

# Susan Vanderplas

## Curriculum Vitae

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🌐 [srvanderplas](https://srvanderplas.github.io)

### Education

- 2015 **PhD, Statistics**, Iowa State University  
Dissertation: The Perception of Statistical Graphics
- 2011 **MS, Statistics**, Iowa State University
- 2009 **BS, Psychology & Applied Mathematical Sciences**, Texas A&M University

### Professional Experience

- 2020 **Assistant Professor**, *Statistics Department*, University of Nebraska, Lincoln
- 2018–2019 **Research Assistant Professor**, *Center for Statistics and Applications in Forensic Evidence*, Iowa State University
- 2015–2019 **Statistical Analyst/Consultant**, *Nebraska Public Power District*
- 2015 **Postdoc**, *Iowa State University Office of the Vice President for Research*

### Publications

Student advisees indicated with \*. Contribution percentages estimated from git contributions using `git fame` where possible. Not all projects have github repositories for which this is meaningful.

#### Peer Reviewed Publications


- 15. 2022 Zemmels, Joseph\*, **Vanderplas, Susan**, and Hofmann, Heike (2022). “A Study in Reproducibility: The Congruent Matching Cells Algorithm and cmcR package”. In: *R Journal*. Accepted October 2022.  
**Contribution:** Programming and analysis (10%), Writing (20%), Advising (40%).
- 14. 2022 Robinson, Emily A.\*, Howard, Reka, and **Vanderplas, Susan** (2022). “Eye Fitting Straight Lines in the Modern Era”. In: *Journal of Computational and Graphical Statistics* 0.ja, pp. 1–19. DOI: <https://doi.org/10.1080/10618600.2022.2140668>.  
**Contribution:** Programming and analysis (10%), Writing (10%), Advising (60%).
- 13. 2021 Hofmann, Heike, **Carriquiry, Alicia**, and Vanderplas, Susan (May 5, 2021). “Treatment of inconclusives in the AFTE range of conclusions”. In: *Law, Probability and Risk* 19.3-4, pp. 317–364. ISSN: 1470-8396. DOI: <https://doi.org/10.1093/lpr/mgab002>.  
**Contribution:** Writing (50%).
- 12. 2021 **Vanderplas, Susan**, Röttger, Christian, Cook, Dianne, and Hofmann, Heike (Dec. 1, 2021). “Statistical significance calculations for scenarios in visual inference”. In: *Stat* 10.1, e337. DOI: <https://doi.org/10.1002/sta4.337>.  
**Contribution:** Programming and analysis (30%), Writing (65%).
- 11. 2020 Vanderplas, Susan, Carriquiry, Alicia, Hofmann, Heike, Hamby, James, and Tai, Xiao Hui (2020). “An introduction to firearms examination for researchers in statistics”. In: *Handbook of Forensic Statistics*. Ed. by Banks, D., Kafadar, K., Kaye, D., and Tackett, M. New York: Chapman




and Hall/CRC 2020. DOI: <https://doi.org/10.1201/9780367527709>.

**Contribution:** Writing (50%).

10.  2020  
Vanderplas, Susan, Nally, Melissa, Klep, Tylor, Cadevall, Cristina, and Hofmann, Heike (Mar. 1, 2020). "Comparison of three similarity scores for bullet LEA matching". In: *Forensic Science International* 308, p. 110167. ISSN: 0379-0738. DOI: <https://doi.org/10.1016/j.forsciint.2020.110167>. URL: <https://www.sciencedirect.com/science/article/pii/S0379073820300293>.  
**Contribution:** Programming and analysis (20%), Writing (55%).
9.  2020  
**Vanderplas, Susan**, Cook, Dianne, and Hofmann, Heike (Mar. 1, 2020). "Testing Statistical Charts: What Makes a Good Graph?" In: *Annual Review of Statistics and Its Application* 7.1, pp. 61–88. DOI: <https://doi.org/10.1146/annurev-statistics-031219-041252>.  
**Contribution:** Writing (85%).
8.  2019  
Rutter, Lindsay, **Vanderplas, Susan**, Cook, Dianne, and Graham, Michelle (May 29, 2019). "ggenealogy: An R Package for Visualizing Genealogical Data". In: *Journal of Statistical Software* 89.13, pp. 1–31. DOI: <https://doi.org/10.18637/jss.v089.i13>.
7.  2019  
**Vanderplas, Susan**, Goluch, Ryan C, and Hofmann, Heike (Apr. 1, 2019). "Framed! Reproducing and Revisiting 150-Year-Old Charts". In: *Journal of Computational and Graphical Statistics* 28.3, pp. 620–634. DOI: <https://doi.org/10.1080/10618600.2018.1562937>.  
**Contribution:** Programming and analysis (60%), writing (50%).
6.  2018  
Sievert, Carson, **Vanderplas, Susan**, Cai, Jun, Ferris, Kevin, Khan, Faizan Uddin Fahad, and Hocking, Toby Dylan (Nov. 14, 2018). "Extending ggplot2 for Linked and Animated Web Graphics". In: *Journal of Computational and Graphical Statistics* 28.2, pp. 299–308. DOI: <https://doi.org/10.1080/10618600.2018.1513367>.
5.  2017  
**Vanderplas, Susan** and Hofmann, Heike (Apr. 24, 2017). "Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics". In: *Journal of Computational and Graphical Statistics* 26.2, pp. 231–242. DOI: <https://doi.org/10.1080/10618600.2016.1209116>.  
**Contribution:** Programming and analysis (90%), writing (50%).
4.  2016  
**VanderPlas, Susan** and Hofmann, Heike (Dec. 31, 2016). "Spatial Reasoning and Data Displays". In: *IEEE Transactions on Visualization and Computer Graphics* 22.1, pp. 459–468. DOI: <https://doi.org/10.1109/TVCG.2015.2469125>.  
**Contribution:** Programming and analysis (90%), writing (75%).
3.  2015  
**Vanderplas, Susan** and Hofmann, Heike (Dec. 10, 2015). "Signs of the Sine Illusion - why we need to care". In: *Journal of Computational and Graphical Statistics* 24.4, pp. 1170–1190. DOI: <https://doi.org/10.1080/10618600.2014.951547>.  
**Contribution:** Programming and analysis (50%), writing (60%).
2.  2010  
Towfic, Fadi, **Vanderplas, Susan**, Oliver, Casey A, Couture, Oliver, Tuggle, Christopher K, Greenlee, M Heather West, and Honavar, Vasant (2010). "Detection of gene orthology from gene co-expression and protein interaction networks". In: *BMC bioinformatics* 11.Suppl 3, S7. DOI: <https://doi.org/10.1186/1471-2105-11-S3-S7>.
1.  2009  
Hull, Rachel, Bortfeld, Heather, and **Koons, Susan** (2009). "Near-infrared spectroscopy and cortical responses to speech production". In: *The open neuroimaging journal* 3, p. 26. DOI: <https://doi.org/10.2174/1874440000903010026>.

## Other Publications

4.  2021  
*Submitted as an invited response to Hullman & Gelman's "Designing for Interactive Exploratory Data Analysis Requires Theories of Graphical Inference".*  
**VanderPlas, Susan** (July 30, 2021). "Designing Graphics Requires Useful Experimental Testing Frameworks and Graphics Derived From Empirical Results". In: *Harvard Data Science Review* 3.3. DOI: <https://doi.org/10.1162/99608f92.7d099fd0>.

3.  Carriquiry, Alicia, Hofmann, Heike, Tai, Xiao Hui, and **Vanderplas, Susan** (Apr. 1, 2019). "Machine learning in forensic applications". In: *Significance* 16.2, pp. 29–35. DOI: <https://doi.org/10.1111/j.1740-9713.2019.01252.x>.  
**Contribution:** Writing (50%).
2.  Submitted as an invited response to Donoho's "50 years of Data Science".  
Hofmann, Heike and **Vanderplas, Susan** (Dec. 19, 2017). "All of This Has Happened Before. All of This Will Happen Again: Data Science". In: *Journal of Computational and Graphical Statistics* 26.4, pp. 775–778. DOI: <https://doi.org/10.1080/10618600.2017.1385474>.  
**Contribution:** Writing (75%).
1.  Budrus, Sarah, **Plas, Susan Vander**, and Cook, Dianne (2013). "In tennis, do smashes win matches?" In: *Significance* 10.3, pp. 35–38. DOI: <https://doi.org/10.1111/j.1740-9713.2013.00665.x>.

In Progress **Visual narratives of the COVID-19 pandemic** A discussion of how graphics were used during the first two years of COVID-19. In press at JDSSV.

**Exploring Rural Shrink Smart Through Guided Discovery Dashboards** with Denise Bradford. Revision submitted to Journal of Data Science, Sept 2022.

**'You Draw It': Implementation of visually fitted trends with r2d3** with Emily Robinson and Reka Howard. Revision submitted to Journal of Data Science, Sept 2022.

**Perception of Log Scales** Assessment of perception and use of log scales to display exponential growth. Several manuscripts in preparation.

**Generalized Parallel Coordinate Plots: ggpcp** with Heike Hofmann and Antony Unwin. An R package for creation of generalized parallel coordinate plots. Paper in preparation for submission to JCGS.

**Bullet Signature Resampling** Method for resampling bullet signatures used to calculate match and non-match score distributions.

## Grants

### Under Review

2022

**NIJ: R&D In Forensic Science, Physical Simulation of Lower Body Biomechanics for Artificial Shoe Wear and Forensics Analysis**, Co-PI, Total: \$299,859, Sub: \$73,693

### Funded

2021

2023

**NIJ: R&D In Forensic Science, Automatic Acquisition and Identification of Footwear Class Characteristics**, PI, Total: \$380,650

2021

2022

**USDA-NIFA: Agriculture and Food Research Initiative, Corn Residue Adaptive Grazing Strategies**, Collaborator, Total: \$300,000

2020

2025

**NIST: Center for Statistics and Applications in Forensic Evidence, Footwear Class Characteristics and Human Factors**, PI, Total: \$20,000,000, Sub: \$456,930

2021

2023

**USDA-NRCS: Conservation Innovation Grant On-Farm Trials, Improving the Economic and Ecological Sustainability of US Crop Production through On-Farm Precision Experimentation**, PI, Total: \$4,000,000, Sub: \$400,000 (Split between 3 UNL co-PIs)

2020

2023

**NSF: Smart and Connected Communities, Overcoming the Rural Data Deficit to Improve Quality of Life and Community Services in Smart & Connected Small Communities**, PI, Total: \$1,500,000, Sub: \$123,445

2019

2020

**NIJ: R&D In Forensic Science, Statistical Infrastructure for the Use of Error Rate Studies in the Interpretation of Forensic Evidence**, Collaborator, Total: \$197,699, Sub: \$57,596

## Not Funded

2020

**USDA-NIFA: Agriculture and Food Research Initiative**, *Practical Framework to Facilitate Adoption of In-Season N Management Technology in Commercial Fields*, Collaborator, Total: \$300,000

2020

**NSF: National Artificial Intelligence Research Institutes**, *AI Institute: AgroAI: The Institute for Advancing Agriculture and Food in a Changing World Using AI*, Collaborator, Total: \$20,000,000

2019

**USDA-AFRI: Sustainable Agricultural Systems**, *A Cyber-Physical System for Data-Intensive Farm Management*, PI, Total: \$3,000,000

2018

**NIJ: R&D In Forensic Science**, *Evaluating Photogrammetry for 3D Footwear Impression Recovery*, PI, Total: \$281,755

## Talks

### Invited

2021

**How do you define a circle? Perception and Computer Vision Diagnostics**, *JSM*, Section on Statistical Graphics, Seattle, WA

2021

**Pandemics, Graphics, and Perception of Log Scales**, *R Ladies DC*, Washington, DC

2020

**Perception and Visual Communication in a Global Pandemic**, *Data Science, Statistics, and Visualization*, SAMSI, Online

2020

**One of these things is not like the others: Visual Statistics and Testing in Statistical Graphics**, *Data Science Symposium*, South Dakota State University, Brookings, SD

2020

**Big Data, Big Experiments, and Big Problems**, *Plant and Animal Genome*, San Diego, CA

2019

**Statistical Lineups for Bayesians**, *JSM*, Section on Statistical Graphics, Denver, CO

2018

**Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics**, *SDSS*, Reston, VA

2015

**Animint: Interactive Web-Based Animations using Ggplot2's Grammar of Graphics**, *JSM*, Section on Statistical Graphics, Seattle, WA

2014

**The curse of three dimensions: Why your brain is lying to you**, *JSM*, Section on Statistical Graphics, Boston, MA

### Contributed

2022

**Local Population Footwear Class Characteristics - An End-to-End Pipeline for Automatic Data Acquisition and Analysis**, *IAI*, Omaha, NE

2022

**From Scans to Scores**, *IAI*, Omaha, NE

2021

**Welcome to Forensic Statistics**, *Data Mishaps Night*, Online

2018

**Framed Charts in the 1870 Statistical Atlas**, *JSM*, Section on Statistical Graphics, Vancouver, BC, CA

2017

**A Bayesian Approach to Visual Inference**, *JSM*, Section on Statistical Graphics, Baltimore, MD

2016

**Clusters Beat Trend!? Testing Feature Hierarchy in Statistical Graphics**, *JSM*, Section on Statistical Graphics, Chicago, IL

2015

**Visual Aptitude and Statistical Graphics**, *InfoVis*, IEEE, Chicago, IL

2014

**Do You See What I See? Using Shiny for User Testing**, *JSM*, Section on Statistical Graphics, Boston, MA

2014	<b>Animint: Interactive, Web-Ready Graphics with R</b> , <i>Great Plains R User Group</i> , Sioux Center, IA
2013	<b>Signs of the Sine Illusion – why we need to care</b> , <i>JSM</i> , Section on Statistical Graphics, Montreal, ON, CA
<b>Seminars</b>	
2022	<b>Reproducible Science: Statistics, Forensics, and the Law</b> , <i>Statistics</i> , University of Nebraska, Lincoln, Lincoln, NE
2022	<b>How to make good charts</b> , <i>Complex Biosystems</i> , University of Nebraska Lincoln, Lincoln, NE
2022	<b>Pandemics, Graphics, and Perception of Log Scales</b> , <i>Math</i> , University of Nebraska Omaha, Omaha, NE
2022	<b>Automatic Acquisition of Footwear Class Characteristics</b> , <i>Center for Statistical Applications in Forensic Evidence</i> , Online
2021	<b>Pandemics, Graphics, and Perception of Log Scales</b> , <i>NUMBATS</i> , Monash University, Melbourne, Vic, AUS
2021	<b>Exploring Rural Quality of Life Using Data Science and Public Data</b> , <i>QQPM</i> , University of Nebraska Lincoln, Lincoln, NE
2021	<b>Inconclusive Conclusions: Biases and Consequences</b> , <i>Law and Psychology Brown Bag</i> , University of Nebraska Lincoln, Lincoln, NE
2021	<b>Visual Statistics: Communication and Graphical Testing</b> , <i>Animal Science</i> , University of Nebraska Lincoln, Lincoln, NE
2021	<b>How to Make Good Charts</b> , <i>Biological and Systems Engineering GSA</i> , University of Nebraska Lincoln, Lincoln, NE
2020	<b>Statistical Evaluation of Firearms and Toolmark Evidence</b> , <i>Statistics</i> , University of Nebraska Lincoln, Lincoln, NE

## Software

Dates show initial involvement; only packages which are no longer maintained have end dates.

2021	<b>ggpcp</b> , <i>Generalized parallel coordinate plots</i> , <a href="#">Repository</a>
2020	<b>vinference</b> , <i>Analysis of visual inference experiments</i> , <a href="#">Repository</a>
2019	<b>groovefinder</b> , <i>Identification of grooves in scans of bullet land engraved areas</i> , <a href="#">Repository</a>
2021	<b>cmcR</b> , <i>Automated matching of 3d cartridge case scans using the congruent matching cells algorithm</i> , <a href="#">Repository</a>
2018	<b>bulletxtctr</b> , <i>Automated matching of 3d bullet scans</i> , <a href="#">Repository</a>
2018	<b>x3ptools</b> , <i>Reading, manipulating, and visualizing x3p files</i> , <a href="#">Repository</a>
2018	<b>bulletsamplr</b> , <i>Resampling of bullet signatures</i> , <a href="#">Repository</a>
2018	<b>ShoeScraperR</b> , <i>Acquisition of shoe images and metadata from online retailers</i> , <a href="#">Repository</a>
2020	<b>ImageAlignR</b> , <i>Image registration algorithms for forensics</i> , <a href="#">Repository</a>
2021	<b>animint</b> , <i>Animated, interactive web graphics for R using ggplot2 and d3.js</i> , <a href="#">Repository</a>
2013	
2015	

## Teaching

2022

**STAT 151**, *Introduction to Statistical Computing*, University of Nebraska Lincoln, Flipped synchronous Evals: 4.95 (mean), 5 (median)

2022

**STAT 218**, *Introduction to Statistics*, University of Nebraska Lincoln, Online asynchronous Evals: 3.72 (mean), 4 (median)

2022

**STAT 850**, *Computing Tools for Statisticians*, University of Nebraska Lincoln, Flipped synchronous

2022

**STAT 892**, *Writing in Statistics/TA Prep*, University of Nebraska Lincoln, In person synchronous

2022

**STAT 982**, *Advanced Inference*, University of Nebraska Lincoln, Co-taught with Bertrand Clarke

2021

**STAT 218**, *Introduction to Statistics*, University of Nebraska Lincoln, Online asynchronous. Evals: 4.01 (mean), 4 (median)

2021

**STAT 850**, *Computing Tools for Statisticians*, University of Nebraska Lincoln, Hybrid, flipped, synchronous Evals: 4.79 (mean), 5 (median)

2020

**STAT 218**, *Introduction to Statistics*, University of Nebraska Lincoln, Initially in person synchronous, then online asynchronous Evals: 4.20 (mean), 4 (median)

2020

**STAT 850**, *Computing Tools for Statisticians*, University of Nebraska Lincoln, Hybrid, flipped, synchronous Evals: 4.76 (mean), 5 (median)

2019

**STAT 585**, *Data Technologies for Statistical Analysis*, Iowa State, Co-taught with Heike Hofmann Evals: 4.92 (mean), 5 (median)

## Mentoring and Advising

### Ph.D.

2022

**Weihao (Patrick) Li**, *Monash University*, Advances in Artificial Intelligence for Data Visualization: Developing Computer Vision Models to Automate Reading of Data Plots, with Application to Predictive Model Diagnostics, co-advised with Dianne Cook and Emi Tanaka

2021

**Rachel Rogers**, *University of Nebraska Lincoln*, Explainable Machine Learning for Forensics in Courtrooms

2020

**Alison Kleffner**, *University of Nebraska Lincoln*, Spatial Statistics and Visualization in Ecology and Agriculture, co-advised with Yawen Guan

2020

**Joseph Zemmels**, *Iowa State University*, Analysis and Matching of Cartridge Cases, co-advised with Heike Hofmann

2020

**Emily Robinson**, *University of Nebraska Lincoln*, Perception of Log Scales, co-advised with Reka Howard

### MS

2022

**Tyler Wiederich**, *University of Nebraska Lincoln*, Perception of Three Dimensional Graphics

2022

**Muxin Ha**, *University of Nebraska Lincoln*, Automatic Recognition of Shoe Class Characteristics

2021

**Jayden Stack**, *University of Nebraska Lincoln*, Automatic Recognition of Shoe Class Characteristics

2020

**Ved Piyush**, *University of Nebraska Lincoln*, Machine Learning and Computer Vision

2020

2019

**Joseph Zemmels**, *Iowa State University*, Analysis and Matching of Cartridge Cases, co-advised with Heike Hofmann

2019


**Eryn Blagg**, *Iowa State University*, Analysis of Wear Development in Three-Dimensional Shoe Scans, co-advised with Heike Hofmann

2018


**Miranda Tilton**, *Iowa State University*, Footwear Class Characteristics and Computer Vision



## Undergraduate

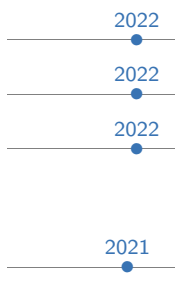
- 
- 2021  
2021  
2019  
2019  
2018
- Xinyu Liu**, *University of Nebraska Lincoln*, Machine Learning for Shoe Sole Images, UNL FYRE Program
- Jason Seo**, *Iowa State University*, R package for visualization of neural networks using the python library keras-vis
- Talen Fisher**, *Iowa State University*, Database engineering and tools for working with x3p files

## Summer

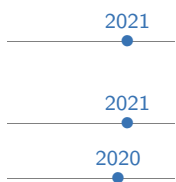
- 
- 2019  
2019  
2019  
2018  
2018
- Molly McDermott and Andrew Maloney**, *Iowa State University*, Bullet Scan Quality and Machine Learning
- Syema Ailia, Emmanuelle Hernandez Morales, Tiger Ji**, *Iowa State University*, Rapid quality control tools for confocal microscopy scans
- Ben Wonderlin, Jenny Kim**, *Iowa State University*, Footwear Class Characteristics and Computer Vision, Young Engineers and Scientists Program

## Outreach

### Legal Briefs and Testimony

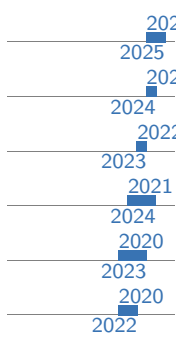
- 
- 2022  
2022  
2022  
2021
- Amicus Curiae Brief**, *Supreme Court of New Jersey*, A-56-18 State v. Michael Olenowski (082253)
- Amicus Curiae Brief**, *Supreme Court of Maryland*, In Support of Appellant Kobina Ebo Abruquah
- Written Testimony**, *Cook County Circuit Court*, Reply to Response by FBI Laboratory filed in Illinois v. Winfield and Affidavit by Biederman et al. (2022) filed in US v. Kaevon Sutton (2018 CF1 009709)
- Written Testimony**, *Cook County Circuit Court*, Assessment of the Reliability of Studies of Firearms Examination in Forensics

### Forensic Practitioners

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- 2021  
2021  
2020
- Blog Post**, *CSAFE*, Q&A - Treatment of Inconclusive Results in Error Rates of Firearm Studies ([Link](#))
- Webinar**, *CSAFE*, Treatment of Inconclusive Results in Error Rates of Firearm Studies
- CSAFE Firearms Workshop**, Invited Talk: Open Source Software in Forensics

## Service

### Service to the Discipline

- 
- 2023  
2025  
2023  
2024  
2022  
2023  
2021  
2024  
2020  
2023  
2020  
2022
- Advisory Committee on Forensic Science**, ASA
- Graphics Section Chair**, ASA
- Graphics Section Chair-Elect**, ASA
- Associate Editor**, *Journal of Computational and Graphical Statistics*
- Associate Editor**, *R Journal*
- Graphics Section Program Chair (2021)**, ASA, Official duties include planning JSM sessions in 2020 and running the Data Expo in 2022

2020

**Program Committee (Graphics)**, *Symposium on Data Science and Statistics 2020*, Visualization Track co-chair

2019  
2021

**Gertrude Cox Scholarship Committee Member**, ASA

Assisted with selection of the Gertrude Cox Scholarship recipients and honorable mentions

2019

**Uncoast Unconference Organizing Committee**, Des Moines, IA

Organized the first R Uncoast Unconference to bring R developers in flyover country together for a 3-day event. Over 50% of the participants at the conference were women or minorities, and participants included students, academics, and industry R programmers with a variety of experience levels in R programming.

2017  
2019

**Graphics Section Representative to the Council of Sections**, ASA

## Department and Institutional Service

2021

**R Workshop Coordinator**

Develop and coordinate a week of R workshops taught in January, May, and August each year

2021  
2022

**Faculty Senate**, *Statistics Department Representative*

2021  
2022

**Faculty Advisory Council**, *Vice-Chair*

2021  
2022

**MS Comp Exam Committee**

Committee to evaluate the current MS Stat Day presentation component and consider other options for the MS program

2021

**Digital Ag Minor Committee**

Committee to develop a digital ag minor.

2021

**Data Science Joint Committee**

Committee of Math, Computer Science, and Statistics departments to develop a comprehensive undergraduate data science program.

2020  
2021

**Seminar Organizer**

Arrange speakers for the department seminar.

2020

**SCIL 101 Poster Judge**, *Fall Semester*

2019  
2020

**Undergraduate Program Committee**

Design an undergraduate statistics major and submit the proposal to the university.

## Training & Professional Development

2022  
2023

**Nebraska Governance and Technology Center**, *Faculty Fellow*

2021  
2022

**Peer Review of Teaching Program**

Create a course portfolio for Stat 850 in order to assess course design and analyze student engagement and learning

2020

**New Faculty Development Program**

2020

**Summer Institute for Online Teaching**

Online course structure and backwards design principles