MATT J. KUSNER

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EMPLOYMENT

University College London   *September 2019 - Present*
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

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

The Alan Turing Institute
Turing Fellow   *October 2018 - Present*
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

PROFESSIONAL ACTIVITIES

Conference on Causal Learning and Reasoning (CLeaR)   April, 2024
Communications Chair   *Los Angeles, California*

NeurIPS Workshop: Algorithmic Fairness through the Lens of Causality and Privacy   2022
Advisory Committee

NeurIPS Workshop: Algorithmic Fairness through the Lens of Causality and Interpretability
2020 *Co-organizer*

NeurIPS Workshop: Machine Learning for Molecules   December, 2020
Co-organizer

NIPS Workshop: Critiquing and Correcting Trends in Machine Learning   December, 2018
Co-organizer   *Montreal, Canada*

NIPS Workshop: Machine Learning for Molecules and Materials   December, 2017; 2018
Co-organizer   *Long Beach, CA; Montreal, Canada*

Uncertainty in Artificial Intelligence (UAI) Conference   August, 2018
Publications Chair   *Monterey, CA*

NIPS Press Conference December, 2017
Invited Speaker *Long Beach, CA*

NIPS Workshop on Machine Learning for Molecules and Materials December, 2017
Co-organizer *Long Beach, CA*

ICML Conference June, 2016
Workflow Chair *New York, NY*

ICML Workshop: Resource-Efficient Machine Learning July, 2015
Co-organizer *Lille, France*

ICML Workshop: Learning with Test-Time Budgets June, 2013
Co-organizer *Atlanta, GA*

AI2050 Early Career Fellowship Reviewer September, 2023
Schmidt Futures

ICLR 2023 Notable Area Chair May, 2023

NWO Open Competition May, 2021
Dutch Research Council

Patterns, Predictions, and Actions April, 2021
MIT Press

ICML 2020 Top 33% Reviewer June, 2020

ICML 2019 Top 5% Reviewer June, 2019

NeurIPS 2018 Top 30% Reviewer December, 2018

Area Chair NeurIPS, ICLR, ICML

Program Committee NeurIPS, ICML, ICLR, AISTATS, FAT*, JMLR, AAAI, KDD

PUBLICITY

Fast Company August 2023
https://tinyurl.com/46y4ht8z

Forbes November 2021
https://tinyurl.com/bdb84kd9

UK Government Centre for Data Ethics and Innovation November 2020
https://tinyurl.com/76wfe7rb

Harvard Business Review October 2020
https://tinyurl.com/3yatpnc4

Wired February 2019
https://tinyurl.com/y29n58tl

Forbes March 2018
https://tinyurl.com/yxbrpwxz

The Guardian August 2017
https://tinyurl.com/y893qsto

The New Scientist March 2017
https://tinyurl.com/l4zfkv2

The Future of Life Institute December 2015
https://tinyurl.com/y3xgnmgy

OpenTable August 2015
https://tinyurl.com/y3ohyyw3

INVITED TALKS

Babel February 21, 2023
The EU AI Act: Implications for the Technology Sector

Pint of Science May 11, 2022

The Federal Reserve Banks of Cleveland and Philadelphia November 10, 2021
Causality for Fair Lending

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
Causality

Faculty of Law, Oxford University March 18, 2019
AI for English Law Conference Panel on AI and Ethics

Birmingham UAS Student Conference March 19, 2019

The Alan Turing Institute March 13, 2019
To support the Information Commissioners Office Explainability Expert Roundtable

Royal Academy of Engineering November 5, 2018
To support the Department of Digital, Culture, Media and Sport Algorithmic Bias Roundtable

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   Spring 2018
Tutorial on Fairness and Causal Inference

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

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

AWARDS

Research Fellowship   2016-2018
The Alan Turing Institute   *London, UK*

Turner Dissertation Award   December 2016
Washington University in St. Louis   *St. Louis, MO*
(awarded yearly to the best Ph.D. dissertation)

Konhauser Award for Mathematical Achievement   May 2011
Macalester College   *St. Paul, MN*
(awarded yearly to the top senior student in computer science)

PUBLICATIONS

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

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

Journal Publications

Mrinal Pahwa, Matt J. Kusner, Carl Hacker, David Bundy, Kilian Q. Weinberger, Eric Leuthardt
Optimizing the Detection of Wakeful and Sleep-Like States for Future Electrocorticographic Brain Computer Interface Applications
PLOS ONE Journal, 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

Preprints

Gbètondji Jean-Sebastien Dovonon, Michael M. Bronstein, Matt J. Kusner
Setting the Record Straight on Transformer Oversmoothing, 2023.

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