KONSTANTIN GENIN

Cluster of Excellence
Machine Learning: New Perspectives for Science
Department of Computer Science
Eberhard Karls Universität Tübingen
Tübingen, Germany

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AREA OF SPECIALIZATION

Philosophy of Machine Learning and Statistics, Philosophy of Science, Formal Epistemology

ACADEMIC POSITIONS

Leader of Independent Research Group: Spring 2020—Present
"Epistemology and Ethics of Machine Learning,"
at the Cluster of Excellence:
"Machine Learning: New Perspectives for Science,"
Department of Computer Science
Eberhard Karls Universität, Tübingen.

Postdoctoral Fellow, Department of Philosophy Fall 2018—Spring 2020
Faculty of Arts and Sciences, University of Toronto.

EDUCATION

Doctor of Philosophy, Logic, Computation and Methodology Fall 2012—Spring 2018
Department of Philosophy, Carnegie Mellon University
Dissertation Title: *The Topology of Statistical Inquiry.*
Dissertation Advisor: Kevin T. Kelly.

Master of Science, Logic, Computation and Methodology Fall 2012—Spring 2015
Department of Philosophy, Carnegie Mellon University
Thesis Title: *Theory Choice, Theory Change, and Inductive Truth-Conduciveness.*
Thesis Advisor: Kevin T. Kelly.

Bachelors of Arts, Mathematics and Philosophy Fall 2005—Spring 2009
Departments of Mathematics and Philosophy resp., Brown University
Magna Cum Laude

PRIMARY SUPERVISION

PhD Student, Raysa Benatti Summer 2023—Present

Group Member "Epistemology and Ethics of Machine Learning,"
Project Title: *Measuring the Effects of Bias in Statistical Software Used in Legal Systems.*

(Visiting) PhD Student, Mykhailo Bogachov Summer 2023—Present
Group Member "Epistemology and Ethics of Machine Learning,"
Project Title: *Ethical Implications of Performative Prediction in Machine Learning.*

PhD Student, Sebastian Zezulka Summer 2022—Present
Group Member "Epistemology and Ethics of Machine Learning,"
Project Title: *Unfairness in Predicting Long-term Unemployment.*

Postdoctoral Fellow, Dr. Vlasta Sikimić March 2022—June 2023
Group Member "Epistemology and Ethics of Machine Learning,"
Project Title: *Ethics, Privacy and Fairness in Digital Education Environments.*

Postdoctoral Fellow, Dr. Sander Beckers June 2021—January 2023
Group Member "Epistemology and Ethics of Machine Learning,"
Project Title: *Causal Reasoning for the Ethical Developement of AI.*

PUBLICATIONS

Konstantin Genin, Thomas Grote, Thomas Wolfers (2024) "Computational Psychiatry and the Evolving Concept of a Mental Disorder." *Synthese*, 204(3).

Sebastian Zezulka, Konstantin Genin (2024) "From the Fair Distribution of Predictions to the Fair Distribution of Social Goods: Evaluating the Impact of Fair Machine Learning on Long-Term Unemployment." *ACM Conference on Fairness, Accountability, and Transparency* (FAccT 2024).

Thomas Grote, Konstantin Genin, Emily Sullivan (2024) "Reliability in Machine Learning." *Philosophy Compass*, 19(5).

Sebastian Zezulka, Konstantin Genin (2023) "Performativity and Prospective Fairness." *NeurIPS Workshop: Algorithmic Fairness Through the Lens of Time.*

Konstantin Genin, Conor Mayo-Wilson (2022) "Success Concepts for Causal Discovery," *Behaviormetrika.*

Konstantin Genin (2022) "On Falsifiable Statistical Hypotheses," *Philosophies,* 7(2).

Konstantin Genin (2021) "Statistical Undecidability in Linear, Non-Gaussian Models in the Presence of Latent Confounders," In Proceedings *Thirty-Fifth Conference on Neural Information Processing Systems* (NeurIPS, 2021).

Konstantin Genin, Thomas Grote (2021) "Randomized Controlled Trials in Medical AI: A Methodological Critique," *Philosophy of Medicine*, 2(1).

Konstantin Genin, Conor Mayo-Wilson (2020). "Statistical Decidability in Linear, Non-Gaussian Models," Spotlight in *Causal Discovery and Causality-Inspired Machine Learning Workshop* at the *Thirty-Fourth Conference on Neural Information Processing Systems* (NeurIPS, 2020).

Konstantin Genin, Franz Huber (2020). "Formal Representations of Belief," in Edward N. Zalta, ed., *The Stanford Encyclopedia of Philosophy.*

Konstantin Genin (2019). "Full and Partial Belief," in Richard Pettigrew and Jonathan Weisberg, eds., *The Open Handbook of Formal Epistemology.* PhilPapers Foundation. pp. 437-498.

Konstantin Genin, Kevin T. Kelly (2018). "Theory Choice, Theory Change and Inductive Truth-Conduciveness," *Studia Logica,* 107(5): 948-989.

Konstantin Genin, Kevin T. Kelly (2017). "The Topology of Statistical Verifiability," in Jérôme Lang, ed., *Proceedings of the Sixteenth Conference on Theoretical Aspects of Rationality and Knowledge* (TARK), pp. 236-250.

Kevin T. Kelly, Konstantin Genin, Hanti Lin (2016). "Realism, Rhetoric, and Reliability," *Synthese,* 193(4): 1191-1223.

Konstantin Genin, Kevin T. Kelly (2015). "Theory Choice, Theory Change, and Inductive Truth-Conduciveness," in R. Ramanujam, ed., *Proceedings of the Fifteenth Conference on Theoretical Aspects of Rationality and Knowledge* (TARK), pp. 111-121.

Kevin T. Kelly, Konstantin Genin (2014). "Complexity, Ockham's Razor, and Truth," in M. Lissack and A. Graber, eds., *Modes of Explanation: Affordances for Action and Prediction.* Palgrave Macmillian, pp. 121-131.

Ryan Carlson, Konstantin Genin, Martina Rau, Richard Scheines (2013). "Student Profiling from Tutoring System Log Data: When do Multiple Graphical Representations Matter?" in S.K. D'Mello et. al. eds., *Proceedings of the 6th International Conference on Educational Data Mining* (EDM, 2013), pp. 12-20.

TEACHING EXPERIENCE

Course Instructor **Tübingen University**

Philosophy of Science for Machine Learning — Winter 2024-5
Seminar

Philosophy and AI — Summer 2024
Seminar with Hong Yu Wong (Philosophy Faculty, Tübingen)

Cameron Buckner's *From Deep Learning to Rational Machines* — Winter 2024
Block Seminar with Hong Yu Wong (Philosophy Faculty, Tübingen)

Philosophy of Science for Machine Learning [syllabus] — Winter 2023-4
Seminar

Ethics and Philosophy of Machine Learning [syllabus] — Summer 2022
Seminar with Thomas Grote (Cluster of Excellence: ML for Science, Tübingen)

Course Instructor **Carnegie Mellon University**
Causation, Law and Social Policy — Spring 2018
with Richard Scheines

Introduction to Political Philosophy [syllabus] — Summer 2017

Introduction to Philosophy [syllabus] — Fall 2016

Causation, Law and Social Policy [syllabus] — Spring 2016
with Richard Scheines

Introduction to Philosophy [syllabus] — Summer 2015

Introduction to Philosophy [syllabus] — Summer 2014

TALKS

"The Fair Distribution of Predictions, or Social Goods?"

1. Center for Philosophy, Science and Policy — March 2024
   Università Politecnica Delle Marche.
2. Epistemological Issues of Machine Learning in Science — February 2024
   TU Dortmund.

3. Division of Humanities and Social Sciences — January 2024
   Caltech.

"Performativity and Prospective Fairness" — December 2023
NeurIPS Workshop: Fairness Throught the Lens of Time
New Orleans.

"Machine Learning as Policy Science" — December 2023
Lingnan-Cambridge Workshop on AI in Science
Cambridge.

"Performativity and Prospective Fairness" — November 2023
Ethical AI Workshop @ Comète
Inria Polytechnique, Paris.

"Tragic Randomization? A Mythical Conflict Between Science and Ethics" — November 2023
Fifth Sowerby Interdisciplinary Workshop
King's College London.

"Why Not Reliability?" — October 2023
AI, Trustworthiness and Explainability (AITE) Conference
Tübingen.

"A Novum Organum? Machine Learning and Experimental Design" — May 2023
Philosophy of ML Tübingen-Hannover Workshop
Leibniz University Hannover.

"Reconsidering the Foundations of Experimental Design"

1. Logic, Uncertainty, Computation and Inforumation (LUCI) Seminar — April 2023
   University of Milan.
2. Epistemology and Theory of Machine Learning — March 2023
   Munich Center for Mathematical Philosophy.

"Morals and Methodology" — February, 2023
Technopolitics Conference
University of Coimbra.

"On Falsifiable Statistical Hypotheses" — January, 2023
Logic Colloquium
University of Konstanz.

"Simplicity and Scientific Progress"

1. Philosophy @ High Performance Computing Center — July 2023
   Universität Stuttgart.
2. Colloquium in Logic and Philosophy of Science — June 2023
   Munich Center for Mathematical Philosophy.
3. Imre Lakatos Centenary Conference — November 2022
   London School of Economics.

"Randomization, Causal Discovery and Individualized Treatment"

1. SciCAR-Konferenz — August 2022
   Dortmund.
2. German Society for Philosophy of Science — August 2022
   Technische Universität Berlin.
3. Leibniz Workshop on Digital Ethics — July 2022
   Leibniz Universität Hannover.
4. Philosophy of Socially Aware Data Science — June 2022
   University of Pennsylvania.
5. First Luxembourg Workshop on Epistemology and AI, — June 2022
   Luxembourg.

"On Falsifiable Statistical Hypotheses" — May, 2022
Formal Epistemology Workshop
UC Irvine.

"Success Concepts for Causal Discovery" — March, 2022
International Workshop on Causality and Philosophy
Shiga University, Kyoto (virtual).

"Against Predictive Invariance" — November, 2021
with Alexander Tolbert,
Philosophy of Science Association Conference
Baltimore.

"Exploitation, or Amelioration? — November, 2021
Dueling Pictures of Data-Scientific Rationality"
with Alexander Tolbert,
Philosophy of Science Association Conference
Baltimore.

"Against Predictive Invariance" — October, 2021
with Alexander Tolbert,
Bias and Discrimination in Algorithmic Decision-Making
Leibniz Universität, Hannover.

"Statistical Decidability in Linear, Non-Gaussian Causal Models" September, 2021
with Conor Mayo-Wilson,
Combining Probability and Logic (Progic 2021)
Ludwing-Maximilians-Universität München, Virtual Conference.

"Statistical Decidability in Confounded, Linear Non-Gaussian Causal Models" July, 2021
Neglected Assumptions in Causal Inference Workshop
38th International Conference on Machine Learning (ICML 2021)
Virtual Conference.

"Clinical Equipoise and Causal Discovery" July, 2021
Seminar Series of the Cluster of Excellence:
"Machine Learning: New Perspectives for Science"
Eberhard Karls Universität, Tübingen (Virtual).

"Statistical Decidability in Linear, Non-Gaussian Causal Models" December, 2020
with Conor Mayo-Wilson,
Causal Discovery and Causality-Inspired Machine Learning Workshop
34th Conference on Neural Information Processing Systems (NeurIPS 2020)
Virtual Conference.

"Morals and Methodology" December, 2020
Seminar Series of the Cluster of Excellence:
"Machine Learning: New Perspectives for Science"
Eberhard Karls Universität, Tübingen (Virtual).

"Simplicity and Scientific Progress"

1. Logic and Philosophy of Science Research Group Seminar, October 2019
   Univeristy of Toronto.
2. American Philosophical Association, Central Division February 2020
   Chicago.
3. Foundations of Probability Seminar, November 2020
   Princeton (Virtual).
4. Logic and Interactive Rationality Seminar, December 2020
   Amsterdam (Virtual).

"Progressive Methods for Causal Discovery" August, 2019
16th International Congress
Logic, Methodology and Philosophy of Science and Technology (CLMPST)
Czech Technical University, Prague.

"Topological Learning Theory" June, 2019
Workshop in Philosophy and Physical Computing,

Virginia Tech, Blacksburg.

"Progressive Methods for Statistical Inquiry" March, 2019
Statistics Department Seminar,
Washington University, St Louis.

"Inductive vs. Deductive Statistical Inference" November, 2018
26th Biennial Meeting of the Philosophy of Science Association,
Seattle, Washington.

"The Topology of Statistical Inquiry" October 20, 2018
Workshop on Logic, Information, and Topology, CMU, Pittsburgh.

"Progressive Methods for Causal Discovery" September 22, 2018
Workshop on Foundations of Causal Discovery, CMU, Pittsburgh.

"Topological Epistemology of Science" June 23-29, 2018
with Kevin T. Kelly,
North American Summer School of Logic, Language and Information (NASSLLI),
CMU, Pittsburgh.

"Simplicity and Scientific Progress" June 2-3, 2018
7th CSLI Workshop on Logic, Rationality, and Intelligent Interaction,
Stanford, California.

Reply to "Two Cheers for Akrasia" (Kevin Dorst) January 2018
Meeting of the American Philosophical Association Eastern Division,
Savannah, Georgia.

"The Topology of Statistical Verifiability" July 2017
XVI^{th} Conference on Theoretical Aspects of Rationality and Knowledge,
University of Liverpool.

"How Inductive is Bayesian Conditioning?" July 2017
Workshop in Experience and Updating,
University Bochum, Germany.

"The Topology of Statistical Inquiry." June 2017
Workshop in Philosophy and Physical Computing,
Virginia Tech, Blacksburg (Invited Talk).

"What is Statistical Deduction?" June 2017
Workshop in Modality and Method,
CMU, Pittsburgh.

Reply to "Credal Omniscience and Relevance Confirmation." (Joel Pust) March 2017
Meeting of the American Philosophical Association Central Division,
Kansas City.

"Deduction, Induction, Statistics and Topology." November 2016
with Kevin T. Kelly,
Workshop in the Logical Structure of Correlated Information Change,
Institute for Logic, Language and Computation, Amsterdam.

"A Topological Explanation of Empirical Simplicity." November 2016
with Kevin T. Kelly,
Philosophy of Science Association Meeting,
Altanta.

"Deduction, Induction, and Statistical Inference." September 2016
with Kevin T. Kelly,
Philosophy of Scientific Experimentation 5,
University of Belgrade.

"Simplicity and Scientific Questions." June 2016
Questions and Attitudes Workshop,
Carnegie Mellon Univeristy, Pittsburgh.

"Theory Choice, Theory Change, and Inductive Truth Conduciveness."

1. Bristol-Gröningen Conference in Formal Epistemology, July 2015
   University of Bristol.
2. XV^{th} Conference on Theoretical Aspects of Rationality and Knowledge, June 2015
   Carnegie Mellon.
3. Formal Epistemology Workshop, May 2015
   University of Washington, St. Louis.
4. CSLI Workshop on Logic, Rationality, and Intelligent Interaction, May 2015
   Stanford (Invited Talk).

"A Topological Theory of Empirical Simplicity." November 2014
with Kevin T. Kelly, Hanti Lin,
Philosophy of Science Association Meeting,
Chicago.

"Learning with Ockham: Simplicity in Inductive Inference." October 2014
Cool Logic Seminar,
Institute for Logic, Language and Computation, Amsterdam.

"An Epistemic Justification of Ockham's Razor" October 2014

with Kevin T. Kelly,
René Descartes Lectures,
Tilburg University.

"The St. Petersburg Paradox." July 2014
with Remco Heesen,
Swiss Institute Exhibition,
New York City.

"Contraction and the Loss of True Belief."
with Ted Shear,

1. North American Summer School in Logic, Language, and Information, June 2014
   Univeristy of Maryland, College Park.
2. Canadian Society for History and Philosophy of Science Meeting, May 2014
   St. Catherine's, Ontario.
3. Association of Symbolic Logic North American Meeting, May 2014
   University of Colorado, Boulder.
4. Colombian Conference in Logic, Epistemology and Phil. of Science, February 2014
   Universidad de Los Andes, Bogota.

"Tracking and Statistical Knowledge." January 2014
11th Annual Graduate Student Conference in Epistemology,
University of Miami.

"When do Multiple Graphical Representations Matter?" July 2013
with Ryan Carlson, et. al.
Educational Data Mining Conference,
Memphis.

"Empirical Simplicity, Efficient Inquiry, and Ockham's Razor." June 2013
with Kevin T. Kelly, Hanti Lin,
Workshop on the Logic of Simplicity,
Carnegie Mellon, Pittsburgh.

DISCIPLINARY SERVICE

Conf. Organizer, *Philosophy of Science Meets Machine Learning* (PhilML 2024) Sep 2024
Conf. Organizer, *Philosophy of Science Meets Machine Learning* (PhilML 2023) Sep 2023
Conf. Organizer, *Philosophy of Science Meets Machine Learning* (PhilML 2022) Oct 2022
Program Committee, *Euro. Conference on Machine Learning* (ECML 2022) Spring 2022
Program Committee, *Uncertainty in Aritificial Intelligence* (UAI 2022) Spring 2022

Organizer, Pitt-CMU Grad Conference in Philosophy — March 2017
Program Committee, NASSLLI — Summer 2014

MEMBERSHIPS

American Philosophical Association
Philosophy of Science Association

LANGUAGES

Language	Speaking	Reading	Writing
English	Fluent	Fluent	Fluent
German	Proficient	Proficient	Intermediate
Russian	Fluent	Proficient	Beginner
French	Intermediate	Intermediate	Beginner