

## **Relative Fisher Information and Natural Gradient for Learning Large Modular Models**

*Ke Sun (King Abdullah University of Science and Technology) · Frank Nielsen (École Polytechnique)*

## **Priv'IT: Private and Sample Efficient Identity Testing**

*Bryan Cai (MIT) · Constantinos Daskalakis (MIT) · Gautam Kamath (MIT)*

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*Ilias Diakonikolas (USC) · Gautam Kamath (MIT) · Daniel Kane (UCSD) · Jerry Li (MIT) · Ankur Moitra () · Alistair Stewart (USC)*

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*Martha White (Indiana University)*

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*Umut Simsekli (Telecom ParisTech)*

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*Matej Balog (University of Cambridge) · Nilesch Tripuraneni () · Zoubin Ghahramani (University of Cambridge) · Adrian Weller (University of Cambridge)*

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*Stephen Bach (Stanford University) · Bryan He (Stanford University) · Alexander J Ratner (Stanford University) · Christopher Re (Stanford)*

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*David Budden (MIT) · Alexander Matveev (MIT) · Shibani Santurkar (MIT) · Shraman Chaudhuri (MIT) · Nir Shavit (MIT)*

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*Yunhe Wang (Peking University) · Chang Xu (University of Sydney) · Chao Xu (Peking University) · Dacheng Tao ()*

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*Vahab Mirrokni (Google Research) · Renato Leme (Google Research) · Adrian Vladu (MIT) · Sam Wong (UC Berkeley)*

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*Ke Li (UC Berkeley) · Jitendra Malik ()*

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*Wittawat Jitkrittum (UCL) · Zoltan Szabo (École Polytechnique) · Arthur Gretton (Gatsby)*

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*Mingsheng Long (Tsinghua University) · Han Zhu (Tsinghua University) · Jianmin Wang (Tsinghua University) · Michael Jordan ()*

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*Yixin Wang (Columbia University) · Alp Kucukelbir (Columbia University) · David Blei (Columbia University)*

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*Olivier Bachem (ETH Zurich) · Mario Lucic (ETH Zurich) · Andreas Krause (ETH Zurich)*

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*XIXIAN CHEN (The Chinese University of Hong Kong) · Irwin King (CUHK) · Michael Lyu (The Chinese University of Hong Kong)*

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*jaehong yoon (UNIST) · Sung Hwang ()*

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*Yaron Singer (Harvard) · Avinatan Hassidim (Bar Ilan University)*

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*Andrea Hornakova (Max Planck Institute for Informatics) · Jan-Hendrik Lange (MPI for Informatics) · Bjoern Andres (MPI for Informatics)*

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*Li Shen (School of Mathematics, South China University of Technology) · Wei Liu (Tencent AI Lab) · GanZhao Yuan () · Shiqian Ma (The Chinese University of Hong Kong)*

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*Deepak Pathak (UC Berkeley) · Pulkit Agrawal () · Alexei Efros (UC Berkeley) · Trevor Darrell (University of California at Berkeley)*

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*Aditya Chaudhry (University of Virginia) · Pan Xu (University of Virginia) · Quanquan Gu (University of Virginia)*

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*Assaf Hallak (Technion) · Shie Mannor (Technion)*

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*Dan Feldman () · Sedat Ozer (MIT) · Daniela Rus ()*

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*Carlos Riquelme Ruiz (Stanford University) · Mohammad Ghavamzadeh (Adobe) · Alessandro Lazaric ()*

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Ping Luo (The Chinese University of Hong Kong)

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Marc Law (University of Toronto) · Raquel Urtasun (University of Toronto) · Zemel Rich (University of Toronto)

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Chelsea Finn (UC Berkeley) · Pieter Abbeel (OpenAI / Berkeley) · Sergey Levine (Berkeley)

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*Taeksoo Kim () · (None) · Hyunsoo Kim (SK T-Brain) · Jungkwon Lee (SK T-Brain) · Joseph Lim (Univ. of Southern California) · Jiwon Kim (SK T-Brain)*

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*Stephan Mandt (Disney Research) · Robert Bamler (Disney Research Pittsburgh)*

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*Yuntian Deng (Harvard University) · Anssi Kanervisto (University of Eastern Finland) · Jeffrey Ling (Harvard University) · Alexander Rush (Harvard University)*

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*Pengtao Xie (Carnegie Mellon University) · Yuntian Deng (Harvard University) · Yi Zhou (Syracuse University) · Abhimanu Kumar (Groupon Inc.) · Yaoliang Yu (University of Waterloo) · James Zou (Stanford) · Eric Xing (Carnegie Mellon University)*

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*Vatsal Sharan (Stanford University) · Gregory Valiant (Stanford University)*

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*Gabriele Farina (Carnegie Mellon University) · Christian Kroer (Carnegie Mellon University) · Tuomas Sandholm (Carnegie Mellon University)*

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*Stephen Tu (UC Berkeley) · Shivaram Venkataraman (UC Berkeley) · Ashia Wilson (UC Berkeley) · Alex Gittens (UC Berkeley) · Michael Jordan () · Benjamin Recht (Berkeley)*

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*Guangyong Chen (The Chinese University of Hong Kong) · Shengyu Zhang (CUHK) · Di Lin (Shenzhen University) · Hui Huang (Shenzhen University) · Pheng Ann Heng (The Chinese University of Hong Kong)*

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*XIUYAN NI (THE GRADUATE CENTER, CUNY) · Novi Quadrianto (University of Sussex and National Research University Higher School of Economics) · Yusu Wang (Ohio State University) · Chao Chen (CUNY Queens College)*

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*Yi Xu () · Qihang Lin (Univ Iowa) · Tianbao Yang ()*

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*Carlos Villacampa-Calvo (Universidad Autónoma de Madrid) · Daniel Hernandez-Lobato (Universidad Autonoma de Madrid)*

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Manzil Zaheer (CMU) · Satwik Kottur (Carnegie Mellon University) · Amr Ahmed (Google) · Jose Moura (CMU) · Alex Smola (Amazon)

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Nilesh Tripuraneni () · Mark Rowland (University of Cambridge) · Zoubin Ghahramani (University of Cambridge) · Rich Turner (University of Cambridge)

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Gábor Braun () · Sebastian Pokutta (Georgia Tech) · Daniel Zink ()

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Guanghui Lan () · Sebastian Pokutta (Georgia Tech) · Yi Zhou () · Daniel Zink ()

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Chong Wang (Microsoft Research) · Yining Wang (CMU) · Po-Sen Huang (Microsoft Research) · Abdelrahman Mohammad (Microsoft) · Dengyong Zhou (Microsoft Research) · Li Deng (Microsoft Research)

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Fan Ma (Xian Jiaotong University) · Deyu Meng () · Qi Xie () · Zina Li () · Xuanyi Dong (University of Technology Sydney)

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Lucas Maystre (EPFL) · Matthias Grossglauser (EPFL)

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*Yatao Bian (ETH Zurich) · Joachim Buhmann () · Andreas Krause (ETH Zurich) · Sebastian Tschiatschek (ETH)*

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*Jiali Mei (Université Paris-Sud & EDF Lab) · Yohann De Castro (LMO) · Yannig Goude (EDF Lab Paris-Saclay) · Georges Hébrail (EDF Lab Paris-Saclay)*

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*Olivier Bachem (ETH Zurich) · Mario Lucic (ETH Zurich) · Hamed Hassani (ETH Zurich) · Andreas Krause (ETH Zurich)*

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*Mathieu Carrière (Inria Saclay) · Marco Cuturi (ENSAE / CREST) · Steve Oudot ()*

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*Bo Liu (Rutgers) · Xiaotong Yuan (Nanjing University of Information Science & Technology) · Lezi Wang (Rutgers) · Qingshan Liu () · Dimitris Metaxas (Rutgers)*

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*Jackson Gorham (STANFORD) · Lester Mackey (Microsoft Research)*

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*Mostafa Rahmani (University of Central Florida) · George Atia (University of Central Florida)*

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*Takayuki Osogami (IBM Research - Tokyo) · Hiroshi Kajino () · Taro Sekiyama ()*

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*Justin Gilmer (Google Brain) · Samuel Schoenholz (Google Brain) · Patrick Riley (Google) · Oriol Vinyals (DeepMind) · George Dahl (Google Brain)*

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*Qianxiao Li (Institute of High Performance Computing, A\*STAR) · Cheng Tai (Peking University) · Weinan E (Princeton University)*

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*Jonas Umlauft (Technical University of Munich) · Sandra Hirche (Technical University of Munich)*

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*Liran Szlak (Weizmann Institute of Science) · Ohad Shamir (Weizmann Institute of Science)*

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*Michael Gygli (Gifs.com) · Mohammad Norouzi (Google) · Anelia Angelova (Google Brain)*

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*Daniel Neil (Institute of Neuroinformatics) · Jun Lee (Samsung Advanced Institute of Technology) · Tobi Delbruck (Institute of Neuroinformatics) · Shih-Chii Liu (Institute of Neuroinformatics)*

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*Samual Ritter (DeepMind) · David GT Barrett (DeepMind) · Adam Santoro (DeepMind) · Matthew Botvinick (DeepMind)*

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*Yueming LYU (city university of hong kong)*

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*Salvatore Ruggieri (University of Pisa)*

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*Yuchen Zhang (Stanford) · Percy Liang (Stanford University) · Martin Wainwright (University of California at Berkeley)*

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*Isabel Valera () · Zoubin Ghahramani (University of Cambridge)*

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*Alexander Vezhnevets (DeepMind) · Simon Osindero (DeepMind) · Tom Schaul (DeepMind) · Nicolas Heess (Google DeepMind) · Max Jaderberg (DeepMind) · David Silver (Google DeepMind) · Koray Kavukcuoglu (DeepMind)*

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*Hongteng Xu (Georgia Institute of Technology) · Dixin Luo (University of Toronto) · Hongyuan Zha (Georgia Institute of Technology)*

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*Oren Rippel (WaveOne, Inc.) · Lubomir Bourdev (WaveOne, Inc.)*

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*Hanxi Jiang (Google)*

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Jiecao Chen (Indiana University Bloomington) · Xi Chen (New York University) · Qin Zhang (Indiana University Bloomington) · Yuan Zhou (Indiana University Bloomington)

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Rongda Zhu (UIUC) · Lingxiao Wang (University of Virginia) · Chengxiang Zhai (University of Illinois at Urbana-Champaign) · Quanquan Gu (University of Virginia)

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Jonathan Tompson (Google Inc.) · Kristofer Schlachter (New York University) · Pablo Sprechmann (NYU) · Ken Perlin (New York University)

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Shali Jiang (Washington University in St. Louis) · Luiz Gustavo Malkomes Muniz (Washington University in St. Louis) · Geoff Converse (Simpson College) · Alyssa Shofner (University of South Carolina) · Benjamin Moseley (Washington University in St. Louis) · Roman Garnett (Washington University in St. Louis)

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Santu Rana (Deakin University) · Cheng Li (Deakin University) · Vu Nguyen (Deakin University) · Sunil Gupta (Deakin University) · Svetha Venkatesh (Deakin University)

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He Zhao (FIT, Monash University) · Lan Du (Monash University) · Wray Buntine (Monash University)

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Alina Beygelzimer (Yahoo Research) · Francesco Orabona (Stony Brook University) · Chicheng Zhang (UCSD)

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*Mehrtash Harandi (Data61) · Mathieu Salzmann (EPFL) · Richard Hartley (Australian National University)*

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*Hongseok Namkoong (Stanford University) · Aman Sinha (Stanford University) · Steven Yadowsky (Stanford University) · John Duchi (Stanford University)*

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*Jonas Kohler (ETH Zurich) · Aurelien Lucchi (ETH)*

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*Javier González (Amazon) · Zhenwen Dai (Amazon.com) · Andreas Damianou (Amazon.com) · Neil Lawrence (Amazon.com)*

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*Oron Anschel (Technion) · Nir Baram (Technion) · Nahum Shimkin (Technion)*

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*Minsik Cho (IBM Research) · Daniel Brand ()*

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*Juho Lee (POSTECH) · Creighton Heaukulani (Cambridge University) · Lancelot James (HKUST) · Seungjin Choi (POSTECH) · Zoubin Ghahramani (University of Cambridge)*

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*Alon Brutzkus (Tel Aviv University) · Amir Globerson (Tel Aviv University)*

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*Ahmed M. Alaa Ibrahim (UCLA) · Scott Hu (UCLA) · Mihaela van der Schaar (Oxford University)*

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*Weihua Hu (The University of Tokyo) · Takeru Miyato (Preferred Networks, Inc., ATR) · Seiya Tokui (Preferred Networks/ The University of Tokyo) · Eiichi Matsumoto (Preferred Networks Inc.) · Masashi Sugiyama (RIKEN / The University of Tokyo)*

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Renata Khasanova (Ecole Polytechnique Federale de Lausanne (EPFL)) · Pascal Frossard (EPFL)

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*Friedemann Zenke (Stanford) · Ben Poole (Stanford University) · Surya Ganguli (Stanford)*

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*David Balduzzi (Victoria University Wellington)*

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*David Balduzzi (Victoria University Wellington) · Brian McWilliams (Disney Research) · Tony Butler-Yeoman (Victoria University of Wellington)*

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*David Balduzzi (Victoria University Wellington) · Marcus Frean (Victoria University Wellington) · Wan-Duo Ma (Victoria University) · Brian McWilliams (Disney Research) · Lennox Leary (VUW) · J.P. Lewis (Frostbite Labs and Victoria University)*

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*Xueyu Mao (University of Texas at Austin) · Purnamrita Sarkar (UT Austin) · Deepayan Chakrabart ()*

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*Tomoya Sakai (The University of Tokyo) · Marthinus du Plessis (Indeed) · Gang Niu (University of Tokyo) · Masashi Sugiyama (RIKEN / The University of Tokyo)*

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*Jonathan Eckstein (Rutgers University) · Noam Goldberg (Bar-Ilan University) · Ai Kagawa (Rutgers University)*

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*Lam Nguyen (Lehigh University) · Jie Liu (Lehigh University) · Katya Scheinberg (Lehigh University) · Martin Takac (Lehigh)*

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*Alexander Kolesnikov (IST Austria) · Christoph Lampert (IST Austria)*

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*Laurent Dinh (U. Montreal) · Razvan Pascanu (DeepMind) · Samy Bengio (Google Brain) · Yoshua Bengio (U. Montreal)*

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*Seiya Tokui (Preferred Networks/ The University of Tokyo) · Issei Sato (University of Tokyo)*

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*Zeyuan Allen-Zhu (Institute for Advanced Study) · Yuanzhi Li (Princeton University) · Aarti Singh () · Yining Wang (CMU)*

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*Nan Jiang (Microsoft Research) · Akshay Krishnamurthy (UMass) · Alekh Agarwal (Microsoft Research) · John Langford (Microsoft Research) · Robert Schapire (Microsoft Research)*

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*Or Sheffet (University of Alberta)*

### **Differentially Private Learning of Graphical Models using CGMs**

*Garrett Bernstein (University of Massachusetts Amherst) · Ryan McKenna () · Tao Sun () · Michael Hay () · Gerome Miklau () · Daniel Sheldon (UMass Amherst)*

### **Leveraging Union of Subspace Structure to Improve Constrained Clustering**

*Laura Balzano (University of Michigan) · John Lipor (University of Michigan)*

### **Learning Important Features Through Propagating Activation Differences**

*(None) · Peyton Greenside (Stanford University) · Anshul Kundaje (Stanford University)*

### **Probabilistic Path Hamiltonian Monte Carlo**

*Vu Dinh (Fred Hutchinson Cancer Center) · Arman Bilge (University of Washington) · Cheng Zhang (Fred Hutchinson Cancer Center) · Frederick Matsen (Fred Hutchinson Cancer Center)*

### **Asymmetric Tri-training for Unsupervised Domain Adaptation**

*Saito Kuniaki (The University of Tokyo) · Yoshitaka Ushiku (The University of Tokyo) · Tatsuya Harada ()*

### **Logarithmic Time One-Against-Some**

*Hal Daumé (University of Maryland) · NIKOS KARAMPATZIAKIS (Microsoft) · John Langford (Microsoft Research) · Paul Mineiro (Microsoft)*

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### **Identifying Best Interventions through Online Importance Sampling**

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### **Fast Bayesian Intensity Estimation for the Permanental Process**

*Christian Walder (Data61) · Adrian Bishop (Data61/ANU/UTS)*

### **Sequence to Better Sequence: Continuous Revision of Combinatorial Structures**

*Jonas Mueller (MIT) · David Gifford (MIT) · Tommi Jaakkola (MIT)*

### **A Universal Variance Reduction-Based Framework for Nonconvex Low-Rank Matrix Recovery**

*Lingxiao Wang (University of Virginia) · Xiao Zhang (University of Virginia) · Quanquan Gu (University of Virginia)*

### **Zero-Inflated Exponential Family Embeddings**

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### **Optimal Densification for Fast and Accurate Minwise Hashing**

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### **Convex Relaxation without Lifting**

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### **Differentially Private Submodular Maximization: Data Summarization in Disguise**

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*Yichi Zhou (Tsinghua University) · Jialian Li (Tsinghua University) · Jun Zhu (Tsinghua University)*

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*Junier Oliva (CMU) · Barnabás Póczos (CMU) · Jeff Schneider ()*

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*Ashish Kumar (Microsoft Research) · Saurabh Goyal (IIT Delhi) · (None)*

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*Shahin Jabbari (University of Pennsylvania) · Matthew Joseph (University of Pennsylvania) · Michael Kearns (University of Pennsylvania) · Jamie Morgenstern (University of Pennsylvania) · Aaron Roth (University of Pennsylvania)*

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*Baharan Mirzasoleiman (ETH Zurich) · Amin Karbasi (Yale) · Andreas Krause (ETH Zurich)*

## **Clustering by Sum of Norms: Stochastic Incremental Algorithm, Convergence and Cluster Recovery**

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*Sebastian Stich (EPFL) · Anant Raj (Max-Planck Institute for Intelligent Systems) · Martin Jaggi (EPFL)*

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*Quynh Nguyen (Saarland University) · Matthias Hein (Saarland University)*

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*Adam Earle (University of the Witwatersrand) · Andrew Saxe (Harvard University) · Benjamin Rosman (Council for Scientific and Industrial Research (CSIR))*

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*(None) · Mengdi Wang (Princeton University) · Dongdong Ge () · Zizhuo Wang (University of Minnesota) · Yinyu Ye ()*

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*Benjamin Rubinstein (Univ of Melbourne) · Francesco Aldà (Ruhr-Universität Bochum)*

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Walter Dempsey (University of Michigan) · Alexander Moreno (Georgia Institute of Technology) · Jim Rehg (Georgia Tech) · Susan Murphy (University of Michigan)

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Po-Wei Chou (Carnegie Mellon University) · Daniel Maturana (Carnegie Mellon University) · Sebastian Scherer (Carnegie Mellon University)

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Tsubasa Ochiai (Doshisha University) · Shinji Watanabe (MITSUBISHI ELECTRIC RESEARCH LABORATORIES) · Takaaki Hori (MITSUBISHI ELECTRIC RESEARCH LABORATORIES) · John Hershey (MITSUBISHI ELECTRIC RESEARCH LABORATORIES)

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Manolis Tsakiris (Johns Hopkins University) · Rene Vidal (Johns Hopkins University)

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Zhuoran Yang (Princeton University) · Krishnakumar Balasubramanian (Princeton) · Han Liu (Princeton University)

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Bo Yang (University of Minnesota) · Xiao Fu (University of Minnesota) · Nicholas Sidiropoulos (University of Minnesota) · Mingyi Hong (Iowa State University)

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Zi Wang (MIT) · Chengtao Li () · Stefanie Jegelka (MIT) · Pushmeet Kohli (Microsoft Research)

**On orthogonality and learning RNNs with long term dependencies**

Eugene Vorontsov (Ecole Polytechnique de Montreal) · Chiheb Trabelsi (Ecole Polytechnique de Montreal) · Christopher Pal (École Polytechnique de Montréal) · Samuel Kadoury (Ecole Polytechnique de Montreal)

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Vidyashankar Sivakumar (University of Minnesota) · Arindam Banerjee (University of Minnesota)

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Hairong Liu (Baidu Silicon Valley AI Lab) · Zhenyao Zhu (Baidu Silicon Valley AI Lab) · Xiangang Li (Baidu AI Lab) · Sanjeev Satheesh (Baidu SVAIL)

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