

Amy M. Crawford

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EDUCATION	Iowa State University Ames, IA Ph.D., Statistics, in progress <i>August 2015 - present</i> <i>Major Professors:</i> Alicia Carriquiry, Danica Ommen <i>Expected Graduation:</i> May 2020 <i>Oral Preliminary Examination:</i> Passed Fall 2019 M.S., Statistics, August 2017 <i>Major Professor:</i> Stephen B. Vardeman North Dakota State University Fargo, ND B.S., Mathematics and Statistics, May 2015 <i>September 2011 - May 2015</i> Actuarial Emphasis <i>Magna Cum Laude</i> Actuarial Exam P, Passed <i>November 2013</i>
RESEARCH INTERESTS	Statistical evaluation of forensic pattern evidence, Bayesian statistics, adaptive clinical trial design, hierarchical modeling, machine learning, interpretability of complex models,
HONORS & AWARDS	<i>First Prize, Springer Poster Competition</i> , 10th International SimStat Workshop September 2019 <i>YFSF Best Poster Award</i> , American Academy of Forensic Sciences February 2018 <i>Presidential Graduate Scholar Award</i> , Iowa State University Fall 2015 - Spring 2017 <i>Honor Society Member</i> , Phi Kappa Phi, North Dakota State University Chapter Fall 2014 - Spring 2015 <i>H.P. Kuang Scholarship in Statistics</i> , Dept. of Statistics, ND State University Awarded Fall 2013
LEADERSHIP EXPERIENCE	Executive Board Member, Iowa State STATCOM <i>Fall 2018 - present</i> Help to lead projects in the Iowa State chapter of STATCOM (STATistics in the COMMunity), a graduate student organization that provides free statistical consulting to local community focused organizations. President, Iowa State STATers <i>Fall 2018 - Spring 2019</i> General management and planning for the graduate student organization. Liaised with the Department Chair and Committees. Kept the organization in good standing with the University and as an ASA Student Chapter. Coordinated the prospective student group visit day. Vice President, Iowa State STATers <i>Fall 2017 - Spring 2018</i> Provided students with academic and professional growth opportunities. Connected students and faculty with similar research interests. Coordinated student focused seminars and on-campus interviews with companies.

INTERNSHIP EXPERIENCE	Berry Consultants	Austin, TX
	<i>Statistical Scientist Intern</i>	<i>May 2019 - August 2019</i>
	Bayesian approach to the design and analysis of adaptive clinical trials.	
	John Deere Financial	Johnston, IA
	<i>Risk Analytics Intern</i>	<i>May 2016 - August 2016</i>
	Investigate and predict fraudulent behavior on a revolving credit product using transaction data with extreme class imbalance and an element of “covariate shift” between training and testing data.	
TEACHING EXPERIENCE	Iowa State University	Ames, IA
	<i>Instructor, Principles of Statistics</i>	<i>Fall 2016, Spring 2017, Fall 2017</i>
	<ul style="list-style-type: none"> – Lectured three times weekly to a class of 100-120 students. – Developed course slides and document style notes. – Wrote and graded in-class exams and quizzes. 	
	North Dakota State University	Fargo, ND
	<i>Teaching Assistant, College Algebra</i>	<i>Fall 2014</i>
	<ul style="list-style-type: none"> – Led weekly recitation sessions – Prepared weekly exercise problem sets – Graded exams 	
	<i>Teaching Assistant, Introduction to Statistics</i>	<i>Fall 2014, Spring 2015</i>
	<ul style="list-style-type: none"> – Prepared homework and in-class exercises and exam questions. – Provided in-class support while students completed exercises. – Held office hours. 	
	<i>Tutor/Supervisor</i>	<i>Fall 2013 to Spring 2015/ Fall 2014, Spring 2015</i>
	<ul style="list-style-type: none"> – Use the Socratic method to help students study and learn course material in upper level mathematics and statistics courses. – Tutored: calculus I-III, real analysis, numerical analysis, advanced economics, mathematical statistics, design of experiments, etc. – Supervised a team of more than 40 tutors in the center. Involved in interviewing, training, and scheduling. 	
RESEARCH EXPERIENCE	Iowa State University	Ames, IA
	<i>Graduate Research Assistant, CSAFE</i>	<i>August 2017 - present</i>
	<p>Research: Work at the Center for Statistics and Applications in Forensic Evidence (CSAFE) on methods for a statistical approach to handwriting analysis under the supervision of Dr. Alicia Carriquiry.</p> <p>Outreach: Develop materials to teach non-statistical audiences statistical concepts that are useful in forensic science. See “Community Engagement” section below.</p>	

University of Minnesota

Minneapolis, MN

*Summer Institute in Biostatistics**May 2014 - August 2014*

Residential summer course in biostatistics with focus on mathematics,
statistics, computing, and public health research.

PAPERS

In Review

Berry, N., and **Crawford, A.** “A Clustering Method for Graphical Handwriting Components and Statistical Writership Analysis”. In Review for the Annals of Applied Statistics in September 2019.

Submitted

Ray, A., **Crawford, A.**, and Carriquiry, A.. *A Database of Handwriting Samples for Applications in Forensic Statistics*. Submitted to Data in Brief.

In Preparation

Crawford, A., Carriquiry, A., and Ommen, D.. *Bayesian Hierarchical Modeling for Forensic Handwriting Analysis*. In preparation for submission to Proceedings of the National Academy of Sciences.

Crawford, A., Berry, S., and collaborators. *Progressive Disease Modeling for Evaluation of Efficacy in Clinical Trials with Ordinal Endpoints*.

CONFERENCE
PRESENTATIONS

Intl. Workshop on Simulation and Statistics

Salzburg, Austria

*Poster Session**September 2019*

“A Bayesian Hierarchical Model for Forensic Writer Identification”

Am. Soc. of Questioned Document Examiners

Cary, NC

*Technical Session**August 2019*

“Statistical Analysis of Handwriting for Writer Identification”

Joint Statistical Meetings

Denver, CO

*Contributed Session**July 2019*

“A Bayesian Hierarchical Mixture Model with Applications in
Forensic Handwriting Analysis”

Am. Academy of Forensic Sciences, Ann. Meeting

Baltimore, MD

*Presentation Session**February 2019*

“An Exploratory Analysis of Handwriting Features: Investigating Numeric
Measurements of Writing that are Important for Statistical Modeling”

Am. Soc. of Questioned Document Examiners

Park City, UT

*Technical Session**August 2018*

“Toward a Statistical and Algorithmic Approach to Forensic
Handwriting Comparison”

Joint Statistical Meetings

Vancouver, BC, Canada

*Topic Contributed Session**July 2018*

“A Bayesian Approach to the Analysis of Handwritten Evidence”

American Bar Association Criminal Justice Section, New York, NY
Prescription for Criminal Justice Forensics Program May 2018
Presentation

“Bringing Statistical Foundations to Forensic Handwriting Analysis”

American Academy of Forensic Sciences, Annual Meeting Seattle, WA
Poster Session February 2018

“Statistical Analysis of Letter Importance for Forensic Document Examination”

NOBCChE Annual Conference Minneapolis, MN
Interactive Forensic Statistics Presentation November 2017

An introduction to forensic pattern evidence and the role that statistics plays in the interpretation of evidence through interactive problems and case studies.

COMMUNITY
ENGAGEMENT

Co-Presenter, Iowa Council of Teachers of Mathematics (ICTM)
Annual Conference October 2019

- A presentation titled “Math, stats, and computer science applications to solve forensic science questions”
- Demonstrate forensic statistics activities for middle and high school students.
- Engage high school math teachers to consider formulation of research questions, data driven decision making, and statistical thinking.

Co-Instructor, STEM InCYte Camp September 2018

- Two half day sessions for Des Moines, IA elementary students.
- Finger and shoe print lab activities followed by statistical thinking in the forensic context and a sampling activity.

Invited Guest Instructor, STEMiversity June 2017, June 2018

- Developed curricula on statistics in forensic evidence for high school students in 2017 (one day) and middle school students in 2018 (two days).
- Teaching through hands-on activities, case studies, and visual analyses.
- This academy serves historically under-represented demographic groups.

Guest Speaker, ISU Learning Community October 2017, October 2018

- Interactive hour long workshops for open-option college students.
- Introduced data and statistics in forensic evidence examination through activities and case studies.

Instructor/Co-Instructor, ScienceBound September 2017, September 2018

- Program that encourages Iowa students of color to pursue STEM fields.
- Two hour sessions of hands-on activities to introduce statistical concepts.

Co-Instructor, Pre-collegiate Adventures Program July 2017

- Developed a week-long curriculum on statistics in forensic science for gifted and talented students from low-income communities entering grades 9–11.

COMPUTING
SKILLS

Expertise: R/RStudio, RCpp, RShiny, L^AT_EX, Markdown, GitHub
Familiarity: Python, SAS, Java, HTML