural Information Processing Systems (NIPS). Barcelona, Spain, 2016.
(23% acceptance rate).
- [26] A. Dubey, S. Reddi, S. Williamson, B. Póczos, A. Smola, and E. Xing.
Variance Reduction in Stochastic Gradient Langevin Dynamics.
Proceedings of the Neural Information Processing Systems (NIPS). Barcelona, Spain, 2016.
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- [27] S. Reddi, S. Sra, B. Póczos, and A. Smola.
Fast Stochastic Methods for Nonsmooth Nonconvex Optimization.
Proceedings of the Neural Information Processing Systems (NIPS). Barcelona, Spain, 2016.
(23% acceptance rate).
- [28] S. Singh, S. Du, and B. Póczos.
Efficient Nonparametric Smoothness Estimation.
Proceedings of the Neural Information Processing Systems (NIPS). Barcelona, Spain, 2016.
(23% acceptance rate).
- [29] K. Kandasamy, G. Dasarathy, J. Oliva, J. Schneider, and B. Póczos.
Gaussian Process Bandit Optimisation with Multi-fidelity Evaluations.
Proceedings of the Neural Information Processing Systems (NIPS). Barcelona, Spain, 2016.
(23% acceptance rate).
- [30] S. Reddi, S. Sra, B. Póczos, and A. Smola.
Stochastic Frank-Wolfe Methods for Nonconvex Optimization.
54th Annual Allerton Conference on Communication, Control, and Computing. Monticello, IL, 2016.
- [31] S. Reddi, S. Sra, B. Póczos, and A. Smola.
Fast Incremental Method for Smooth Nonconvex Optimization.
IEEE Conference on Decision and Control. Las Vegas, USA, 2016.
- [32] A. Tallavajhula, A. Kelly, and B. Póczos.
Nonparametric Distribution Regression Applied to Sensor Modeling.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). Daejeon, Korea.
(Accepted for oral presentation).

- [33] C. Li and B. Póczos.
Utilize Old Coordinates: Faster Doubly Stochastic Gradients for Kernel Methods.
Uncertainty in Artificial Intelligence (UAI). NYC, NY, 2016.
(31% acceptance rate).
- [34] S. Ravanbakhsh, J. Oliva, S. Fromenteau, L. Price, S. Ho, J. Schneider, and B. Póczos.
Estimating Cosmological Parameters from the Dark Matter Distribution.
International Conference on Machine Learning (ICML). NYC, NY, 2016.
(24% acceptance rate).
- [35] S. Ravanbakhsh, B. Póczos, and R. Greiner.
Boolean Matrix Factorization and Noisy Completion via Message Passing.
International Conference on Machine Learning (ICML). NYC, NY, 2016.
(24% acceptance rate).
- [36] S. Reddi, A. Hefny, S. Sra, B. Póczos, and A. Smola.
Stochastic Variance Reduction for Nonconvex Optimization.
International Conference on Machine Learning (ICML). NYC, NY, 2016.
(24% acceptance rate).
- [37] X. Wang, J. Oliva, J. Schneider, and B. Póczos.
Nonparametric Risk and Stability Analysis for Multi-Task Learning Problems.
International Joint Conference on Artificial Intelligence (IJCAI). NYC, NY, 2016.
(25% acceptance rate).
- [38] M. Ravanbakhsh, D. Schuurmans, R. Greiner, B. Póczos, and J. Schneider.
Stochastic Neural Networks with Monotonic Activation Functions.
International Conference on Artificial Intelligence and Statistics (AISTATS). Cadiz, Spain, 2016.
(Accepted for oral presentation, 6.5% acceptance rate).
- [39] J. Oliva, A. Dubey, A. Wilson, B. Póczos, J. Schneider, and E. Xing.
Bayesian Nonparametric Kernel-Learning.
International Conference on Artificial Intelligence and Statistics (AISTATS). Cadiz, Spain, 2016.
(30% acceptance rate)
<http://arxiv.org/abs/1506.08776>.
- [40] C. Li, K. Kandasamy, B. Póczos, and J. Schneider.
High Dimensional Bayesian Optimization via Restricted Projection Pursuit Models.
International Conference on Artificial Intelligence and Statistics (AISTATS). Cadiz, Spain, 2016.
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- [41] D. Sutherland, J. Oliva, B. Póczos, and J. Schneider.
Linear-time Learning on Distributions with Approximate Kernel Embeddings.
30th AAAI Conference on Artificial Intelligence (AAAI-16). Phoenix, AZ, 2016.
(26% acceptance rate).
- [42] K. Kandasamy, B. Póczos, L. Wasserman, and J. Robins.
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Proceedings of the Neural Information Processing Systems (NIPS). Montreal, Canada, 2015.
(22% acceptance rate).
- [43] S. Reddi, A. Hefny, S. Sra, B. Póczos, and A. Smola.
On Variance Reduction in Stochastic Gradient Descent and its Asynchronous Variants.

Proceedings of the Neural Information Processing Systems (NIPS). Montreal, Canada, 2015. (22% acceptance rate).

- [44] S. Reddi, B. Póczos, and A. Smola.
Communication Efficient Coresets for Empirical Loss Minimization.
Uncertainty in Artificial Intelligence (UAI). Amsterdam, NL, 2015. (34% acceptance rate).
- [45] K. Kandasamy, J. Schneider, and B. Póczos.
High Dimensional Bayesian Optimization and Bandits via Additive Models.
International Conference on Machine Learning (ICML). Lille, France, 2015. (26% acceptance rate).
- [46] K. Kandasamy, J. Schneider, and B. Póczos.
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International Joint Conference on Artificial Intelligence (IJCAI). Buenos Aires, Argentina, 2015. (Distinguished Paper Award. Out of 1,996 paper submissions with 575 accepted papers, this was one of the 2 papers to receive the award).
- [47] A. Krishnamurthy, K. Kandasamy, B. Póczos, and L. Wasserman.
On Estimating L_2^2 Divergence.
International Conference on Artificial Intelligence and Statistics (AISTATS). San Diego, CA, 2015. (26.69% acceptance rate).
- [48] J. Oliva, W. Neiswanger, B. Póczos, E. Xing, and J. Schneider.
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<http://arxiv.org/abs/1410.7414>.
- [49] Z. Szabó, A. Gretton, B. Póczos, and B. Sriperumbudur.
Two-stage Sampled Learning Theory on Distributions.
International Conference on Artificial Intelligence and Statistics (AISTATS). San Diego, CA, 2015. (Accepted for oral presentation, 6.11% acceptance rate)
<http://arxiv.org/abs/1402.1754>.
- [50] A. Ramdas, S. Reddi, A. Singh, B. Póczos, and L. Wasserman.
On the High Dimensional Power of a Linear-Time Two Sample Test under Mean-shift Alternatives.
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- [51] S. Reddi, B. Póczos, and A. Smola.
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- [52] S. Reddi, A. Ramdas, B. Póczos, A. Singh, and L. Wasserman.
On the Decreasing Power of Kernel and Distance based Nonparametric Hypothesis Tests in High Dimensions.
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- [53] S. Singh and B. Póczos.
Exponential Concentration of a Density Functional Estimator.

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- [54] S. Reddi and B. Póczos.
k-NN Regression on Functional Data with Incomplete Observations.
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- [55] A. Krishnamurthy, K. Kandasamy, B. Póczos, and L. Wasserman.
Nonparametric Estimation of Rényi Divergence and Friends.
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- [56] S. Singh and B. Póczos.
Generalized Exponential Concentration Inequality for Renyi Divergence Estimation.
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- [57] J. Oliva, B. Póczos, T. Verstynen, A. Singh, J. Schneider, F.-C. Yeh, and E.-Y. Tseng.
FuSSO: Functional Shrinkage and Selection Operator.
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- [58] J. Oliva, W. Neiswanger, B. Póczos, J. Schneider, and E. Xing.
Fast Distribution To Real Regression.
Artificial Intelligence and Statistics (AISTATS). Reykjavik, Iceland, 2014. (35.8% acceptance rate).
- [59] A. Ramdas, A. Singh, L. Wasserman, and B. Póczos.
An Analysis of Active Learning With Uniform Feature Noise.
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- [60] L. Xiong, B. Póczos, and J. Schneider.
Efficient Learning on Point Sets.
IEEE International Conference on Data Mining (ICDM'13). Dallas, TX, 2013. (Accepted as regular paper, 11% acceptance rate).
- [61] D. Sutherland, B. Póczos, and J. Schneider.
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- [62] S. J. Reddi and B. Póczos.
Scale Invariant Conditional Dependence Measures.
International Conference on Machine Learning (ICML). Atlanta, 28:1355–1363, 2013.
Journal of Machine Learning Research - Proceedings Track, (24% acceptance rate).
- [63] J. Oliva, B. Póczos, and J. Schneider.
Distribution to Distribution Regression.
International Conference on Machine Learning (ICML). Atlanta, 28:1049–1057, 2013.
Journal of Machine Learning Research - Proceedings Track, (24% acceptance rate).
- [64] B. Póczos, A. Rinaldo, A. Singh, and L. Wasserman.
Distribution-free Distribution Regression.

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(Accepted for oral presentation, 11.3% acceptance rate).

- [65] B. Póczos, Z. Ghahramani, and J. Schneider.
Copula-based Kernel Dependency Measures.
International Conference on Machine Learning (ICML). Edinburgh, Scotland, 2012.
(27.3% acceptance rate).
- [66] B. Póczos, L. Xiong, D. Sutherland, and J. Schneider.
Nonparametric Kernel Estimators for Image Classification.
IEEE Conference on Computer Vision and Pattern Recognition (CVPR). Providence, Rhode Island, USA, 2012. (24% acceptance rate).
- [67] Z. Szabó, B. Póczos, and A. Lőrincz.
Collaborative Filtering via Online Group-structured Dictionary Learning.
International Conference on Latent Variable Analysis and Signal Separation (LVA/ICA).
Tel-Aviv, Israel, 2012.
- [68] B. Póczos and J. Schneider.
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International Conference on AI and Statistics (AISTATS). La Palma, Canary Islands, 2012.
Journal of Machine Learning Research - Proceedings Track.
- [69] L. Xiong, B. Póczos, and J. Schneider.
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(22% acceptance rate).
- [70] B. Póczos, L. Xiong, and J. Schneider.
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(34% acceptance rate).
- [71] B. Póczos, Z. Szabó, and J. Schneider.
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UNREFEREED CONFERENCE/WORKSHOP PAPERS

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18th International Workshop on Advanced Computing and Analysis Techniques in Physics Research,
University of Washington, Seattle.
- [3] M. Ravanbakhsh, J. Schneider, and B. Póczos.
Deep Learning with Sets and Point Clouds.
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- [4] K. Kandasamy, A. Krishnamurthy, J. Schneider, and B. Póczos.
Thompson Sampling for Asynchronous Parallel Bayesian Optimisation.
AutoML workshop, ICML 2017, 2017.
- [5] S. Singh, Y. Yang, R. Zhang, B. Póczos, and J. Ma.
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Cold Spring Harbor Meeting on Systems Biology: Global Regulation of Gene Expression, 2017.
- [6] N. Washburn, A. Menon, K. Zhang, and B. Póczos.
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8th Advances in Cement-Based Materials (Cements 2017), ACerS Cements Division meeting. Atlanta, GA, 2017.
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Adaptivity and Computation-Statistics Tradeoffs in High-Dimensional Two Sample Testing.
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Predicting Enhancer-Promoter Interaction from Genomic Sequence with Deep Learning.
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Leveraging Machine Learning to Estimate Soil Salinity through Satellite-Based Remote Sensing.
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- [14] Z. Szabó, B. Sriperumbudur, B. Póczos, and A. Gretton.
Minimax-optimal distribution regression.
In International Society for NonParametric Statistics (ISNPS) Conference. Avignon, France, 2016.
- [15] D. Sutherland, J. Oliva, B. Póczos, and J. Schneider.
Linear-time Learning on Distributions with Approximate Kernel Embeddings.
Feature Extraction: Modern Questions and Challenges (NIPS Workshop). Montreal, Canada, 2015.
- [16] Z. Szabó, B. Sriperumbudur, B. Póczos, and A. Gretton.
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- [17] Z. Szabó, B. Sriperumbudur, B. Póczos, and A. Gretton.
Distribution Regression - Make It Simple and Consistent.
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- [18] Z. Szabó, A. Gretton, B. Póczos, and B. Sriperumbudur.
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UCL-Duke Workshop on Sensing and Analysis of High-Dimensional Data (SAHD). London, UK, 2014.
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- [21] M. Clute, A. Singh, B. Poczos, and T. Verstynen.
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- [23] X. Xu, S. Ho, M. Ntampaka, B. Póczos, J. Schneider, and H. Trac.
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- [24] B. Póczos, S. Kirshner, D. Pál, Cs. Szepesvári, and J. Schneider.
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- [25] J. Schneider, B. Póczos, L. Xiong, and A. Szalay.
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Department of Energy Applied Mathematics Program Meeting, Washington, DC, USA, 2011.
- [26] Z. Szabó, B. Póczos, and A. Lőrincz.
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 (Oral presentation).
- [27] B. Póczos, L. Xiong, and J. Schneider.
Nonparametric Divergence Estimation for Learning Manifolds of Distributions and Group Anomaly Detection. *The (Snowbird) Learning Workshop*. Fort Lauderdale, FL, USA, 2011.
 (Oral presentation).
- [28] B. Szatmáry, B. Póczos, and A. Lőrincz.
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TECHNICAL REPORTS

- [1] B. Póczos, L. Xiong, and J. Schneider.
Nonparametric Divergence Estimation and its Applications to Machine Learning, 2014.
- [2] B. Póczos and J. Schneider.
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- [3] B. Póczos, L. Xiong, D. Sutherland, and J. Schneider.
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Thorough Testing of Hierarchical Connectionist Architecture Before its Utilization for Classification Problems. Technical report, Eötvös Loránd University, Budapest, Hungary, 2001. (Technical report for Honda Future Technology Research Group).

THESES

- [1] B. Póczos.
Independent Subspace Analysis, 2007.
 Eötvös Loránd University, Budapest, Hungary. PhD Thesis.
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The Problems of Representation and Interpretation in Neural Systems, 2002.
 Eötvös Loránd University, Budapest, Hungary. MSc Thesis.

PATENTS AND INVENTION DISCLOSURES

- [1] N. Washburn, A. Menon, K. Zhang, and B. Póczos.
Machine learning optimization of complex formulations and processes.
 Disclosure of Intellectual Property, CMU, Carnegie Mellon File 2017-230, 2017.

- [2] J. Chang, C. Li, B. Póczos, V. Bhagavatula, and A. Sankaranarayanan.
Solving Linear Inverse Problems using Deep Projection Network.
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Handwriting Recognition with Deep Neural Network.
 Disclosure of Intellectual Property, CMU, 2017.
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Hierarchical Machine Learning.
 Disclosure of Intellectual Property, CMU, Carnegie Mellon File 2017-142, 2017.
- [5] M. Ravanbaksh, B. Póczos, and R. Greiner.
A New Stochastic Optimization Method Applicable to Analysis of Nuclear Magnetic Resonance Spectra. (UA ref No. 2009054).
- [6] M. Ravanbaksh, B. Póczos, and R. Greiner.
System and Method for Solving Nonlinear Optimization Problem Using Cross Entropy Exploiting Partial Decomposability. (US provisional patent application, serial number: 61/363,042).

ART EXHIBITIONS

- [1] E. Kang and B. Póczos.
GANymedes Vox, Feb 16th - March 3rd, 2018.
 Future Perfect, Ammerman Center for Arts and Technology 16th Biennial Symposium, Hygienic Art Gallery,
New London, CT.

SOFTWARE ARTIFACTS

Software implementations are available at:

<http://www.cs.cmu.edu/~bapoczos/code.html>
 and <https://github.com/bapoczos>

GRANTS

1. **Accelerating MAM Commercialization and Military Readiness: Expert-guided Machine Learning to Identify Candidate Parts and Subassemblies for Additive Manufacturing**, 2018-2019
 Source of Support: Manufacturing Futures Initiative (MFI)
 Principal Investigator: Alex Davis
 Amount: \$177,779
2. **Development of High-throughput Photoreactors and Computational Tools for the Discovery and Manufacturing of Solar Fuels and Functional Materials**, 2018-2019
 Source of Support: Manufacturing Futures Initiative (MFI)
 Principal Investigator: Stefan Bernhard
 Amount: \$177,288
3. **Machine Learning Approach to Develop High Entropy Alloy Coatings for Additive Manufacturing**, 2018-2019
 Source of Support: Manufacturing Futures Initiative (MFI)
 Principal Investigator: Maarten De Boer
 Amount: \$175,349
4. **Machine Learning Driven Automatic Generation of Electronic Systems Through Intelligent Collaboration (MAGESTIC)** 2018-2022
 Source of Support: DARPA

- Principal Investigator: David White
Co-Principal Investigators: Levent Burak Kara, and Barnabás Póczos
Amount: \$1,145,182
5. **Many-Body Perturbation Theory Meets Machine Learning to Discover Singlet Fission Materials**
Source of Support: ALCF's Aurora Early Science Program for Data and Learning 2018-2021
Principal Investigator: Noa Marom
Co-Principal Investigators: Jack Deslippe, Luca Ghiringhelli, and Barnabás Póczos
Amount: 50 million ExaFLOPS-hours, 100 TB Disk Storage, and salary support for one postdoc
 6. **Deep Learning Based Question Answering and Dialogue Systems** , 2017-2018
Source of Support: JPMorgan Chase Bank
Principal Investigator: Barnabás Póczos
Amount: \$180,000
 7. **Computer-Controlled Molecular Machinery: Using Data-Driven Chemistry to Unlock Photocatalytic Pathways to Renewable Energy**, 2018-2019
Source of Support: Kavcic-Moura Endowment Fund
Principal Investigator: Stefan Bernhard
Co-Principal Investigators: David Yaron, Kevin Noonan, Nikolaos Sahinidis, Katerina Fragkiadaki, Barnabás Póczos, and Tomasz Kowalewski
Amount: \$225,000
 8. **Interactive Learning from Sparse and Diverse Feedback**, 2017-2018
Source of Support: Air Force Research Laboratory
Principal Investigator: Aarti Singh
Co-Principal Investigators: Barnabás Póczos, and Artur Dubrawski
Amount: \$440,344
 9. **Machine Learning Unified Synchronous Experimentation (MUSE): Rapid Autonomous Discovery/Optimization of Electrode and Electrolyte Materials**, 2017-2021
Source of Support: Toyota Research Institute
Principal Investigator: Jay Whitacre
Co-Principal Investigators: Venkat Viswanathan, Barnabás Póczos, and Aditya Parameswaran
Amount: \$1,132,915
 10. **Machine Learning in Support of Additive Manufacturing**, 2017-2018
Source of Support: Manufacturing Futures Initiative (MFI)
Principal Investigators: Elizabeth A. Holm and Jack Beuth
Co-Principal Investigators: Burak Kara, Barnabás Póczos, Anthony D. Rollett, and Mahadev Satyanarayanan
Amount: \$333,901
 11. **Accessible Machine Learning**, 2017-2021
Source of Support: DARPA D3M program
Principal Investigator: Artur Dubrawski. Co-Principal Investigators: Eric Nyberg and Barnabás Póczos
Amount: \$2,099,981
 12. **Scalable Machine Learning for Automating Scientific Discovery in Astrophysics**, 2016-2019
Source of Support: NSF-III-RI Medium
Principal Investigator: Barnabás Póczos. Co-Principal Investigators: Eric Xing, Andrew Wilson, Rachel Mandelbaum. Senior Personnel: Hy Trac, Shirley Ho
Amount: \$1,099,889
 13. **Amazon Web Services (AWS) award**, 2016-2017
Principal Investigator: Barnabás Póczos.
Amount: \$4,500
 14. **Airplane Parts Demand Forecasting and Inventory Optimization**, 2015-2017
Source of Support: Boeing Aerospace Data Analytics Lab

- Principal Investigator: Jaime Carbonell, Alex Smola (2015-2016), and Barnabás Póczos.
Amount: \$1,112,547
15. **Airplane Maintenance and Handwriting Recognition**, 2015-2017
Source of Support: Boeing Aerospace Data Analytics Lab
Principal Investigator: Ravi Starzl and Barnabás Póczos.
Amount: \$619,433
 16. **Automated Terra Phenotyping System for Genetic Improvement of Energy Crops**
ARPA-E grant, 2015-2017.
Principal Investigator: William L. Rooney, Texas A&M AgriLife Research, College Station, Texas
Co-Principal Investigators: David Wettergreen, Dimitrios Apostolopoulos, Herman Herman, Barnabás Póczos (Carnegie Mellon University, Pittsburgh, Pennsylvania)
John Mullet, Alex Thomasson (Texas A&M AgriLife Research, College Station, Texas)
Amount: \$2,440,000
 17. **Anomaly Detection On Piezometer Data Collected From Embankment Dams**
Pennsylvania Infrastructure Technology Alliance, 2015.
Principal Investigator: Mario Berges, Co-Principal Investigator: Barnabás Póczos.
Amount: \$40,000
 18. **ConnPort: A standardized interface accessing human connectome data.**
ProSEED/BrainHub seed grant, 2015.
Principal Investigators: Timothy Verstynen, Aarti Singh, Barnabás Póczos.
Amount: \$45,000
 19. **Intelligent Data Ecosystem For Automation (IDEA)** (2014-2017).
Source of Support: Foxconn Technology Group
Principal Investigator: Howie Choset.
Amount: Barnabas Poczcos (co-PI) portion is \approx \$476,000.
 20. **Nonparametric machine learning on sets, functions, and distributions.**
NSF-EAGER, 2012-2014. Award Number:1250350
Principal Investigator: Barnabás Póczos; Co-Principal Investigator: Artur Dubrawski.
Amount: \$200,000
 21. **Distribution-based machine learning for high dimensional datasets.**
NSF-BIGDATA, 2012-2016. Award Number: 1247658
Principal Investigator: Aarti Singh. Co-Principal Investigators: Barnabás Póczos, Timothy Verstynen.
Amount: \$1,000,000
 22. **Machine Learning Algorithms for Matching Theories, Simulations, and Observations in Cosmology.**
DOE Program: Mathematical and Statistical Methodologies for DOE Data-Centric Science at Scale.
2014-2017
Principal Investigators: Jeff Schneider (2014-2015), Barnabás Póczos (2015-2017). Co-Principal Investigators: Chris Genovese, Shirley Ho. Senior Personnel: Peter Freeman, Rachel Mandelbaum, Chad Schafer, Hy Trac
Amount: \$1,650,000