

**UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE & DENTISTRY
CURRICULUM VITAE**

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Date of Birth: August 12, 1981

CURRENT POSITIONS

Associate Professor, Department of Biostatistics and Computational Biology.
University of Rochester School of Medicine & Dentistry, Rochester, NY

EDUCATION

1998-2003	BS in Statistics, Isfahan University of Technology, Isfahan, Iran
2003-2006	MS in Statistics, Shahid Beheshti University, Tehran, Iran
2008-2011	PhD in Statistics, McGill University, Montreal, Canada

POST-DEGREE TRAINING

2011-2014	Postdoctoral Fellow in Statistics, University of Michigan
2014-2016	Postdoctoral Fellow in Statistics, Wharton School, University of Pennsylvania

FACULTY APPOINTMENTS

2016-2020	Assistant Professor, Department of Biostatistics and Computational Biology, University of Rochester School of Medicine & Dentistry, Rochester, NY
2020-present	Associate Professor, Department of Biostatistics and Computational Biology, University of Rochester School of Medicine & Dentistry, Rochester, NY

HONORS AND AWARDS

2009	Schulich scholarship, Department of Mathematics and Statistics, McGill University.
2010	Schulich scholarship, Department of Mathematics and Statistics, McGill University.
2011	David Pelletier Prize (The best PhD thesis), Department of Mathematics and Statistics, McGill University.

ACADEMIC & PROFESSIONAL ORGANIZATIONS

2011-present	American Statistical Association
2011-present	International Biometric Society, ENAR

PROFESSIONAL SERVICE ASSIGNMENTS

2020 Co-organizer (with Max Little-Aston University, Susan Murphy-Harvard University, Ciprian Crainiceanu- Johns Hopkins University), workshop on *Use of Wearable and Implantable Devices in Health Research*, Banff, Canada.

EDUCATIONAL CONTRIBUTIONS

Graduate Students:

2017-2019 Hao Sun, Biostatistics, Department of Biostatistics and Computational Biology (Co-advisor)
2017-present William Artman, Biostatistics, Department of Biostatistics and Computational Biology (Co-advisor)
2018-present Jeremiah Jones, Biostatistics, Department of Biostatistics and Computational Biology (Co-advisor)

Classroom Teaching:

McGill University:

2009 MATH 203, Principles of Statistics I, Fall semester
2009 MATH 204, Principles of Statistics II, Winter semester
2010 MATH 204, Principles of Statistics II, Winter semester

University of Rochester:

2017 BST 511, Causal Inference, Fall semester
2018 BST 512, Semiparametric Theory, Spring semester
2019 BST 511, Causal Inference, Fall semester

EDITORIAL ASSIGNMENTS IN PROFESSIONAL JOURNALS

Ad hoc reviews for:

Journal of the American Statistical Association
Biometrika
Annals of Statistics
Journal of the Royal Statistical Society, Series B & C
Biostatistics
Biometrics
Statistics in Medicine
Statistical Methods in Medical Research
Lifetime Data Analysis
Pharmacoepidemiology and Drug Safety
Epidemiology
Epidemiologic Methods.

Editorial Assignments

2011-present Associate Editor, International Journal of Biostatistics

GRANTS & CONTRACTS

As Principal Investigator / Co-Principal Investigator

5UL1TR002001 Ertefaie (PI) 06/01/18 – 05/31/19 2.28 calendar
 UR-CTSI: The University of Rochester's Clinical and Translation Science Institute – Novel
 Methods Pilot

Machine Learning Based Mediation Analysis: Application in a Study of Birth Weight

The primary objective of this proposal is to develop a methodology that can be used for selecting important mediators, and to improve model fit by leveraging machine learning techniques.

R21AA027571 Ertefaie (PI) 06/15/19-05/31/21 3.00 calendar
 NIAAA

Optimal dynamic treatment strategies for controlling alcohol use: novel methods for selecting and incorporating effect modifiers

This project aims to address the need for robust, rigorous and computationally efficient methods for estimating the optimal treatment regime in substance use disorder.

R01DA048764 Ertefaie (PI) 09/30/2019 – 08/31/2023 3.00 calendar
 NIDA

Analyzing Sequential, Multiple Assignment, Randomized Trials in the Presence of Partial Compliance

We propose a novel Bayesian machine learning approach that can be used to construct deeply tailored (i.e. individualized) treatment strategies that consider patients' demographic factors, measures of mental health and alcohol use, obsessive-compulsive drinking and alcohol craving scales, physical composite scores.

P30 ES001247 Ertefaie (PI) 10/01/18 – 09/31/19 1.20 calendar

The University of Rochester's NIEHS Environmental Health Sciences Center

Mediation analysis with multiple treatments and time-varying mediators: Application in a study of birth outcomes and ambient pollution concentrations

The main goal is to use the NYS air pollution data to assess the causal pathways from the air quality policy initiatives to birth outcomes (i.e., low birth weight and preterm birth) that goes through changes in ambient air pollutant concentrations.

University of Rochester Ertefaie (PI) 08/01/2019-07/31/2020 No Salary
 Requested

Pilot project grant through the *Center for Health + Technology Clinical Neuroscience Pilot Program*, part of the Del Monte Institute for Neuroscience Pilot Program.

Comparative effectiveness studies for treatment strategies in Parkinson's Disease.

The grant focuses on developing individualized treatment strategies for Parkinson's disease.

Other Roles

1001 Ghazi (PI) 09/06/18 – 08/31/19 0.60 calendar

Simulated Inanimate Models, LLC

Development and Validation of Physical Anatomic Models for Surgical Training Using 3D Printing Technology

of life among diabetic patients. It leverages advanced machine learning and causal inference tools to discover variables that contribute to the BP target individualization among a long list of variables (e.g., demographics, clinical profile).

Not Assigned Storch & Fitzgerald (PI) 1.20 6mth; 0.60 6th mth calendar PCORI

Investigating Medication Selection and Discontinuation Strategies for Pediatric Anxiety
Dr. Ertefaie will be involved in design and execution of methodologic aspects of the adaptive treatment strategy analyses and interpreting findings from treatment effect heterogeneity modeling.

Role: Co-Investigator

PRESENTATIONS

* denotes trainee / supervisee

National & International Conferences

- 2007 Fifth Workshop on Bayesian Inference in Stochastic Processes, *Bayesian Analysis of Software Reliability Models With Reference Prior*, Valencia, Spain, Poster presentation.
- 2009 International Conference on Causal Inference in Statistics and the Quantitative Sciences, *Comparing Approaches to Causal Inference for Longitudinal Data: Inverse Probability of Treatment Weighting versus Propensity Scores*, Banff, Canada, Poster presentation.
- 2010 Statistical Society of Canada, *Double Bias in Causal Inference*, Quebec City, Canada
- 2013 Joint Statistical Meetings, *Constructing Dynamic Treatment Regimes in Infinite-Horizon Settings*, Montreal, Canada
- 2013 10th International Conference on Health Policy Statistics, *Estimating Individualized Treatment Regimes in Infinite-Horizon Settings* Chicago, USA
- 2015 International Biometric Society (ENAR), *Identifying the Set of Best Treatment Regimes*, Miami, USA
- 2015 31st International Conference on Pharmacoepidemiology & Therapeutic Risk Management, *Instrumental Variable Methods for Continuous Outcomes that Accommodate Non-ignorable Missing Baseline Values*, Boston, USA
- 2017 International Biometric Society (ENAR), *Discovering treatment effect heterogeneity through post-treatment variables*, Washington, USA
- 2017 Joint Statistical Meetings, *Sensitivity Analysis and Power in the Presence of Many Weak Instruments*, Baltimore, USA

Invited Presentations: Local, Regional, & State

- 2019 CTSI Seminar Series, *Analysis of the Mediated Effect of Air Quality Policies on Low Birthweight Outcomes*, University of Rochester, Rochester, USA
- 2019 NIEHS Environmental Health Sciences Center, *Mediation analysis with multiple treatments and time-varying mediators: Application in a study of birth outcome and ambient pollution concentrations*, University of Rochester, Rochester, USA

Invited Presentations: National & International

- 2009 Statistical Society of Canada (SSC), *Comparing Approaches to Causal Inference for Longitudinal Data: GPS vs IPTW*, Vancouver, Canada
- 2010 Johns Hopkins School of Public Health, *Semiparametric Efficiency of Propensity Score Adjustment*, Baltimore, USA
- 2011 University of Michigan, *Variable Selection in Causal Inference*, Ann Arbor, USA
- 2012 Statistical Society of Canada (SSC), *Double Bias*, Guelph, Canada
- 2012 The Methodology Center, Penn State University, High Dimensional Confounder Selection, State College, USA
- 2013 Department of Biostatistic, Columbia University, *Estimation of Causal Effects from Length-Biased Samples in the Presence of Confounding*, New York, USA
- 2017 CMStatistics, *Selective inference for effect modification*, London, UK
- 2018 International Society for Clinical Biostatistics, *Selective inference for dynamic treatment regimes using the LASSO*, Melbourne, Australia.
- 2018 Langenhop Lecture and SIU Conference in Statistics and Probability, *Sensitivity Analysis and Power in the Presence of Many Weak Instruments*, Carbondale, USA.
- 2018 McGill University, Precision medicine in high-dimensional settings, Montreal, Canada
- 2019 Joint Statistical Meetings, *Trend-in-Trend research design*, Denver, USA.
- 2019 University of Waterloo, *Robust Q-learning*, Waterloo, Canada.
- 2019 CMStatistics, *TBA*, London, UK
- 2020 Columbia University, *TBA*, New York, USA
- 2020 Joint Statistical Meetings, *TBA*, Philadelphia, USA.

PUBLICATIONS

* denotes trainee / supervisee

Peer-Reviewed Journal Articles

1. Sun, H., Lu, X., **Ertefaie, A.**, Johnson, B. (2021) Improved Doubly Robust Estimation in
2. Marginal Mean Models for Dynamic Regimes, *Journal of Causal Inference*, in press.
3. Yaeger, J. P., Jones, J., **Ertefaie, A.**, Caserta, M. T., van Wijngaarden, E., & Fiscella, K. (2021). Using Clinical History Factors to Identify Bacterial Infections in Young Febrile Infants. *The Journal of Pediatrics*.
4. **Ertefaie A**, McKay J. R., Oslin D., and Strawderman R. L. (2020). Robust Q-Learning. *Journal of the American Statistical Association*, to appear.
5. **Ertefaie, A.**, Hsu, J., Nguyen, A., Hardin, D., Morenoff, J., and Small, D. (2019+), Sensitivity Analysis and Power in the Presence of Many Weak Instruments: Application to the Effect of Incarceration on Future Earnings. *Journal of the American Statistical Association*. (tentatively accepted)
6. Witthaus, MW., Farooq, S., Melnyk, R., Campbell, T., Saba, P., Mathews, E., Ezzat, B., **Ertefaie, A.**, Frye, TP., Wu, G., Rashid, H. (2019). Incorporation and Validation of Clinically Relevant Performance Metrics of Simulation (CRPMS) into a Novel Full-immersion Simulation Platform for Nerve-sparing Robot-assisted Radical Prostatectomy using Three-dimensional Printing and Hydrogel Molding Technology. *BJU international*.
7. Dasgupta, N, Schwarz, J., Hennessy, S., **Ertefaie, A.**, Dart, R. C. (2019) Causal inference for evaluating prescription opioid abuse using trend-in-trend design. *Pharmacoepidemiology and Drug Safety*, 28(5), 716-725.

3. **Ertefaie, A.**, and Strawderman, R. L. (2018), Constructing dynamic treatment regimes over indefinite time horizons. *Biometrika*, 105(4), 963-977.
4. **Ertefaie, A.**, Nguyen, A., Harding, D., Morenoff, J., and Yang, W. (2018), Instrumental Variable Analysis with Censored Data in the Presence of Many Weak Instruments: Application to the Effect of Being Sentenced to Prison on Time to Employment. *Annals of Applied Statistics*, 12(4), 2647-2673.
4. Artman, W. J.*, Nahum-Shani, I., Wu, T., McKay, J. R., and **Ertefaie, A.** (2018). Power analysis in a SMART design: sample size estimation for determining the best embedded dynamic treatment regime. *Biostatistics*. <https://doi.org/10.1093/biostatistics/kxy064>
5. **Ertefaie, A.**, Hsu, J., and Small, D. (2018), Discovering Treatment Effect Heterogeneity through Post-treatment Variables with Application to the Effect of Class Size on Math Scores. *Journal of the Royal Statistical Society: Series C*, 67(4), 917-938.
6. **Ertefaie, A.**, Small, D. S., Ji, X., Leonard, C., and Hennessy, S. (2018). Statistical Power for Trend-in-trend Design. *Epidemiology*, 29(3), e21-e23.
7. Kaufman, E. J., **Ertefaie, A.**, Small, D. S., Holena, D. N., and Delgado, M. K. (2018). Comparative Effectiveness of Initial Treatment at Trauma Center vs Neurosurgery-Capable Non-Trauma Center for Severe, Isolated Head Injury. *Journal of the American College of Surgeons*, 226(5), 741-751.
8. **Ertefaie, A.**, Small, D., and Rosenbaum, P. (2017), Quantitative Evaluation of the Trade-off of Strengthened Instruments and Sample Size in Observational Studies. *Journal of the American Statistical Association*, 113(523), 1122-1134.
9. **Ertefaie, A.**, Asgharian, M. and Stephens, A. D. (2017), Variable Selection in Causal Inference using a Simultaneous Penalization Method. *Journal of Causal Inference*, 6(1).
10. Shortreed, S., and **Ertefaie, A.** (2017), Outcome-adaptive Lasso Variable Selection for Causal Inference. *Biometrics*, 73(4), 1111-1122.
11. **Ertefaie, A.**, Flory, J. H., Hennessy, S., and Small, D. (2017), Instrumental Variable Methods for Continuous Outcomes that Accommodate Non-ignorable Missing Baseline Values. *American Journal of Epidemiology*, 185(12), 1233-1239.
12. **Ertefaie, A.**, Small, D., Flory, J. H., and Hennessy, S. (2017) A Tutorial on the Use of Instrumental Variables in Pharmacoepidemiology. *Pharmacoepidemiology and Drug Safety*, 26(4), 357-367.
13. Nahum-Shani, I., **Ertefaie, A.**, Lu, X., Almirall, D., Lynch, K. G., McKay, J. R., and Oslin, D. (2017), A SMART Data Analysis Method for Constructing Adaptive Treatment Strategies in Substance Use Disorders. *Addiction*, 112(5), 901-909.
14. **Ertefaie, A.**, Small, D., Flory, J. H., Hennessy, S. (2016) A Sensitivity Analysis to Assess Bias Due to Selecting Subjects Based on Treatment Received, *Epidemiology*, 27, 2, e5-e7.
15. **Ertefaie, A.**, Wu, T., Lynch, K. G., Nahum-Shani, I. (2016) Identifying a Set that Contains the Best Dynamic Treatment Regimes. *Biostatistics*, 17(1), 135-148.
16. **Ertefaie, A.**, Small, D., Flory, J. H., and Hennessy, S. (2016) Selection Bias when using Instrumental Variable Methods to Compare two Treatments but more than two Treatments are Available. *International Journal of Biostatistics*, 12,1, 219-232.
17. **Ertefaie, A.**, Shortreed, S., and Chakraborty, B. (2016), Q-learning Residual Analysis: Application to The Effectiveness of Sequences of Antipsychotic Medications for Patients with Schizophrenia. *Statistics in Medicine*, 35(13), 2221-2234.

18. **Ertefaie, A.**, Asgharian, M. and Stephens, A. D. (2015) Double Bias: Estimation of Causal Effects from Length-Biased Samples in the Presence of Confounding, *International Journal of Biostatistics*, 11, 1, 69-89.
19. **Ertefaie, A.**, Asgharian, M. and Stephens, A. D. (2014). Propensity Score Estimation in the Presence of Length-biased Sampling: A Non-parametric Adjustment Approach. *Stat*, 3(1), 83-94.
20. **Ertefaie, A.** and Stephens, A. D. (2010). Comparing Approaches to Causal Inference for Longitudinal Data: Inverse Probability of Treatment Weighting versus Propensity Scores, *International Journal of Biostatistics*, 6, 2.
21. **Ertefaie, A.** and Parsian A. (2005). Bayesian Inference for the Pareto Income Distribution under Asymmetric LINEX Loss Function, *Journal of the Iranian Statistical Society*, 4(2), 113-133

Letters, Editorials, & Other Publications

1. Zhao, Q., Small, D. S., and **Ertefaie, A.** Selective inference for effect modification via the lasso, *arXiv preprint arXiv:1705.08020* (revision submitted to *JRSS-B* as a discussed paper).