MATT J. KUSNER

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EMPLOYMENT

École Polytechnique de Montréal *February 2025 - Present*
Associate Professor, Department of Computer and Software Engineering

Mila - Quebec Artificial Intelligence Institute *February 2025 - Present*
Core Faculty Member

European Lab for Learning & Intelligent Systems (ELLIS) *July 2021 - Present*
ELLIS Scholar

University College London *September 2019 - February 2025*
Associate Professor in Machine Learning, Department of Computer Science

Google *November 2021 - November 2022*
Visiting Faculty Researcher

University of Oxford *October 2018 - September 2019*
Associate Professor in Machine Learning, Department of Computer Science
Tutorial Fellow at Jesus College

The Alan Turing Institute
Turing Fellow *October 2018 - October 2023*
Research Fellow *October 2016 - October 2018*

EDUCATION

Cornell University *August 2015 - August 2016*
Visiting Ph.D. student in Dept. of Computer Science
Advisor: Kilian Q. Weinberger

Washington University in St. Louis *August 2011 - August 2016*
Ph.D. from Dept. of Computer Science & Engineering
Advisor: Kilian Q. Weinberger

CITATION STATISTICS (ALL STATISTICS BASED ON SCHOLAR.GOOGLE.COM)

Total citations of all publications: 11,684
Total citations of top-three most cited publications: 6,533
H-Index: 34
Publications (inc. tech-reports) with 100 citations or more: 19
Publications (inc. tech-reports) with 10 citations or more: 46

PROFESSIONAL ACTIVITIES

Communications Chair, Conference on Causal Learning and Reasoning (CLeaR) April, 2024
Reviewer, AI2050 Early Career Fellowship, *Schmidt Futures* September, 2023
Panel Member, Discussion on the EU AI Act, *Babel* February 21, 2023
Advisory Committee Member, NeurIPS Workshop on Algorithmic Fairness December, 2022
Panel Member, The Federal Reserve Banks of Cleveland & Philadelphia November 10, 2021
Reviewer, NWO Open Competition, *Dutch Research Council* May, 2021

Book Review, Patterns, Predictions, and Actions. *MIT Press.*	April, 2021
Co-organizer, NeurIPS Workshop on Algorithmic Fairness	December, 2020
Co-organizer, NeurIPS Workshop on Machine Learning for Molecules	December, 2020
Panel Member, AI for English Law Conference, *Oxford University*	March 18, 2019
Panel Member, Explainability Expert Roundtable, *ICO*	March 13, 2019
Co-organizer, NeurIPS Workshop on ML for Molecules and Materials	December, 2018
Co-organizer, NeurIPS Workshop on Critiquing and Correcting Trends in ML	December, 2018
Panel Member, Algorithmic Bias Roundtable, *Royal Academy of Engineering*	November 5, 2018
Publications Chair, Uncertainty in Artificial Intelligence (UAI) Conference	August, 2018
Speaker, NeurIPS Press Conference	December, 2017
Co-organizer, NeurIPS Workshop on ML for Molecules and Materials	December, 2017
Workflow Chair, ICML Conference	June, 2016
Co-organizer, ICML Workshop on Resource-Efficient Machine Learning	July, 2015
Co-organizer, ICML Workshop on Learning with Test-Time Budgets	July, 2013
Area Chair, NeurIPS, ICLR, ICML	2022 - Present
Program Committee, NeurIPS, ICML, ICLR, AISTATS, FAT*, JMLR, AAAI, KDD	2015 - 2022

PUBLICITY

Google for Developers	October 2024
Fast Company	August 2023
Forbes	November 2021
European Digital Rights (EDRi) network	September 2021
Gensim	2021
UK Government Centre for Data Ethics and Innovation	November 2020
Harvard Business Review	October 2020
Wired	February 2019
Forbes	March 2018
The New Scientist	October 2017
The Guardian	August 2017
The New Scientist	March 2017
The Future of Life Institute's Top AI Breakthroughs of 2015	December 2015
OpenTable	August 2015

INVITED TALKS

McGill Talks AI	April, 11th, 2025
Two Sigma	August 8th, 2024
Cambridge Ellis Unit Summer School on Probabilistic Machine Learning	July 18th, 2024
MSR Montreal	April 17, 2024
Pint of Science	May 11, 2022
The Federal Reserve Banks of Cleveland and Philadelphia	November 10, 2021
RIKEN High-dimensional Statistical Modeling Team Seminar	November 9, 2021
ELLIS Workshop on Causethical ML	July 26, 2021
Cambridge Tech & Society	November 19, 2020
Oxford CS Open Day	May 11, 2019
Faculty of Law, Oxford University	March 18, 2019
Birmingham UAS Student Conference	March 19, 2019
Talking Machines Podcast	November 1, 2018
AI and ML in Cambridge (CamAIML)	March 15, 2018

Cambridge Centre for Mathematical Sciences	February 20, 2018
Oxford Computational Statistics and Machine Learning Seminar	February 16, 2018
The Royal Society	February 12, 2018
Cambridge University Engineering Department	September 12, 2017

TEACHING

University College London

Applied Machine Learning	COMP0081	193 students (Masters and undergraduate)	Spring 2024
Applied Machine Learning	COMP0081	194 students (Masters and undergraduate)	Spring 2023
Applied Machine Learning	COMP0081	211 students (Masters and undergraduate)	Spring 2022
Applied Machine Learning	COMP0081	181 students (Masters and undergraduate)	Spring 2021

University College London

Tutorial on Causal Inference	Fall 2020

University of Oxford

Digital Systems	Tutorial	4 students (undergraduate)	Spring 2019
Discrete Mathematics	Tutorial	6 students (undergraduate)	Spring 2019
Imperative Programming Parts 1& 2	Tutorial	4 students (undergraduate)	Spring 2019
Linear Algebra	Tutorial	6 students (undergraduate)	Fall 2018
Discrete Mathematics	Tutorial	6 students (undergraduate)	Fall 2018

Oxford Warwick Statistics Programme

Tutorial on Fairness and Causal Inference	Spring 2018

GRADUATE SUPERVISION

PhD alumni

Limor Gultchin	defended, co-advised with Varun Kanade	Spring 2024 (Oxford)

thesis: *Causal and Trustworthy Machine Learning: Methods and Applications*

Qi Liu	defended, co-advised with Phil Blunsom	Spring 2023 (Oxford)

thesis: *Better conditioning on context for natural language processing*

David Watson	defended, co-advised with Luciano Floridi	Spring 2021 (Oxford)

thesis: *Explaining black box algorithms: epistemological challenges and machine learning solutions*

PhD students under supervision

Yuchen (Caroline) Zhu	estimated completion: Spring 2025
Jean Kaddour	estimated completion: Spring 2025
Gbétondji Dovonon	estimated completion: Spring 2027
Leo Richter	estimated completion: Spring 2028

PHD THESIS COMMITTEES

Wenlin Chen, *Bridging Deep Learning and Probabilistic Inference*, University of Cambridge, 2025.
Gábor Melis, *Towards Better Generative Models of Language*, DeepMind/UCL, 2023.
Márton Havasi, *Advances in Compression using Probabilistic Models*, University of Cambridge, 2021.
James Townsend, *Lossless Compression with Latent Variable Models*, UCL, 2020.
Matej Balog, *Converting to Optimization in Machine Learning: Perturb-and-Map, Differential Privacy, and Program Synthesis*, University of Cambridge, 2020.

AWARDS

Royal Society Leverhulme Trust Senior Research Fellowship   October 2024 - October 2025
ICLR Notable Area Chair   May 2023
ICML Top 33% Reviewer   June 2020
ICML Top 5% Reviewer   June 2019
NeurIPS Top 30% Reviewer   December 2018
The Alan Turing Institute Research Fellowship   October 2016 - October 2018
Washington University in St. Louis Turner Dissertation Award   December 2016
Konhauser Award for Mathematical Achievement   May 2011

PUBLICATIONS

Yuchen Zhu, Daniel Augusto de Souza, Zhengyan Shi, Mengyue Yang, Pasquale Minervini, Matt J. Kusner, Alexander D'Amour
When Can Proxies Improve the Sample Complexity of Preference Learning?
The International Conference on Machine Learning (ICML), 2025.

Vignesh Gopakumar, Ander Gray, Lorenzo Zanisi, Timothy Nunn, Stanislas Pamela, Daniel Giles, Matt J. Kusner, Marc Peter Deisenroth
Calibrated Physics-Informed Uncertainty Quantification
The International Conference on Machine Learning (ICML), 2025.

Leo Richter, Xuanli He, Pasquale Minervini, Matt J. Kusner
An Auditing Test to Detect Behavioral Shift in Language Models
The International Conference on Learning Representations (ICLR), 2025.

Hansley Narasiah, Ouail Kitouni, Andrea Scorsoglio, Bernd K Sturdza, Shawn Hatcher, Kelsi Katcher, Javad Khalesi, Dolores Garcia, Matt J. Kusner
Machine Learning Discovery of Cost-Efficient Dry Cooler Designs for Concentrated Solar Power Plants
Scientific Reports, 2024.

Vignesh Gopakumar, Stanislas Pamela, Lorenzo Zanisi, Zongyi Li, Ander Gray, Daniel Brennand, Nitesh Bhatia, Gregory Stathopoulos, Matt Kusner, Marc Peter Deisenroth, Anima Anandkumar, JOREK Team, MAST Team
Plasma Surrogate Modelling using Fourier Neural Operators
Nuclear Fusion, 2024.

Katherine Tsai, Stephen Pfohl, Olawale Salaudeen, Nicole Chiou, Matt Kusner, Alexander D'Amour, Sanmi Koyejo, Arthur Gretton
Proxy Methods for Domain Adaptation
The International Conference on Artificial Intelligence and Statistics (AISTATS), 2024.

Jean Kaddour*, Oscar Key*, Piotr Nawrot, Pasquale Minervini, Matt J. Kusner
No Train No Gain: Revisiting Efficient Training Algorithms For Transformer-based Language Models
Neural Information Processing Systems (NeurIPS), 2023.
∗ authors contributing equally, listed in alphabetical order

Ibrahim Alabdulmohsin*, Nicole Chiou*, Alexander D'Amour* Arthur Gretton*, Sanmi Koyejo*, Matt J. Kusner*, Stephen R. Pfohl*, Olawale Salaudeen*, Jessica Schrouff*, Katherine Tsai*
Adapting to Latent Subgroup Shifts via Concepts and Proxies
The International Conference on Artificial Intelligence and Statistics (AISTATS), 2023.

Valentina Zantedeschi, Luca Franceschi, Jean Kaddour, Matt J. Kusner, Vlad Niculae
DAG Learning on the Permutahedron
The International Conference on Learning Representations (ICLR), 2023.

Kirtan Padh, Jakob Zeitler, David Watson, Matt J. Kusner, Ricardo Silva, Niki Kilbertus
Stochastic Causal Programming for Bounding Treatment Effects
Conference on Causal Learning and Reasoning (CLeaR), 2023.

Jean Kaddour, Linqing Liu, Ricardo Silva, Matt J. Kusner
When Do Flat Minima Optimizers Work?
Neural Information Processing Systems (NeurIPS), 2022.

Natalie Maus, Haydn T. Jones, Juston S. Moore, Matt J. Kusner, John Bradshaw, Jacob R. Gardner
Local Latent Space Bayesian Optimization over Structured Inputs
Neural Information Processing Systems (NeurIPS), 2022.

Yuchen Zhu, Limor Gultchin, Arthur Gretton, Matt J. Kusner, Ricardo Silva
Causal Inference with Treatment Measurement Error: A Nonparametric Instrumental Variable Approach
The Conference on Uncertainty in Artificial Intelligence (UAI), 2022. *Oral Presentation*

Nitin Agrawal, James Bell, Adrià Gascón, Matt J. Kusner
MPC-Friendly Commitments for Publicly Verifiable Covert Security
The Conference on Computer and Communications Security (CCS), 2021

Jean Kaddour, Yuchen Zhu, Qi Liu, Matt J. Kusner, Ricardo Silva
Causal Effect Inference for Structured Treatments
Neural Information Processing Systems (NeurIPS), 2021

Hanchen Wang, Qi Liu, Xiangyu Yue, Joan Lasenby, Matt J. Kusner
Unsupervised Point Cloud Pre-Training via View-Point Occlusion, Completion
The International Conference on Computer Vision (ICCV), 2021

Valentina Zantedeschi, Matt J. Kusner, Vlad Niculae
Learning Binary Decision Trees by Argmin Differentiation
The International Conference on Machine Learning (ICML), 2021

Limor Gultchin, David Watson, Matt J. Kusner, Ricardo Silva
Operationalizing Complex Causes: A Pragmatic View of Mediation
The International Conference on Machine Learning (ICML), 2021

Afsaneh Mastouri* Yuchen Zhu*, Limor Gultchin, Anna Korba, Ricardo Silva, Matt J. Kusner, Arthur Gretton, Krikamol Muandet
Proximal Causal Learning with Kernels: Two-Stage Estimation and Moment Restriction
The International Conference on Machine Learning (ICML), 2021
∗ equal contribution

Qi Liu, Matt J. Kusner, Phil Blunsom
Counterfactual Data Augmentation for Neural Machine Translation
North American Chapter of the Association for Computational Linguistics (NAACL), 2021

Niki Kilbertus, Matt J. Kusner, Ricardo Silva
A Class of Algorithms for General Instrumental Variable Models
Neural Information Processing Systems (NeurIPS), 2020

John Bradshaw, Brooks Paige, Matt J. Kusner, Marwin H. S. Segler, Jos Miguel Hernndez-Lobato

Barking up the right tree: an approach to search over molecule synthesis DAGs
Neural Information Processing Systems (NeurIPS), 2020. Spotlight Presentation

Matt J. Kusner, Joshua R. Loftus
The long road to fairer algorithms
Nature (Comment), 2020

Limor Gultchin, Matt J. Kusner, Varun Kanade, Ricardo Silva
Differentiable Causal Backdoor Discovery
The International Conference on Artificial Intelligence and Statistics (AISTATS), 2020

John Bradshaw, Brooks Paige, Matt J. Kusner, Marwin H. S. Segler, Jos Miguel Hernndez-Lobato
A Model to Search for Synthesizable Molecules
Neural Information Processing Systems (NeurIPS), 2019

Niki Kilbertus, Philip J. Ball, Matt J. Kusner, Adrian Weller, Ricardo Silva
The Sensitivity of Counterfactual Fairness to Unmeasured Confounding
The Conference on Uncertainty in Artificial Intelligence (UAI), 2019

Matt J. Kusner, Chris Russell, Joshua R. Loftus, Ricardo Silva
Making Decisions that Reduce Discriminatory Impact
The International Conference on Machine Learning (ICML), 2019

Nitin Agrawal*, Ali Shahin Shamsabadi*, Matt J. Kusner, Adrià Gascón
QUOTIENT: Two-Party Secure Neural Network Training and Prediction
The Conference on Computer and Communications Security (CCS), 2019

John Bradshaw, Matt J. Kusner, Brooks Paige, Marwin H. S. Segler, José Miguel Hernández-Lobato
A Generative Model For Electron Paths
International Conference on Learning Representations (ICLR), 2019

Amartya Sanyal, Matt J. Kusner, Adrià Gascón, Varun Kanade
TAPAS: Tricks to Accelerate (encrypted) Prediction As a Service
International Conference on Machine Learning (ICML), 2018

Niki Kilbertus, Adrià Gascón, Matt J. Kusner, Michael Veale, Krishna Gummadi, Adrian Weller
Blind Justice: Fairness with Encrypted Sensitive Attributes
International Conference on Machine Learning (ICML), 2018

David Janz, Jos van der Westhuizen, Brooks Paige, Matt J. Kusner, José Miguel Hernández-Lobato
Learning a Generative Model for Validity in Complex Discrete Structures
International Conference on Learning Representations (ICLR), 2018

Chirs Russell*, Matt J. Kusner*, Joshua R. Loftus, Ricardo Silva
When Worlds Collide: Integrating Different Counterfactual Assumptions in Fairness
Neural Information Processing Systems (NIPS), 2017

Matt J. Kusner*, Joshua R. Loftus*, Chirs Russell*, Ricardo Silva
Counterfactual Fairness (oral presentation)
Neural Information Processing Systems (NIPS), 2017

Matt J. Kusner, Brooks Paige, José Miguel Hernández-Lobato
Grammar Variational Autoencoder
International Conference on Machine Learning (ICML), 2017

Gao Huang, Chuan Guo, Matt J. Kusner, Yu Sun, Kilian Q. Weinberger, Fei Sha
Supervised Word Mover's Distance (oral presentation)

Neural Information Processing Systems (NIPS), 2016

Matt J. Kusner, Yu Sun, Karthik Sridharan, Kilian Q. Weinberger
Private Causal Inference (oral presentation)
Artificial Intelligence and Statistics (AISTATS), 2016

Gustavo Malkomes, Matt J. Kusner, Wenlin Chen, Kilian Q. Weinberger, Benjamin Moseley
Fast Distributed k-Center Clustering with Outliers on Massive Data
Neural Information Processing Systems (NIPS), 2015

Matt J. Kusner, Yu Sun, Nicholas I. Kolkin, Kilian Q. Weinberger
From Word Embeddings to Document Distances
International Conference on Machine Learning (ICML), 2015

Matt J. Kusner, Jacob R. Gardner, Roman Garnett, Kilian Q. Weinberger
Differentially Private Bayesian Optimization
International Conference on Machine Learning (ICML), 2015

Zhixiang (Eddie) Xu, Matt J. Kusner, Kilian Q. Weinberger, Minmin Chen, Olivier Chapelle
Classifier Cascades and Trees for Minimizing Feature Evaluation Cost
Journal of Machine Learning Research (JMLR), 2014

Matt J. Kusner, Wenlin Chen, Quan Zhou, Zhixiang (Eddie) Xu, Kilian Q. Weinberger, Yixin Chen
Feature-Cost Sensitive Learning with Submodular Trees of Classifiers
AAAI Conference on Artificial Intelligence (AAAI), 2014

Matt J. Kusner, Stephen Tyree, Kilian Q. Weinberger, Kunal Agrawal
Stochastic Neighbor Compression
International Conference on Machine Learning (ICML), 2014

Jacob R. Gardner, Matt J. Kusner, Zhixiang (Eddie) Xu, Kilian Q. Weinberger, John P. Cunningham
Bayesian Optimization with Inequality Constraints
International Conference on Machine Learning (ICML), 2014

Zhixiang (Eddie) Xu, Matt J. Kusner, Gao Huang, Kilian Q. Weinberger
Anytime Feature Learning
International Conference on Machine Learning (ICML), 2013

Zhixiang (Eddie) Xu, Matt J. Kusner, Kilian Q. Weinberger, Minmin Chen
Cost-Sensitive Tree of Classifiers
International Conference on Machine Learning (ICML), 2013

Preprints

Gbètondji Jean-Sebastien Dovonon, Michael M. Bronstein, Matt J. Kusner
Setting the Record Straight on Transformer Oversmoothing, 2024.

Jean Kaddour, Aengus Lynch, Qi Liu, Matt J. Kusner, Ricardo Silva
Causal Machine Learning: A Survey and Open Problems, 2023.

Qi Liu, Matt J. Kusner, Phil Blunsom
A Survey on Contextual Embeddings

Valentina Zantedeschi, Fabrizio Falasca, Alyson Douglas, Richard Strange, Matt J. Kusner, Duncan Watson-Parris
Cumulo: A Dataset for Learning Cloud Classes
NeurIPS Workshop Tackling Climate Change with Machine Learning, 2019. *Best Paper Award.*

Joshua R. Loftus, Chris Russell, Matt J. Kusner, Ricardo Silva
Causal Reasoning for Algorithmic Fairness, May 2018

Jacob R. Gardner*, Paul Upchurch*, Matt J. Kusner, Yixuan Li, Kilian Q. Weinberger, Kavita Bala, John E. Hopcroft
Deep Manifold Traversal: Changing Labels with Convolutional Features, March 2016