Lars van der Laan

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Education

University of Washington 2021–Present
Ph.D. in Statistics; Advisors: Marco Carone, Alex Luedtke

University of California, Berkeley 2019–2020
M.A. in Statistics

University of Groningen, Netherlands 2016–2019
B.Sc. in Mathematics and Physics, Cum Laude

Appointments

Netflix, Graduate Research Fellow (with Aurélien Bibaut, Nathan Kallus) 2024–2026
Netflix, Machine Learning Research Intern Summer 2024
UC Berkeley, Comp. Precision Health, Visiting Student Researcher (with A. Alaa) 2023–2024
University of Washington, Teaching Assistant (Ph.D. Theory Sequence) 2022–2023
University of Washington, Research Assistant, Department of Statistics 2021–Present
Fred Hutchinson Cancer Center, Research Assistant (with Peter Gilbert) 2021–2024
Fred Hutchinson Cancer Center, Research Intern (with Peter Gilbert) 2020–2021
Genentech, Research Intern (with Jonathan Levy) Summer 2020
UC Berkeley, Environ. Health Sciences, Research Assistant (with Andres Cardenas) 2020–2021

Research Interests

Causal inference; semiparametric statistics and debiased machine learning; statistical learning theory and heterogeneous treatment effects; policy learning, reinforcement learning, and dynamic experiments; predictive inference, uncertainty quantification, and calibration.

Awards & Fellowships

Netflix Graduate Research Fellowship, 2024–2026 (Mentors: Aurélien Bibaut, Nathan Kallus)
Best Paper Award, CLeaR (Conference on Causal Learning and Reasoning), 2025
Poster Award, Tom Ten Have Honorable Mention, American Causal Inference Conference (ACIC), 2025

Research Publications

Preprints

[1] Liang, Z., **van der Laan, L.** and Alaa, A. "Hybrid Meta-learners for Estimating Heterogeneous Treatment Effects". In: *arXiv preprint arXiv:2506.13680* (2025).

[2] **van der Laan, L.**, Bibaut, A., Kallus, N. and Luedtke, A. "Automatic debiased machine learning for smooth functionals of nonparametric m-estimands". In: *arXiv preprint arXiv:2501.11868* (2025).

[3] **van der Laan, L.**, Hubbard, D., Tran, A., Kallus, N. and Bibaut, A. "Semiparametric double reinforcement learning with applications to long-term causal inference". In: *arXiv preprint arXiv:2501.06926* (2025).

[4] **van der Laan, L.**, Kallus, N. and Bibaut, A. "Nonparametric Instrumental Variable Inference with Many Weak Instruments". In: *arXiv preprint arXiv:2505.07729* (2025).

[5] Wyss, R., Hansen, B. B., Hahn, G.**, van der Laan, L.** and Lin, K. J. "Undersmoothed LASSO Models for Propensity Score Weighting and Synthetic Negative Control Exposures for Bias Detection". In: *arXiv preprint arXiv:2506.17760* (2025).

[6] **van der Laan, L.**, Carone, M. and Luedtke, A. "Combining T-learning and DR-learning: A framework for oracle-efficient estimation of causal contrasts". In: *arXiv preprint arXiv:2402.01972* (2024).

[7] **van der Laan, L.**, Luedtke, A. and Carone, M. "Doubly robust inference via calibration". In: *arXiv preprint arXiv:2411.02771* (2024).

[8] Dutta, S., Wei, H.**, van der Laan, L.** and Alaa, A. M. "Estimating uncertainty in multimodal foundation models using public internet data". In: *arXiv preprint arXiv:2310.09926* (2023).

[9] **van der Laan, L.**, Carone, M., Luedtke, A. and van der Laan, M. "Adaptive debiased machine learning using data-driven model selection techniques". In: *arXiv preprint arXiv:2307.12544* (2023).

[10] **van der Laan, L.** and Gilbert, P. B. "Semiparametric logistic regression for inference on relative vaccine efficacy in case-only studies with informative missingness". In: *arXiv e-prints* (2023), arXiv–2303.

[11] Gilbert, P., Montefiori, D., McDermott, A., et al. "Immune correlates analysis of the mRNA-1273 COVID-19 vaccine efficacy trial. medRxiv 2021: 2021.08. 09.21261290". In: *Reprint requests Address requests for reprints to: Prof Dr Med Julian Schulze zur Wiesch, I. Department of Internal Medicine, University Medical Center Hamburg-Eppendorf, Martinistraße* 52 (2021), p. 20249.

[12] van der Laan, M., Wang, Z. **and van der Laan, L.** "Higher order targeted maximum likelihood estimation". In: *arXiv preprint arXiv:2101.06290* (2021).

Conference Papers

[1] **van der Laan, L.** and Alaa, A. M. "Generalized Venn and Venn-Abers Calibration with Applications in Conformal Prediction". In: *Proceedings of the 42nd International Conference on Machine Learning (ICML)*. Proceedings of Machine Learning Research. Feb. 2025.

[2] **van der Laan, L.**, Lin, Z., Carone, M. and Luedtke, A. "Stabilized Inverse Probability Weighting via Isotonic Calibration". In: *Proceedings of the 3rd Conference on Causal Learning and Reasoning (CLeaR)*. Best Paper Award. PMLR. 2025.

[3] **van der Laan, L.** and Alaa, A. M. "Self-Calibrating Conformal Prediction". In: *The Thirty-eighth Annual Conference on Neural Information Processing Systems*. 2024.

[4] **van der Laan, L.**, Ulloa-Perez, E., Carone, M. and Luedtke, A. "Causal isotonic calibration for heterogeneous treatment effects". In: *Proceedings of the 40th International Conference on Machine Learning (ICML)*. Vol. 202. PMLR. 2023.

Journal Articles

[1] Cardenas, A., Fadadu, R.**, van der Laan, L.**, Ward-Caviness, C., Granger, L., Diaz-Sanchez, D., Bind, M. and Devlin, R. *Controlled Human Exposures to Diesel Exhaust: A Human Epigenome-Wide Experiment of Target Bronchial Epithelial Cells. Environmental Epigenetics*.

[2] Andrews, L. I., Halloran, M. E., Neuzil, K. M.**, van der Laan, L.**, Huang, Y., Andriesen, J., Patel, M., Fisher, L. H., Janes, H., Rouphael, N., et al. "Evaluating the Test-Negative Design for COVID-19 Vaccine Effectiveness Using Randomized Trial Data: A Secondary Cross-Protocol Analysis of 5 Randomized Clinical Trials". In: *JAMA Network Open* 8.5 (2025), e2512763–e2512763.

[3] Khodasevich, D., Holland, N.**, van der Laan, L.** and Cardenas, A. "A SuperLearner-based pipeline for the development of DNA methylation-derived predictors of phenotypic traits". In: *PLOS Computational Biology* 21.2 (2025), e1012768.

[4] van der Laan, M., Qiu, S., Tarp, J. M. **and van der Laan, L.** "Adaptive TMLE for the Average Treatment Effect Based on a Randomized Controlled Trial Augmented with Real-World Data". In: *Journal of Causal Inference* (2025). Forthcoming.

[5] Wang, Z.**, van der Laan, L.**, Petersen, M., Gerds, T., Kvist, K. and Laan, M. v. d. "Targeted maximum likelihood based estimation for longitudinal mediation analysis". In: *Journal of Causal Inference* 13.1 (2025), p. 20230013.

[6] Kenny, A., Duijn, J. van, Dintwe, O., Heptinstall, J., Burnham, R., Sawant, S., Zhang, L., Mielke, D., Khuzwayo, S., Omar, F. L., et al. "Immune correlates analysis of the Imbokodo (HVTN 705/HPX2008) efficacy trial of a mosaic HIV-1 vaccine regimen evaluated in Southern African people assigned female sex at birth: a two-phase case-control study". In: *EBioMedicine* 108 (2024).

[7] Zhang, B., Fong, Y., Fintzi, J., Chu, E., Janes, H. E., Kenny, A., Carone, M., Benkeser, D.**, van der Laan, L.**, Deng, W., et al. "Omicron COVID-19 immune correlates analysis of a third dose of mRNA-1273 in the COVE trial". In: *Nature Communications* 15.1 (2024), p. 7954.

[8] Benkeser, D., Fong, Y., Janes, H. E., Kelly, E. J., Hirsch, I., Sproule, S., Stanley, A. M., Maaske, J., Villafana, T., Houchens, C. R., et al. "Immune correlates analysis of a phase 3 trial of the AZD1222 (ChAdOx1 nCoV-19) vaccine". In: *npj Vaccines* 8.1 (2023), p. 36.

[9] Benkeser, D., Montefiori, D. C., McDermott, A. B., Fong, Y., Janes, H. E., Deng, W., Zhou, H., Houchens, C. R., Martins, K., Jayashankar, L., et al. "Comparing antibody assays as correlates of protection against COVID-19 in the COVE mRNA-1273 vaccine efficacy trial". In: *Science Translational Medicine* 15.692 (2023), eade9078.

[10] Collender, P., Bozack, A. K., Veazie, S., Nwanaji-Enwerem, J. C.**, van der Laan, L.**, Kogut, K., Riddell, C., Eskenazi, B., Holland, N., Deardorff, J., et al. "Maternal adverse childhood experiences (ACEs) and DNA methylation of newborns in cord blood". In: *Clinical epigenetics* 15.1 (2023), p. 162.

[11] Fong, Y., Huang, Y., Borate, B.**, van der Laan, L.**, Zhang, W., Carpp, L. N., Cho, I., Glenn, G., Fries, L., Gottardo, R., et al. "Antibody correlates of protection from severe respiratory syncytial virus disease in a vaccine efficacy trial". In: *Open Forum Infectious Diseases*. Vol. 10. 1. Oxford University Press US. 2023, ofac693.

[12] Fong, Y., Huang, Y., Benkeser, D., Carpp, L. N., Áñez, G., Woo, W., McGarry, A., Dunkle, L. M., Cho, I., Houchens, C. R., et al. "Immune correlates analysis of the PREVENT-19 COVID-19 vaccine efficacy clinical trial". In: *Nature Communications* 14.1 (2023), p. 331.

[13] Turley, C. B., Tables, L., Fuller, T., Sanders, L. J., Scott, H., Moodley, A., Davis, A. W., Leav, B., Miller, J., Schoemaker, K., et al. "Modifiers of COVID-19 vaccine efficacy: Results from four COVID-19 prevention network efficacy trials". In: *Vaccine* 41.33 (2023), pp. 4899–4906.

[14] **van der Laan, L.**, Zhang, W. and Gilbert, P. B. "Nonparametric estimation of the causal effect of a stochastic threshold-based intervention". In: *Biometrics* 79.2 (2023), pp. 1014–1028.

[15] Daredia, S., Huen, K.**, van der Laan, L.**, Collender, P. A., Nwanaji-Enwerem, J. C., Harley, K., Deardorff, J., Eskenazi, B., Holland, N. and Cardenas, A. "Prenatal and birth associations of epigenetic gestational age acceleration in the Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS) cohort". In: *Epigenetics* 17.13 (2022), pp. 2006–2021.

[16] Fong, Y., McDermott, A. B., Benkeser, D., Roels, S., Stieh, D. J., Vandebosch, A., Le Gars, M., Van Roey, G. A., Houchens, C. R., Martins, K., et al. "Immune correlates analysis of the ENSEMBLE single Ad26. COV2. S dose vaccine efficacy clinical trial". In: *Nature Microbiology* 7.12 (2022), pp. 1996–2010.

[17] Gilbert, P. B., Montefiori, D. C., McDermott, A. B., Fong, Y., Benkeser, D., Deng, W., Zhou, H., Houchens, C. R., Martins, K., Jayashankar, L., et al. "Immune correlates analysis of the mRNA-1273 COVID-19 vaccine efficacy clinical trial". In: *Science* 375.6576 (2022), pp. 43–50.

[18] **van der Laan, L.**, Cardenas, A., Vermeulen, R., Fadadu, R. P., Hubbard, A. E., Phillips, R. V., Zhang, L., Breeze, C., Hu, W., Wen, C., et al. "Epigenetic aging biomarkers and occupational exposure to benzene, trichloroethylene and formaldehyde". In: *Environment international* 158 (2022), p. 106871.

[19] Cardenas, A., Fadadu, R. P.**, van der Laan, L.**, Ward-Caviness, C., Granger, L., Diaz-Sanchez, D., Devlin, R. B. and Bind, M.-A. "Controlled human exposures to diesel exhaust: a human epigenome-wide experiment of target bronchial epithelial cells". In: *Environmental Epigenetics* 7.1 (2021), dvab003.

[20] Nwanaji-Enwerem, J. C., Chung, F. F.-L.**, Laan, L. van der**, Novoloaca, A., Cuenin, C., Johansson, H., Bonanni, B., Hubbard, A. E., Smith, M. T., Hartman, S. J., et al. "An epigenetic aging analysis of randomized metformin and weight loss interventions in overweight postmenopausal breast cancer survivors". In: *Clinical Epigenetics* 13.1 (2021), p. 224.

[21] Nwanaji-Enwerem, J. C.**, van der Laan, L.**, Avakame, E. F., Scott, K. A., Burris, H. H. and Cardenas, A. "Associations of DNA methylation mortality risk markers with congenital microcephaly from zika virus: a study of brazilian children less than 4 years of age". In: *Journal of Tropical Pediatrics* 67.1 (2021), fmab020.

[22] Nwanaji-Enwerem, J. C.**, van der Laan, L.**, Kogut, K., Eskenazi, B., Holland, N., Deardorff, J. and Cardenas, A. "Maternal adverse childhood experiences before pregnancy are associated with epigenetic aging changes in their children". In: *Aging (Albany NY)* 13.24 (2021), p. 25653.

[23] Nwanaji-Enwerem, J. C., Nwanaji-Enwerem, U.**, van der Laan, L.**, Galazka, J. M., Redeker, N. S. and Cardenas, A. "A longitudinal epigenetic aging and leukocyte analysis of simulated space travel: the mars-500 mission". In: *Cell reports* 33.10 (2020).

Selected Talks

Invited Oral Presentations

Forum on the Integration of Observational and Randomized Data (FIORD), Center for Targeted Machine Learning and Causal Inference (CTML), Washington, DC, 2023 — *Adaptive Debiased Machine Learning using Data-Driven Model Selection Techniques*
International Conference on Computational and Methodological Statistics (CMStatistics), Berlin, Germany, 2023 — Organized Session: *Targeted Machine Learning and Causal Inference with Applications in Medicine — Adaptive Debiased ML with Model Selection*
Western North American Region of the International Biometric Society (WNAR/IBS), Anchorage, AK, 2023 — Organized Session: *Novel Methods to Identify and Use Surrogate Markers in Clinical Trials — Nonparametric Inference on the Causal Effect of a Stochastic Threshold-Based Intervention*

Contributed Oral Presentations

American Causal Inference Conference (ACIC), Detroit, MI, 2025 — *Automatic Double Reinforcement Learning in Semiparametric MDPs*
Conference on Causal Learning and Reasoning (CLeaR), Lausanne, Switzerland, 2025 — *Stabilized IPW via Isotonic Calibration* (Best Paper)
MIT Conference on Digital Experimentation (CODE), Cambridge, MA, 2024 — *Long-Term*

Causal Inference from Short-Term Experiments using Reinforcement Learning

Seminars

Université de Montpellier, Julie Josse Group, 2025
International Seminar on Selective Inference, Online, 2024
Stanford Causal Inference Working Group, Stanford, CA, 2023
University of Pennsylvania Causal Inference Seminar, Philadelphia, PA, 2023

Contributed Posters

ICML 2025, Vancouver, BC — *Generalized Venn and Venn-Abers Calibration*
ACIC 2025, Detroit, MI, USA — *Automatic Doubly Robust Inference via Calibration*
NeurIPS 2024, Vancouver, BC — *Self-Calibrating Conformal Prediction*
ACIC 2024, Seattle, WA — *Combining T-learning and DR-learning: A Framework for Oracle-Efficient Estimation of Causal Contrasts*
ICML 2023, Honolulu, HI — *Causal Isotonic Calibration for HTEs*

Professional Service

Reviewer: *JRSS–B*, *JASA*, *Biometrika*, *Biostatistics*, *Journal of Applied Econometrics*, *EJS*, *JMLR*, *JCI*, *NeurIPS*

Session Organizer:
ACIC, 2024 — *Highly Adaptive Lasso and Adaptive TMLE in Causal Inference*
International Symposium on Biopharmaceutical Statistics (ISBS), 2024 — *Recent Advances in Highly Adaptive Lasso (HAL) and its Crucial Role in Causal Inference*

Teaching Experience

University of Washington
PhD Theory Sequence in Statistics (STAT 581, 582, 583), Teaching Assistant, 2022–2023
Wrote exams, led weekly sections, held office hours, graded assignments, and mentored graduate students

University of California, Berkeley
Introduction to Probability and Statistics (STAT 201A, 201B), Personal Tutor for Biostatistics Group, 2019–2020

University of Groningen
Introduction to Mathematics for Biomedical Sciences, Teaching Assistant, 2018
Three-week intensive course; led multiple sections weekly, graded assignments, and mentored undergraduate students