

## CONTACT INFORMATION

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## EDUCATION

Jan 2016 - Current **Doctor of Philosophy, Statistics**  
Iowa State University, Ames, IA  
Major Professor: Dr. Heike Hofmann  
Research Topic: Visual Diagnostics for Machine Learning Models  
Expected Completion: December 2020

Aug 2013 - May 2015 **Master of Science, Statistics**  
University of Wisconsin, Madison, WI

Sep 2009 - June 2013 **Bachelor of Arts, Mathematics**  
Lawrence University, Appleton, WI  
Graduated Magna Cum Laude  
Senior Capstone: "An Explanation of Double-Error-Correcting BCH Codes"

**Study Abroad**  
Summer 2012 University of Granada, Centro de Lenguas Modernas, Spain  
Fall 2010 Lawrence London Centre, England

Research Interests Model Assessment, Interpretation of Machine Learning Algorithms, Data Visualization, Random Forest Models, Mixed Model Residuals, Generalized Linear Mixed Models, R Package Development

## AWARDS AND HONORS

- 2019 **Midwest Statistical Machine Learning Colloquium Poster Award**  
Awarded for poster "Using LIME to Interpret a Random Forest Model with an Application to Bullet Matching Data"
- 2018 **ISU Department of Statistics Dan Mowrey Consulting Excellence Award**  
Awarded in recognition of outstanding contributions in the area of statistical consulting while working toward a graduate degree.
- 2017 **ISU Department of Statistics Award for Experiential Development**  
Presented to a graduate student for excellent performance in multiple statistical efforts (teaching and consulting) as part of the graduate program.

## WORK EXPERIENCE

May 2018 - Current **Senior Statistical Consultant**  
*Agriculture Experiment Station, Iowa State University*  

- Helped with administrative decisions
- Oversaw organizational tasks for the group
- Mentored and trained new consultants
- Continued with statistical consultant responsibilities

May 2016 - Apr 2018 **Statistical Consultant**

*Agriculture Experiment Station, Iowa State University*

- Provided statistical support on research projects for graduate students, professors, and staff from the colleges of agriculture and life sciences, engineering, human sciences, liberal arts and sciences, and veterinary medicine
- Advised clients on study designs and statistical analysis methods in areas of statistics including linear and generalized linear models, mixed models, data visualization, predictive modeling, multivariate analyses, and Bayesian models
- Assisted with the implementation of analyses in R, SAS, and JMP

Dec 2015 **Data Analyst**

*Research Administration Office, Lawrence University*

- Analyzed data from a study to compare the academic success and mood towards the university of undergraduates from freshman to sophomore years
- Performed statistical analyses using SPSS

**Data Collection Assistant**

Sep 2014 - May 2015 *Research Administration Office, Lawrence University*

- Assisted with the data collection for a study on the evaluation of warning lights installed at a busy crosswalk on the university campus
- Used Tracker software to determine the deceleration rate of vehicles from videos taken of cars approaching the crosswalk

RESEARCH EXPERIENCE

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Dec 2019 - Current **Statistical Sciences Research and Development Internship**

*Sandia National Laboratories*

Assisted with a research project on Bayesian neural networks (BNNs). Focused on visualizations of BNNs for assessment and explanations for prediction. Supervised by Dr. Daniel Ries.

Sep 2017 - Current **PhD Research**

*Iowa State University*

Development of diagnostic tools for the assessment of LIME applied to interpret random forest models. Advised by Dr. Heike Hofmann.

May 2019 - Aug 2019 **Research Assistant**

*Iowa State University*

Computation of profile confidence intervals for dose response curve models. Application to a toxicology study of monarch butterfly larvae exposed to insecticides. Collaborative work with Dr. Steven Bradbury and PhD Student Niranjana Krishnan.

July 2019 **Industrial Math/Stat Modeling (IMSM) Workshop for Graduate Students**

*The Statistical and Applied Mathematical Sciences Institute (SAMSI)*

- Two week research workshop
- Worked in a research group mentored by senior statisticians from Rho Inc.
- Analyzed continuously monitored glucose data using functional data analysis
- Assisted with the writing of a report and presentation on the research analysis

SOFTWARE DEVELOPMENT

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Mar 2017 - Current **ggResidpanel: An R package for easy visualization of model diagnostic plots**

*Iowa State University*

Developed an R package that produces panels of diagnostic plots for one one, panels of plots for comparing multiple models, and interactive versions of the plots. Joint work with Dr. Katie Rey. Source code can be found at <https://goodekat.github.io/ggResidpanel/>.

## PAPERS AND TECHNICAL REPORTS

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Dixon, P.M., Goode, K.J., and Lay, C., 2020, "Profile likelihood confidence intervals for ECx". Statistics Technical Reports. [https://lib.dr.iastate.edu/stat\\_las\\_reports/1](https://lib.dr.iastate.edu/stat_las_reports/1)

Ball, E.E., Goode, K.J., and Weber, M.J., 2019. "Effects of Transport Duration and Water Quality on Age-0 Walleye Stress and Survival", North American Journal of Aquaculture, 82:33–42.

## CONTRIBUTED TALKS

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Goode, K. and Hofmann, H. "Visual Diagnostics of a Model Explainer: Tools for the Assessment of LIME Explanations from Random Forests". Joint Statistical Meetings. July 29, 2019.

Goode, K. "A Review and Discussion of Residuals for Mixed Models". NCCC-170 Meeting. June 20, 2019.

## CONTRIBUTED POSTERS

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Goode, K. and Hofmann, H. "Using LIME to Interpret a Random Forest Model with an Application to Bullet Matching Data", Midwest Statistical Machine Learning Colloquium. May 13, 2019.

Goode, K. and Hofmann, H. "Using LIME to Interpret a Random Forest Model with an Application to Bullet Matching Data", Iowa State University Graduate and Professional Student Research Conference. April 10, 2019.

Goode, K. and Rey, K. "Introducing ggResidpanel: An R Package for Easy Visualization of Residuals". Kansas State University Conference on Applied Statistics in Agriculture. Contributed Poster. May 2018.

## TEACHING EXPERIENCE

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<b>Seminar Leader</b>	Aug 2018 and 2019	<b>Predictive plant phenomics graduate student statistics bootcamp</b> <i>Iowa State University</i> - Led a one day statistics bootcamp - Discussed randomization, confidence intervals, and design of experiments - Prepared slides
<b>Instructor</b>	Spring 2016	<b>STAT 101: Introduction to statistics</b> <i>Iowa State University</i> - Prepared and led lectures - Wrote and graded exams - Topics included summary statistics, visualization, normal distribution, hypothesis testing, confidence intervals, and JMP
	Fall 2015	<b>MATH 107: Elementary statistics</b> <i>Lawrence University</i> - Organized the curriculum - Prepared and graded homework and exams - Topics included summary statistics, visualizations, randomization tests, bootstrap, normal distribution, hypothesis testing, confidence intervals, and R
<b>Teaching Assistant</b>	Spring 2015	<b>BMI 552: Regression methods for population health graduate students</b> <i>UW Madison</i> - Taught labs - Held office hours - Topics included simple and multiple linear regression, logistic regression, survival analysis, and SAS
	Fall 2014	<b>BMI 551: Introduction to biostatistics for population health graduate students</b>

*UW Madison*

- Taught labs
- Held office hours
- Topics included summary statistics, visualizations, probability, normal distributions, hypothesis testing, confidence intervals, and R.

Summer 2014 **STAT 301: Introduction to statistical methods for non-statistics majors**

*UW Madison*

- Prepared and led discussions
- Graded homework and exams
- Held office hours
- Topics included summary statistics, visualizations, probability, normal distributions, hypothesis testing, and confidence intervals

Spring 2014 **STAT 302: Accelerated introduction to statistical methods for statistics undergraduate majors**

*UW Madison*

- Prepared and led discussions
- Graded homework and exams
- Held office hours
- Topics included summary statistics, visualizations, randomization tests, bootstrap, normal distribution, hypothesis testing, confidence intervals, and R

Fall 2013 **STAT 371: Introductory applied statistics for the life sciences**

*UW Madison*

- Prepared and led discussions
- Graded homework and exams
- Held office hours and worked in the statistics help room
- Topics included summary statistics, visualizations, probability, normal distributions, hypothesis testing, confidence intervals, and R

**Mentor** Sep 2014 - **Academic Mentor for Minority and First Generation Undergraduates**

May 2015 *Center for Academic Excellence, University of Wisconsin, Madison*

- Mentored minority and first generation undergraduate students enrolled in statistics courses
- Met weekly throughout the semester with individuals or small groups to review statistical concepts from class and make the material approachable
- Discussed and encouraged strategies for academic success

**Tutor** Fall 2014 - Tutored undergraduate students in various introductory statistics courses at UW  
Spring 2015 Madison

## SERVICE

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Sep 2019 - May 2020 Iowa State statistical graphics working group weekly meeting organizer  
Sep 2018 - May 2019 Graduate student representative to ISU statistics department faculty meetings  
Sep 2017 - May 2019 Recycling coordinator for ISU STATers (Statistics Graduate Student Organization)  
Sep 2017 - May 2019 Treasurer and member of StatCom (Statistics in the Community) at Iowa State

## COMPUTING SKILLS

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Working Knowledge: GitHub, JMP, L<sup>A</sup>T<sub>E</sub>X, R, R Markdown, SAS, Shiny, SPSS  
Basic Knowledge: C, Python