Jette Henderson

✉ jette.henderson@gmail.com
ejette.github.io

Education

2015–2018 **PhD, Computational Sciences, Engineering, and Mathematics**, *The University of Texas at Austin*, Austin, TX.

Learning and Validating Clinically Meaningful Phenotypes from Electronic Health Data

Dissertation Description: Methods to extract computational phenotypes through tensor factorization and automatically validate them using publicly available medical literature.

Advisor: Joydeep Ghosh

2011–2014 **MS, Computational Sciences, Engineering, and Mathematics**, *The University of Texas at Austin*, Austin, TX.

Advisor: Dewayne Perry

GPA: 3.86/4.0

2008–2009 **Post-Baccalaureate Certificate, Mathematics**, *Smith College*, Northampton, MA.

GPA: 3.96/4.0

2004–2008 **BA, Mathematics**, *The Colorado College*, Colorado Springs, CO.

GPA: 3.94/4.0

Honors: Magna Cum Laude, Distinction in Mathematics

Professional Experience

1/20–Present **Senior Machine Learning Research Scientist**, *CognitiveScale*, Austin, TX.

Currently leading company research agenda in fairness, explainability, and transparency in machine learning.
Integrated research into Certifai, a product that scans and monitors machine learning models along the key axes of fairness, robustness, and performance and provides explainability through counterfactual explanations.
Identified biases in black-box models by implementing multiple algorithms, including GANs, that transform underprivileged groups to privileged groups, allowing users to compare model outcomes.
Researched, coded, and tested methods to detect feature drift in a production environment.
Prototyped an approach to estimate model prediction performance without access to data labels in the possible presence of covariate drift.
Proposed and implemented counterfactual explanation generation process for univariate time series classification models.
Developed a federated recommender system that minimizes communication steps while delivering recommendations with differentially private guarantees.
Created an exemplar-based method to visually characterize and understand data drift.
Organized and led summer machine learning internships for graduate students and mentored three students on research projects in fairness and explainability.

10/18–12/19 **Machine Learning Research Scientist**, *CognitiveScale*, Austin, TX.

Developed and published a genetic-algorithm-based counterfactual explanation generation method called CERTIFAI that aims to help machine learning developers assess the robustness, fairness, and explainability of their models.
Introduced a novel fairness metric using CERTIFAI for diagnosing individual and global bias.
Led a team of five developers and machine learning engineers to turn CERTIFAI from a research paper into a commercial product called Certifai.
Jointly optimized fairness and model performance metrics using Bayesian Optimization.
Coordinated the summer machine learning research intern program and mentored five graduate students on a variety of research projects.

Summer 2016 **Data Science Intern**, *Accordion Health*, Austin, TX.

Extracted and aligned patient medication records to analyze fill patterns and prevent lapses in medication adherence.
Built models to predict which patients will fill medications in a set amount of time.

6/14–8/15 **Data Mining Expert**, *Applied Research Laboratories*, Austin, TX.

Developed, implemented, and tested data mining algorithms in Python and Java with applications in network security.
Created an approach to jointly model topics and social networks.

Summer 2013 **Fellow**, *Data Science for Social Good Fellowship at the University of Chicago*, Chicago, IL.

Engaged with non-technical stakeholders to understand the technical problems they face and worked with them towards solutions.
Performed exploratory statistical analysis, data visualization, and data cleaning on large education and transportation data sets.

Selected Publications & Proceedings

Tina Han, Pedram Akbarian, Joydeep Ghosh, and Jette Henderson. Improving Counterfactual Explanations for Time Series Classifications Models in Healthcare Settings. *NeurIPS 2022 Workshop on Learning from Time Series for Health*, 2022 (to appear).

Mónica Ribero, Jette Henderson, Sinead Williamson, and Haris Vikalo. Federating Recommendations Using Differentially Private Prototypes. *Pattern Recognition*, 2022.

Sinead Williamson and Jette Henderson. Understanding Collections of Related Datasets Using Dependent MMD Coresets. *Information*, 2021.

Shubham Sharma, Jette Henderson, and Joydeep Ghosh. CERTIFAI: A Common Framework to Provide Explanations and Analyse the Fairness and Robustness of Black-box Models. *AAAI/ACM Conference on AI, Ethics, and Society (AIES)*, 2020.

Jette Henderson, Joyce C. Ho, Abel N. Kho, Joshua C. Denny, Bradley A. Malin, Jimeng Sun, and Joydeep Ghosh. CP Tensor Decomposition with Cannot-Link Intermode Constraints. *SIAM International Conference on Data Mining*, 2019.

Huan He, Jette Henderson, and Joyce C. Ho. SGranite: Distributed Tensor Decomposition for Large Scale Health Analytics. *The Web Conference 2019 (WWW)*, 2019.

Awards & Honors

Recipient of Honorable Mention for the AMIA Doctoral Dissertation Award (2019)

Winner of Best Student Paper at the KDD Workshop on Machine Learning for Medicine and Healthcare (2018)

Recipient of Distinguished Clinical Research Informatics Paper Award at the AMIA Joint Summits on Translational Sciences (2017)

NIMS Fellowship, four-year fellowship supporting doctoral research, UT Austin (2011–2015)