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EDUCATION

Iowa State University (Aug 2018 - Present)
Doctor of Philosophy, Statistics GPA: 3.95/4.0
Dissertation: "A Cartridge Case Comparison Pipeline" under Dr. Heike Hofmann, Department of Statistics

Iowa State University (Aug 2018 - May 2020)
Master of Science, Statistics GPA: 4.0/4.0

Winona State University (Aug 2013 - Dec 2017)
Bachelor of Science, Mathematics & Mathematics: Secondary Education GPA: 3.97/4.0

TEACHING EXPERIENCE

Iowa State University (Sep 2018 - Dec 2022)
Graduate Teaching Assistant

- **Instructor** for STAT 528: Visual Business Analytics, providing Master of Business Analytics students with hands-on experience with data visualization tools and best practices in the R programming language (Approx. 20 students)
- **Instructor** for STAT 226: Introduction to Business Statistics I, fostering a foundational knowledge of statistics for undergraduate students (Approx. 50 students; 4.62/5 average instructor rating from 21 students)
- **Lab Assistant** for STAT 101: Introduction to Statistics and STAT 326: Introduction to Business Statistics II, providing mentorship to undergraduate students in applying statistics to real-world problems (Approx. 100 students)
- **Grader** for STAT 226: Introduction to Business Statistics I, ensuring that students received timely feedback and support in their learning (Approx. 1,000 undergraduate students)

Center for Statistics and Applications in Forensic Evidence (Sep 2022 - May 2022)
Teaching Assistant

- Created 15 quiz and Excel lab assignments for a Forensic Stats 101 asynchronous online course, aimed at introducing forensic practitioners to probability and statistics (Approx. 30 forensic professional students)
- Wrote, proctored, and graded the Forensic Stats 101 final exam, ensuring students had an opportunity to demonstrate their knowledge and mastery of course material
- Developed a practicum for a Sampling for Forensic Practitioners course that included 13 exercises, allowing students to apply concepts from the course to real data using Microsoft Excel (Approx. 70 forensic professional students)
- Produced multimedia videos to enhance the learning experience and improve student engagement with the practicum material
- Participated in course planning and curriculum development, collaborating with colleagues to develop innovative teaching strategies that improved the overall learning experience for students

Blaine High School - Center for Engineering, Mathematics, and Science (Feb 2018 - May 2018)
Long-Term Substitute Mathematics Teacher

- Substituted for a math teacher on paternity leave and taught Honors Pre-Calculus, Geometry, and Intermediate Algebra to approximately 100 high school students
- Developed and delivered engaging lessons, provided feedback on assignments, and fostered a supportive learning environment for students
- Employed various instructional strategies to engage learners and promote student success, including differentiated instruction, cooperative learning, and technology integration
- Monitored student progress and provided regular feedback, utilizing formative and summative assessments to guide instruction and measure student achievement

RESEARCH FOCUS

Pattern recognition and forensic statistics, with an emphasis on firearm and toolmark evidence. Interest in developing statistically-sound and accessible algorithms to objectively compare forensic evidence.

RESEARCH EXPERIENCE

Center for Statistics and Applications in Forensic Evidence (Jan 2020 - Present)
Graduate Research Assistant

- Conduct advanced research on statistical and probabilistic approaches to forensic evidence analysis and evaluation
- Design novel classification algorithms to compare ballistic impression evidence, achieving over 50% reduction in misclassifications compared to state-of-the-art methods
- Present research to academic and professional audiences, and author several papers to be published in peer-reviewed journals
- Provide guidance to undergraduate and graduate students on research projects
- Create interactive web applications using Python and R for forensic practitioners to apply algorithms in casework

WORK EXPERIENCE

Data Science for the Public Good (May 2021 - Aug 2021)
Graduate Fellow

- Led a team of students to identify research priorities and develop strategies to improve public services
- Collaborated with policy experts to understand the implications of the research findings and to propose recommendations
- Utilized web scraping techniques to extract and organize demographic and labor data
- Created visualizations of data analysis results in order to communicate findings clearly and effectively
- Developed interactive web applications for legislators to identify Iowa communities in need of additional language services
- Presented technical reports to communicate research findings to stakeholders at the Iowa Department of Human Rights

John Deere (May 2019 - Aug 2019)
Data Analyst Intern

- Utilized machine learning models to identify patterns in machine usage data and to predict maintenance needs
- Collaborated with cross-functional teams to ensure data accuracy, integrity, and quality
- Managed complex data sets using SQL in a Databricks cloud environment
- Identified data anomalies originating from John Deere-certified dealers which improved the data collection process
- Provided actionable business insights to internal stakeholders through reports and presentations

Kay Tutoring (Jun 2017 - Aug 2018)
Test Prep and Academic Mathematics Tutor

- Developed and delivered customized instruction in mathematics to middle school, high school, and college students with a focus on fundamental concepts and real-world applications
- Prepared high school students for the math sections of the ACT and SAT, utilizing a proprietary curriculum designed to build critical thinking abilities
- Contributed to curriculum development by leveraging pedagogical best practices
- Trained tutors in effective student engagement, curriculum delivery, and assessment methods to optimize learning outcomes

Winona State University (Oct 2013 - May 2017)
Peer Mathematics Tutor

- Provided mathematics tutoring to undergraduate students in subjects ranging from college-level Algebra to Advanced Calculus
- Developed customized instructional materials and exercises to meet the unique learning needs and goals of each student
- Collaborated with university faculty and staff to align peer tutoring services with course objectives and student learning outcomes
- Mentored new peer tutors on effective student engagement, curriculum delivery, and assessment methods

PUBLICATIONS

A Study in Reproducibility: the Congruent Matching Cells method and cmcR package (Mar 2023)
The R Journal

Implements and explores the Congruent Matching Cells algorithm to compare cartridge case evidence in the cmcR R package

🔗 <https://github.com/jzemmels/cmcRWriteUp>

Automatic Matching of Cartridge Case Impressions,
To be submitted to The Journal of Data Science, Statistics, and Visualizations

Introduces the Automatic Cartridge Evidence Scoring (ACES) algorithm to objectively compare two cartridge cases based on impressions left by the firearm during the firing process.

🔗 <https://github.com/jzemmels/jdssvSubmission>

Diagnostic Tools for Cartridge Case Comparison Algorithms
To be submitted to The Journal of Computational and Graphical Statistics

Develops diagnostic tools that allow forensic practitioners and researchers to understand the behavior of automatic cartridge case comparison algorithms.

🔗 <https://github.com/jzemmels/visualDiagnosticsPaper>

SKILLS

Data Visualization
ggplot2, matplotlib, shiny, Tableau, Power BI

Machine Learning
tensorflow, scikit-learn, caret

Data Manipulation
pandas, dplyr, tidyr, rvest, numpy

Data Management
SQL, GitHub, git, Databricks

REFERENCES

Dr. Heike Hofmann
Professor of Statistics (Teaching & Professional Reference)

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