

# JENNIFER E. STARLING

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<https://jestarling.github.io>

## RESEARCH INTERESTS

Developing flexible Bayesian models for data with complex structure, non-parametric regression, and causal inference. Applications in biostatistics, precision medicine, clinical decision support, and public health.

## EDUCATION

THE UNIVERSITY OF TEXAS AT AUSTIN

PhD, Statistics, May 2020. NIH Biomedical Big Data Fellow.

Dissertation: Bayesian methods for complex data structures, with applications to precision medicine in women's healthcare.

TEXAS A&M UNIVERSITY

MS, Statistics, 2016. Concentration in Biostatistics.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

BS, Mathematics, concentration in Computer Science. (2006)

BA, Theatre Arts, concentration in Management and Lighting Design. (2006)

HIGHLIGHTED AREAS OF STUDY:

Bayesian hierarchical modeling. BART and related methods. Computational statistics. Latent variable modeling. Convex optimization and sparse matrix methods. Spatial smoothing. Dynamic linear models. Variational autoencoders. Bayesian nonparametrics. Bioinformatics and genomics. Design of experiments.

## PUBLICATIONS

Abigail R.A. Aiken, **Jennifer E. Starling**, Rebecca Gomperts, Mauricio Tec, James G. Scott, Catherine E. Aiken. Demand for Self-Managed Online Telemedicine Abortion in the United States During the Coronavirus Disease 2019 (COVID-19) Pandemic. *Obstetrics & Gynecology*, July 2020.

Deshpande, S.K., Bai, R., Balocchi, C., and **Starling, J.E.** VC-BART: Bayesian trees for varying coefficients. Under review, 2020. Preprint at arXiv:2003.06416.

**Jennifer E. Starling**, Catherine E. Aiken, Jared S. Murray, Annetee Nakimuli, James G. Scott. Monotone function estimation in the presence of extreme data coarsening: Analysis of pre-eclampsia and birth weight in urban Uganda. Under review, 2020.

**Jennifer E. Starling**, Jared S. Murray, Carlos M. Carvalho, Radek Bukowski, James G. Scott. BART with Targeted Smoothing: an analysis of patient-specific stillbirth risk. *Annals of Applied Statistics*, 2020, Vol. 14, No. 1, 28-50.

**Jennifer E. Starling**, Jared S. Murray, Patricia A. Lohr, Abigail R.A. Aiken, Carlos M. Carvalho, James G. Scott. Targeted Smooth Bayesian Causal Forests: An analysis of heterogeneous treatment effects for simultaneous versus interval medical abortion regimens over gestation. Under review, 2019. Preprint at arXiv:1905.09405.

Annetee Nakimuli, **Jennifer E. Starling**, Sarah Nakubulwa, Imelda Namagembe, Musa Sekikubo, Eve Nakabembe, James G. Scott, Ashley Moffett, Catherine E. Aiken. Relative impact of pre-eclampsia on birth

weight in a low resource setting: A prospective cohort study. *Pregnancy Hypertension* 21 (2020) 1-6.

Abigail R.A. Aiken, Kathleen Broussard, Dana M. Johnson, Elisa Padron, **Jennifer E. Starling**, James G. Scott. Knowledge, interest, and motivations surrounding self-managed medication abortion among patients at three Texas clinics. *American Journal of Obstetrics and Gynecology*, 2020.

Abigail R.A. Aiken, **Jennifer E. Starling**, Alexandra van der Wal, Sacha van der Vilet, Kathleen Broussard, Dana Johnson, Elisa Padron, James G. Scott. Demand for Self-Managed Early Medication Abortion Using Online Telemedicine in the United States. *American Journal of Public Health*, Dec 2019, e1-e8.

Patricia A. Lohr, **Jennifer E. Starling**, Abigail R.A. Aiken, James G. Scott. Simultaneous Compared With Interval Medical Abortion Regimens Where Home Use is Restricted. *Obstetrics & Gynecology*, April 2018.

## HONORS AND AWARDS

Biomedical Big Data Science Fellow, National Institutes of Health, 2018-2020.

Student Paper Award, Section on Bayesian Statistical Science, Joint Statistical Meetings, 2020.

Young Investigator Award, Section on Epidemiology, Joint Statistical Meetings, 2020. (*declined*)

Student Paper Award, ICSA Applied Statistics Symposium, 2019.

Thomas R. Ten Have Award, Atlantic Causal Inference Conference, 2018.

## SOFTWARE

R package *tsbcf*, implements Bayesian Causal Forests with Targeted Smoothing.

R package *tsbart*, implements BART with Targeted Smoothing and Projective Smooth BART.

Shiny app for stillbirth risk analysis, <https://jestarling.shinyapps.io/stillbirth-risk-with-tsbart/>.

Shiny app for early medical abortion analysis, <https://jestarling.shinyapps.io/ema-with-tsbcf/>.

## PROFESSIONAL MEMBERSHIPS

The American Statistical Association, since 2012.

The International Society of Bayesian Analysis, since 2018.

International Chinese Statistical Association, since 2018.

## TALKS AND PRESENTATIONS

Interpretable Machine Learning for Clinical Decision Support. Decision Sciences Seminar, Foundation Medicine, Boston MA, 2020.

Targeted Smooth Bayesian Causal Forests: An analysis of heterogeneous treatment effects for simultaneous versus interval medical abortion regimens over gestation. Seminar, Mathematica Policy Research, Cambridge MA, 2020.

Smooth extensions to BART for heterogeneous treatment effect estimation, with applications to women's healthcare practice and policy. Causal Inference Program Opening Workshop, Statistical and Applied Mathematical Sciences Institute, Durham NC, 2019.

Smooth extensions to BART, with applications to women's healthcare practice and policy. Seminar Series, Department of Statistics and Data Sciences, The University of Texas at Austin 2019.

Smooth extensions to BART, with applications to women's healthcare practice and policy. Statistics Seminar, School of Mathematics and Statistics, Arizona State University, 2019.

Advances in nonparametric methods in causal inference. Topic-contributed talk, Joint Statistical Meeting, 2019.

BART with Targeted Smoothing: an analysis of patient-specific stillbirth risk. Student Paper Award talk, ICSA Applied Statistics Symposium, 2019.

Bayesian Causal Forests with Targeted Smoothing: an application to family planning protocols. ICSA Applied Statistics Symposium, 2019.

Bayesian Causal Forests with Targeted Smoothing for time-varying heterogeneous treatment effects. Thomas R. Ten Have talk, Atlantic Causal Inference Conference, 2019.

Functional response regression with funBART: an analysis of patient-specific stillbirth risk. Invited talk, ISBA, 2018.

Functional BART for Causal Inference. Poster, Atlantic Causal Inference Conference, 2018.

## **EMPLOYMENT**

### **THE UNIVERSITY OF TEXAS AT AUSTIN**

NIH Biomedical Big Data Fellow. 2018-current.

Graduate Research Assistant, James G Scott. (2017 - 2019)

Graduate Research Assistant, Radek Bukowski, Womens Health, Dell Medical School. (2017)

Graduate Teaching Assistant. (2016-2017)

### **UBS**

Analyst, Financial Reporting. (2010 - 2016)

Designed financial reporting and accounting software to meet public companies regulatory reporting requirements for equity compensation (FASB, SEC, IASB, and more). Projects include risk analysis, forecasting, earnings per share reporting, deferred tax, and expense reporting, with custom work for Fortune 500 companies. Led on-site and remote education courses, lectures, and sales demonstrations. Organized annual user conference.

### **TRANSCENTIVE**

Financial Reporting Product Manager. (2008 - 2010)

Led financial reporting software development process, including research and technical requirements design, client collaborations, and managing end-to-end development lifecycle.

### **FACTSET RESEARCH SYSTEMS**

Consultant. (2007 - 2008)

Consulting, training, and custom solutions for quantitative portfolio managers with healthcare focus.

### **ECHO HOSE AMBULANCE**

Emergency medical technician, Shelton, CT. (2006 - 2013)

Special Olympics Connecticut volunteer medical team. (2007 - 2013)

## **TECHNICAL SKILLS**

R and RStudio (including Rcpp, Armadillo, tidyverse, ggplot, Bioconductor, package development), Python (including numpy, scipy, pandas, scikit-learn), C++, SQL, Github, data visualization, Bash scripting, super-computer automation and parallelization, relational databases, Microsoft Office.