

Amichai Painsky - Curriculum Vitae

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CONTACT INFORMATION	The Industrial Engineering Department Wolfson Building, Room 409 Tel Aviv University Tel Aviv, Israel	Office: +972-73-3804178 E-mail: amichaip@tauex.tau.ac.il Web: www.math.tau.ac.il/~amichaip
EDUCATION	Tel Aviv University , Tel Aviv, Israel	2012 - 2016
	Ph.D. in Statistics Under the joint supervision of Prof. Saharon Rosset and Prof. Meir Feder Thesis: Generalized Independent Components Analysis over Finite Alphabets	
	Tel Aviv University , Tel Aviv, Israel	2011 - 2012
	M.Sc. in Statistics Under the supervision of Prof. Saharon Rosset Thesis: Exclusive Row Biclustering Using a Combinatorial Auction Approach	
	Princeton University , Princeton, New Jersey	2008 - 2009
	M.Eng. in Electrical Engineering Under the supervision of Prof. Mung Chiang Research Field: The interdependence of social and communication networks	
	Tel Aviv University , Tel Aviv, Israel	2003 - 2007
	B.Sc. in Electrical Engineering, <i>Cum Laude</i>	
ACADEMIC POSITIONS	Tel Aviv University , Tel Aviv, Israel	2019 - present
	Senior Lecturer (Assistant Professor) The Industrial Engineering Department	
	Massachusetts Institute of Technology , Cambridge, Massachusetts	2017 - 2019
	Post-doctoral Research Fellow Hosted by Prof. Gregory Wornell	
	The Hebrew University , Jerusalem, Israel	2016 - 2019
	Post-doctoral Research Fellow The Israeli Center of Research Excellence in Algorithms (I-CORE ALGO) Hosted by Prof. Naftali Tishby	

- HONORS AND AWARDS
- HUJI Cyber Security Research Center (H-CSRC) Post-doctoral Grant 2017
 - Israeli Center of Research Excellence in Algorithms Post-doctoral Fellowship 2016
 - The Don and Sara Marejn Foundation award for outstanding Ph.D. students 2016
 - Weinstein Institute award for outstanding graduates in signal processing 2015
 - Outstanding Ph.D. student award, School of Mathematical Sciences 2013
 - Brain Return Scholarship, Israeli Center for Returning Scientists 2011
 - Dean's List for Outstanding Undergraduate Students (top 5%) 2006-2007
- SUBMISSIONS AND TECHNICAL REPORTS
- A. Adler and **A. Painsky**,
 "Feature Importance in Gradient Boosting Trees with Cross-Validation Feature Selection",
 Expert Systems with Application (ESWA), Under Review, Sep 2021
- Y. Shalev, **A. Painsky** and Y. Ben-Gal
 "Neural Joint Entropy Estimation",
 IEEE Transactions on Neural Networks and Learning Systems (TNNLS), Under Review,
 Mar 2021
- S. Rosset, R. Heller, **A. Painsky** and E. Aharoni,
 "Optimal Procedures for Multiple Testing Problems",
 Journal of American Statistical Association (JASA), Under Review, Dec 2019
- R. Shwartz-Ziv, **A. Painsky*** and N. Tishby,
 "Representation Compression and Generalization in Deep Neural Networks",
 Technical Report, Sep 2018
- BOOK CHAPTERS
- A. Painsky**,
 "Quality Assessment and Evaluation Criteria in Supervised Learning",
 The Handbook of Machine Learning for Data Science, Springer Publishing. To appear
 Apr 2020.
- JOURNAL PUBLICATIONS
- A. Painsky** and M. Feder,
 "Robust Universal Inference",
 Entropy, Special Issue on Application of Information Theory in Statistics,
 Vol 23, Issue 6, Jun 2021
- A. Painsky**, M. Feder and N. Tishby,
 "Non-linear Canonical Correlation Analysis: A Compressed Representation Approach",
 Entropy, Special Issue on Theory and Applications of Information Theoretic Machine
 Learning, Vol 22, Issue, 2, Feb 2020
- A. Painsky** and G. W. Wornell,
 "Bregman Divergence Bounds and Universality Properties of the Logarithmic Loss",
 IEEE Transactions on Information Theory, Vol, 66, Issue 3, Mar 2020
- A. Painsky**, M. Feder and N. Tishby,
 "Non-linear Canonical Correlation Analysis: a Compressed Representation Approach",
 Entropy, Special Issue on Theory and Applications of Information Theoretic Machine
 Learning, Vol 22, Issue, 2, Feb 2020

A. Painsky S. Rosset and M. Feder,
"Innovation representation of stochastic processes with application to causal inference",
IEEE Transactions on Information Theory, Vol. 66, Issue 2, Feb 2020

A. Painsky and S. Rosset,
"Lossless Compression of Random Forests",
Journal of Computer Science and Technology, Vol. 34, No. 2, pp. 494-506, Mar 2019

A. Painsky, S. Rosset and M. Feder,
"Linear Independent Component Analysis over Finite Fields: Algorithms and Bounds",
IEEE Transactions on Signal Processing, Vol. 66, Issue 22, Nov 2018

A. Painsky and N. Tishby,
"Gaussian Lower Bound for the Information Bottleneck Limit",
Journal of Machine Learning Research (JMLR), Vol. 18, Issue 1, Apr 2018

A. Painsky and S. Rosset,
"Cross-Validated Variable Selection in Tree-Based Methods Improves Predictive Performance",
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Vol. 39, No. 11, pp. 2142-2153, Nov. 2017

A. Painsky, S. Rosset and M. Feder,
"Large Alphabet Source Coding using Independent Component Analysis",
IEEE Transactions on Information Theory, Vol. 63, No. 10, pp. 6514-6529, Oct. 2017

A. Painsky, S. Rosset and M. Feder,
"Generalized Independent Component Analysis over Finite Alphabets",
IEEE Transactions on Information Theory, Vol. 62, No. 2, pp. 1038-1053, Feb. 2016

A. Painsky and S. Rosset,
"Isotonic Modeling with Non-differentiable Loss Functions with Application to Lasso Regularization",
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Vol. 38, No. 2, pp. 308-321, Feb. 2016

A. Painsky and S. Rosset,
"Optimal Set Cover Formulation for Exclusive Row Biclustering of Gene Expression",
Journal of Computer Science and Technology, Vol. 29, No. 3, pp. 423-435, Apr. 2014

COMPETITIVE
CONFERENCE
PAPERS
(LESS THAN 10%
ACCEPTANCE RATE) **A. Painsky** and S. Rosset,
"Compressing Random Forests",
IEEE 16th International Conference on Data Mining (ICDM), pp. 1131-1136, Dec. 2016

A. Painsky and S. Rosset,
"Exclusive Row Biclustering for Gene Expression Using a Combinatorial Auction Approach",
IEEE 12th International Conference on Data Mining (ICDM), pp. 1056-1061, Dec. 2012

CONFERENCE
PAPERS

- A. Painsky**,
"Refined Convergence Rates of the Good-Turing Estimator",
IEEE Information Theory Workshop (ITW), 2021, To Appear
- A. Painsky** and G. W. Wornell,
"On the Universality of the Logistic Loss Function",
IEEE International Symposium on Information Theory (ISIT), pp. 936-940, Jul. 2018
- A. Painsky**, S. Rosset and M. Feder,
"Binary Independent Component Analysis: Theory, Bounds and Algorithms",
IEEE International Workshop on Machine Learning for Signal Processing (MLSP), pp. 1-6, Sep. 2016
- A. Painsky**, S. Rosset and M. Feder,
"A simple and Efficient Approach for Adaptive Entropy Coding over Large Alphabets",
Data Compression Conference (DCC), pp. 369-378, Apr. 2016
- A. Painsky**, S. Rosset and M. Feder,
"Universal Compression of Memoryless Sources over Large Alphabets via Independent Component Analysis",
Data Compression Conference (DCC), pp. 213-222, Apr. 2015
- A. Painsky**, S. Rosset and M. Feder,
"Generalized Binary Independent Component Analysis",
IEEE International Symposium on Information Theory (ISIT), pp. 1326-1330, Jul. 2014
- A. Painsky**, S. Rosset and M. Feder,
"Memoryless Representation of Markov Processes",
IEEE International Symposium on Information Theory (ISIT), pp. 2294-2298, Jul. 2013
- A. Painsky**,
"First Order Multiple Hypothesis Tracking for the Global Nearest Neighbor Data Correlation Approach",
IEEE Sensor Data Fusion (SDF) Workshop, pp. 773-784, Sep. 2010

PATENTS

- A. Freiberger, D. Izhaky, **A. Painsky**, A. Shamir, Z. Bendet, O. Steinberg and A. Tamir,
"Apparatus and Method for Analyzing Driving data",
US Patent 13/972,134, commercialized at Verisk, Aug. 2012
- A. Freiberger, D. Izhaky, **A. Painsky**, A. Shamir, Z. Bendet, O. Steinberg and A. Tamir,
"Apparatus and Method for Detecting Driving data",
US Patent 13/964,568, commercialized at Verisk, Aug. 2012
- A. Painsky**,
"Data Fusion Method for High Computational Load",
US Patent 8,805,648, commercialized at 4-D Security Solutions, Jun. 2011
- A. Painsky**,
"System and Method for Multi-target Tracking",
US Patent 13/651,090, commercialized at 4-D Security Solutions, May 2010

RESEARCH GRANTS	• ISF Grant 963/21 for \$250,000 (sole PI)	2021-2025
	• ISF Young Faculty Equipment Grant 3354/21 for \$50,000 (sole PI)	2021-2025
	• TAU Data Science Core Research Grant for \$62,000 (co-PI with Tamir Bendory)	2020-2021
TEACHING	<i>Lecturer at Tel Aviv University</i>	
	• Introduction to Machine Learning	2021
	• Statistical Foundations of Data Science	2020, 2021
	• Statistics	2019, 2020
	• Digital Signal Processing (TAU International Program)	2015
	• Digital Signal Processing	2012 - 2014
	<i>Teaching Assistant at Tel Aviv University</i>	
	• Random Signals and Noise	2008, 2014 - 2016
	• Digital Communications	2012 - 2013
	• Introduction to Signal Processing	2006
• Introduction to Linear Systems	2006	
SERVICE	<i>Journal Editorship</i>	
	• Entropy – special issue on Statistical Methods for Complex Systems	2020-present
	<i>Journal Editorial Board Membership</i>	
	• Journal of Machine Learning Research (JMLR)	2019-present
	<i>Review Service – Statistics, Machine Learning and Data Science</i>	
	• Journal of the American Statistical Association	
	• SIAM Journal on Mathematics of Data Science	
	• Journal of Machine Learning Research	
	• Transactions on Pattern Analysis and Machine Intelligence	
	• Statistical Analysis and Data Mining	
<i>Review Service – Information Theory</i>		
• Transactions on Information Theory		
• Foundations and Trends in Communications and Information Theory		
• Entropy		
<i>Review Service – Signal Processing</i>		
• Transactions on Signal Processing		
• Journal of Selected Topics in Signal Processing		
• IEEE Signal Processing Letters		
• Signal Processing		

Technical Program Committee

- IEEE International Conference on Data Mining 2019,2021
- IEEE International Symposium on Information Theory 2020

PROFESSIONAL
EXPERIENCE

Sensomatix Ltd, Ramat Gan, Israel 2011 - 2012

Researcher

Statistical modeling, data mining and machine learning research in the field of Usage Based Car Insurance

4-D Security Solutions, South Plainfield, New Jersey 2009 - 2011

Advanced Algorithms Lead

Research and development of machine learning algorithms for a large-scale surveillance system, deployed in New York's and New Jersey's major airports

Freescle Semiconductors, Hertzelia, Israel 2006 - 2008

Communications Algorithms Engineer

Development and implementation of signal processing algorithms for third and fourth generation wireless communication devices