

# Jette Henderson

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## Education

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

## Publications & Proceedings

- 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 (to appear).
- Huan He, Jette Henderson, and Joyce C Ho. SGranite: Distributed Tensor Decomposition for Large Scale Health Analytics. *The Web Conference 2019 (WWW)*, 2019 (to appear).
- Jette Henderson, Joyce C. Ho, Bradley A. Malin, and Joydeep Ghosh. PIVETed-Granite: Computational phenotypes through constrained tensor factorization. *KDD Workshop on Machine Learning for Medicine and Healthcare*, 2018. **Winner of Best Student Paper.**
- Jette Henderson, Huan He, Bradley A. Malin, Joshua C. Denny, Abel N. Kho, Joydeep Ghosh, and Joyce C Ho. Phenotyping through Semi-Supervised Tensor Factorization (PSST). *AMIA Annual Symposium*, 2018.
- Jette Henderson, Junyuan Ke, Joyce C. Ho, Byron C. Wallace, and Joydeep Ghosh. PIVET: A Scaled Phenotype Evidence Generation Framework using Online Medical Literature. *Journal of Medical Internet Research (JMIR)*, 2018.
- Jette Henderson, Joyce C. Ho, Abel N. Kho, Joshua C. Denny, Bradley A. Malin, Jimeng Sun, and Joydeep Ghosh. Granite: Diversified, Sparse Tensor Factorization for Electronic Health Record-based Phenotyping. In *Proceedings of 5th IEEE International Conference on Healthcare Informatics (ICHI)*, 2017.
- Jette Henderson, Joyce C. Ho, and Joydeep Ghosh. gamAID: Greedy CP Tensor Decomposition for Supervised Electronic Health Record-based Disease Trajectory Differentiation. In *Proceedings of 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, 2017.

Jette Henderson, Ryan Bridges, Joyce C. Ho, Byron C. Wallace, and Joydeep Ghosh. PheKnow-Cloud: A Tool for Evaluating High-Throughput Phenotype Candidates using Online Medical Literature. In *Proceedings of American Medical Informatics Association (AMIA) Joint Summits on Translational Sciences*, 2017. **Recipient of the 2017 Distinguished Clinical Research Informatics Paper Award.**

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Matias I. Hurtado, Jette Henderson, and Joydeep Ghosh. Evaluating Differences Between MIMIC II and III Critical Care Databases. Poster at *American Medical Informatics Association (AMIA) 2016 Annual Symposium*, 2016.

Ryan Bridges, Jette Henderson, Joyce C. Ho, Byron C. Wallace, and Joydeep Ghosh. Automated Verification of Phenotypes using PubMed. In *Proceedings of ACM BCB Workshop on Methods and Applications in Healthcare Analytics*, 2016.

Jette Henderson, Daniel Frazee, Nick Siegel, Cheryl Martin, and Alexander Liu. Evaluating Methods for Distinguishing Between Human-Readable Text and Garbled Text. In *Proceedings of The Florida Artificial Intelligence Research Society (FLAIRS)*, 2016.

Jette Henderson, Joyce C. Ho, Joydeep Ghosh, Suriya Gunasekar, and Jimeng Sun. Personalized Diversified Tensor Factorization for Phenotyping. In *Neural Information Processing Systems (NIPS) 2015 Workshop on Machine Learning in Healthcare*, 2015.

Ayan Acharya, Dean Teffer, Jette Henderson, Marcus Tyler, Mingyuan Zhou, and Joydeep Ghosh. Gamma Process Poisson Factorization for Joint Modeling of Network and Documents. In *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD)*, pages 283–299, 2015.

Jette Henderson and Dewayne E. Perry. Exploring Issues in Software Systems Used and Developed by Domain Experts. In *5th International Workshop on Software Engineering for Computational Science and Engineering (SE-CSE 2013), 35th International Conference on Software Engineering (ICSE 2013)*, pages 96–99, 2013.

Emma Schlatter, Jette Henderson, Sarah Rathnam, and Emily Gunawan. Unfolding Convex Polyhedra. In *Joint Meetings of the American Mathematical Society and Mathematical Association of America (JMM)*, 2009.

Jette Henderson and Megan Flink. The Frobenius Level Problem for Certain Infinite Families of Sets. In *Joint Meetings of the American Mathematical Society and Mathematical Association of America (JMM)*, 2008.

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## Professional Experience

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

Present Pursuing original research in fair machine learning for healthcare and recommendation systems. Investigating current approaches to building automated decision making systems in an ethical, transparent, and accountable manner. Developing plan to implement ethical machine learning techniques into the company's business processes.

Summer 2018 **Machine Learning Intern**, *CognitiveScale*, Austin, TX.

Designed and implemented methods to analyze the fairness and bias of decisions made via machine learning processes.

Contributed to efforts to develop causal models for evaluating counterfactual fairness and implemented solutions in python.

- Summer 2016 **Data Science Intern**, *Accordion Health*, Austin, TX.  
 Extracted and aligned patient medication records in order 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 **Engineering Scientist, Data Mining Expert**, *Applied Research Laboratories*, Austin, TX.  
 Developed, implemented, and tested data mining algorithms in Python and Java with applications in network security.  
 Collaborated with graduate students at the University of Texas at Austin to jointly model topics and social networks.
- Summer 2013 **Fellow**, *Data Science for Social Good Fellowship at the University of Chicago*, Chicago, IL.  
 Actively engaged with stakeholders to understand the problems they face and to propose solutions.  
 Contributed as part of a small team of Fellows to tackle problems in education and transportation.  
 Performed exploratory statistical analysis, data visualization, and data cleaning on large education and transportation data sets using R, Python, and MySQL.  
 Built logistic model with an autoregressive structure to predict whether a bike station in a bikeshare system is full after a given amount of time.
- 1/10–5/11 **Research Assistant and Programmer**, *Mathematica Policy Research, Inc.*, Washington, DC.  
 Performed diagnostic analysis of health insurance claims data in SAS to examine health care cost trends in the state of Massachusetts.  
 Contributed to an education project by using Stata to clean, analyze, and merge student data.  
 Effectively managed a multi-district and -state study conducted for the Department of Education by preparing monthly progress reports and expenditure analyses, verifying the status of study participants, and initiating payments to study participants.

## Academic Experience

- 08/11–Present **Graduate Student Researcher**, *The University of Texas at Austin*, Austin, TX, Advisors: Dr. Joydeep Ghosh and Dr. Dewayne Perry.  
 Developed unsupervised, supervised, semi-supervised methods that utilize tensor factorization to extract sparse and diverse computational phenotypes from patient-level data contained in electronic health records.  
 Built tool that leverages publicly available medical articles to generate evidence sets for candidate phenotypes extracted in a high-throughput manner.  
 Built an optimized influenza surveillance network for the United States using data from Influenza-Like Illness Network (ILInet), linear regression, and a variety of optimization techniques.  
 Designed survey to study issues that domain experts encounter when they develop software.
- 09/08–12/08 **Student Researcher**, *Smith College*, Northampton, MA, Advisor: Dr. Joseph O'Rourke.  
 Designed an algorithm to unfold convex polyhedra flat without overlap.  
 Collaborated with a group of student researchers to generate ideas and approaches to the problem.
- Summer 2008 **Student Researcher and Programmer in Atmospheric Science**, *Colorado State University*, Fort Collins, CO, Advisor: Dr. David Randall.  
 Developed and implemented an algorithm in Mathematica to calculate an approximation to the Laplacian operator on a twisted icosahedral grid.
- 10/07–05/08 **Student Researcher**, *The Colorado College*, Colorado Springs, CO, Advisor: Dr. David Brown.  
 Modeled the initiation of cancer via two mutations using stochastic processes and differential equations.  
 Implemented stochastic simulations in Mathematica and compared data with results from analytic models.

Summer 2007 **REU Participant**, *Willamette University*, Salem, OR, Advisors: Dr. Inga Johnson and Dr. Colin Starr.

Engaged as part of a team of researchers to analyze the Frobenius Level Problem.  
Developed an algorithm to solve Frobenius Level Problem for certain infinite families of sets.

Summer 2006 **REU Participant**, *The University of Texas at Austin*, Austin, TX, Advisor: Dr. Eric Anslyn.

Synthesized secondary and primary amino-boronic acids and performed experiments with synthesized molecules to observe intermolecular interactions.

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## Teaching Experience

8/13–12/13 **Teaching Assistant**, *The University of Texas at Austin*, Austin, TX, Numerical Linear Algebra.

4/05–05/08 **Writing Consultant**, *The Colorado College Writing Center*, Colorado Springs, CO.

Assisted students in writing development and in creatively solving conceptually difficult problems.  
Practiced attentive listening and critical reasoning to aid students in their writing development.  
Trained other students to become effective Writing Center consultants.

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## Awards & Honors

Awards 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 (2011–2015)

Post-Baccalaureate Women in Mathematics Fellowship (2008–2009)

Dean's List, The Colorado College (2004–2008)

Distinction in Mathematics, The Colorado College (2008)

Champion Award for Achievement in Organic Chemistry, The Colorado College (2005)

Winner of First Year Experience Essay Contest, The Colorado College (2004)

Honors Phi Beta Kappa

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## Skills

R, Python, Java, MongoDB, MySQL, Stata, SAS, Git, Eclipse