Aaron D. Nielsen

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Contact Information

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Education

Ph.D. Applied Mathematics	University of Colorado – Denver	2018
M.S. Statistics	Colorado State University	2014
M.S. Applied Mathematics	University of Colorado – Denver	2012
M.S. Electrical Engineering	University of Colorado – Boulder	2008
B.S. Electrical Engineering and Mathematics	Colorado State University	2007
B.A. Philosophy	Colorado State University	2024

Current Position

Colorado State University, Department of Statistics 2018 –
Associate Professor of Statistics 2024 –
Assistant Professor of Statistics 2018 – 2024

I am currently teaching and coordinating courses in statistics and mentoring graduate teaching assistants as an associate professor. I have taught over a dozen courses, designed two new classes in Sports Analytics, spearheaded the development of an undergraduate certificate in Sports Statistics and Analytics, and have advised undergraduate research projects and independent studies.

Industry Experience

MacAulay-Brown, Inc., Aurora, Colorado 2009 – 2012
Engineer III

I served as a Model and Simulation Engineer, developing detection and estimation algorithms for electronic intelligence using MATLAB and C, while holding a TS/SCI clearance and contributing to multiple classified programs.

Teaching History

Courses Taught (Colorado State University)

STAT 100: Statistical Literacy	STAT 351: Sports Statistics and Analytics I
STAT 201: General Statistics	STAT 451: Sports Statistics and Analytics II
STAT 204: Statistics for Business Students	STAT 460: Applied Multivariate Analysis
STAT 301: Applied Statistical Methods	STAT 472: Statistical Research
STAT 305: Sampling Techniques	STAR 502: Multivariate Analysis for Researchers
STAT 315: Theory and Practice of Statistics	STAA 556: Statistical Consulting
STAT 342: Statistical Data Analysis II	STAA 574: Methods in Multivariate Analysis

Courses Taught (University of Colorado Denver)

MATH 1110: College Algebra	MATH 3382: Statistical Theory
MATH 1401: Calculus I	MATH 3800: Probability and Statistics for Engineers
MATH 2411: Calculus II	MATH 4810: Probability
MATH 3191: Applied Linear Algebra	MATH 4820/5320: Mathematical Statistics

Course/Program Development

Undergraduate Certificate in Sports Statistics and Analytics: I spearheaded the development of a new undergraduate certificate in Sports Statistics and Analytics. This certificate provides students with the knowledge and skills needed to work in the expanding field of sports analytics. This development was driven by significant student interest and increasing demand in industry. This certificate program and associated courses were approved by UCC in January 2023.

As a part of this new certificate program, I designed and have taught two new courses in this field:
STAT 351: Sports Statistics and Analytics I
STAT 451: Sports Statistics and Analytics II

Course Redesign

STAT315: Theory and Practice of Statistics: I redeveloped this introductory course to incorporate data analysis using the R programming language. I also programmed all new online homework assignments using WebAssign that allowed for instant feedback while also significantly reducing course costs for students.

STAT472: Statistical Research: I redeveloped this capstone course to incorporate a warm-up data analysis project followed by a 10-week in-depth statistical analysis of a dataset that students choose. This reorganization has allowed the course to expand to a wider audience while also demanding fewer faculty resources. Students now present their final projects to a public audience including Statistics faculty.

Advising Experience

Graduate Advisory Committee Member

Shree Sowndarya S.V.	Ph.D. Chemistry	Summer 2024
Mantautas Rimkus	Ph.D. Statistics	Summer 2023
Aaron Lear	M.S. Mathematics	Summer 2022
Sara Horton	M.M. Music Therapy	*(in progress)*

Undergraduate Honor's Committee Advisor

Ryan Marquart	B.S. Data Science	Spring 2023
Ellie Martinez	B.S. Statistics/B.A. Economics	Spring 2023
Adam Kiehl	B.S. Data Science	Spring 2022
Ethan Creagar	B.S. Data Science	Spring 2022

Undergraduate Honor's Committee Member

Boston Lee	B.S. Statistics/B.A. Philosophy	Fall 2021

Undergraduate Summer Research Projects

Gabe Macklem	*Informing Tactical Periodization in Collegiate Football*	Summer 2024
Chandler Grote	*College Football Recruiting Analysis*	Summer 2024
Danielle Contreras	*Statistical Analysis of College Softball Pitching Using Rapsodo Data*	Summer 2023
Aidan Feeley	*Analyzing Spin Direction for Division I Softball*	Summer 2023
Jake Shankles	*A Statistical Analysis of Philosophers on Philosophy*	Summer 2023
Justin Eldridge	*Nonparametric Estimation of Draft Pick Values for Professional Sports*	Summer 2023
Nick Brinegar	*Shiny App to Visualize ELO for Division I Softball Teams*	Summer 2023
Matthew Boyd	*Playing the Odds: Defensive Positioning Strategies to Minimize Batting Average in Major League Baseball*	Summer 2022

Professional Development

Best Practices in Teaching at CSU: Teaching Online course participant Summer 2023
– After taking this course, I implemented new strategies in my online courses including shorter videos, instructor introduction videos, and online discussions.

Best Practices in Teaching at CSU: Inclusive Pedagogy course participant Summer 2023
– After taking this course, I updated course reading assignments to be compatible with read-aloud software and implemented more low-stakes in-class discussions.

Best Practices in Teaching at CSU: First Four Weeks course participant Summer 2022
– After taking this course, I improved and expanded early semester feedback, participating in early performance feedback, and introduced early semester low-stakes assessments in an effort to provide students with early feedback.

University Service

College of Natural Sciences Scholarship Committee, Member	2023 –
Departmental Awards Committee, Member	2021 – 2023
Newsletter Committee, Member	2021 – 2022
GTA Evaluation and Mentoring Committee, Chair	2019 – 2021

Research Interests

Sports Analytics, Sabermetrics, Statistics and Mathematics Education, Statistical Machine Learning, Biological Population Models

Publications

Simon, Burton, and **Nielsen, Aaron**. "Numerical Solutions and Animations of Group Selection Dynamics." *Evolutionary Ecology Research*, 14 (2012): 757-68.

Honors and Awards

Lynn Bateman Memorial Excellence in Teaching Award	2016
CIMS Fellowship	2013
Williams Scholarship	2012 – 2013
GAANN Fellowship	2007 – 2008
Claude W. Wood Scholarship	2002 – 2006
Colorado Distinguished Scholar	2002 – 2006
Fort Collins High School Valedictorian	2002

Security Clearances

Top Secret / Sensitive Compartmented Information (TS-SCI) clearance	2009 – 2012
Counterintelligence (CI) polygraph	2009

Computer Skills

Basic: JMP, SAS, C, Java, Perl, BUGS, PLINK, SPICE, MathCAD, Adobe Photoshop
Intermediate: ggplot2, HTML, CSS, Microsoft Office, Unix/Linux, Microsoft Windows, OS X
Advanced: R, MATLAB, LaTeX

Professional Memberships

American Statistical Association (ASA)
Mathematical Association of America (MAA)
Society for Industrial and Applied Mathematics (SIAM)
Institute of Electrical and Electronics Engineers (IEEE)
Society for American Baseball Research (SABR)
Tau Beta Pi
Eta Kappa Nu

Clubs

Faculty participant and organizer, CSU Statistics Book Club	2019 –
Faculty advisor, CSU Men's Club Soccer	2018 –
Co-founder and Vice President, UCD Machine Learning Club	2016 – 2018

Internships

Institute for Telecommunication Sciences, Boulder, Colorado — May – August 2007
Engineering Intern

Developed and maintained a MATLAB graphic user interface (GUI) to process real-time wireless communication data.

UV-B Monitoring and Research Program, Fort Collins, Colorado — May – August 2006
Engineering Intern

Tested and troubleshooted Ultraviolet Multifilter Rotating Shadowband Radiometers (UV-MFRSR) for use in measuring solar irradiance.

Recent Courses Taught

Semester	Course	Approx. Students
Fall 2025	STAT 201: General Statistics	300
Fall 2025	STAT 204: Statistics for Business Students	300
Summer 2025	STAT 315: Theory and Practice of Statistics	30
Spring 2025	STAT 204: Statistics for Business Students	300
Spring 2025	STAT 315: Theory and Practice of Statistics	45
Spring 2025	STAT 472: Statistical Consulting	25
Fall 2024	STAT 100: Statistical Literacy	30
Fall 2024	STAT 204: Statistics for Business Students	300
Fall 2024	STAT 315: Theory and Practice of Statistics	45
Summer 2024	STAT 315: Theory and Practice of Statistics	25
Spring 2024	STAT 315: Theory and Practice of Statistics [2 sections]	90
Spring 2024	STAT 451: Sports Statistics and Analytics II	20
Spring 2024	STAT 472: Statistical Research	20
Fall 2023	STAT 315: Theory and Practice of Statistics [2 sections]	90
Fall 2023	STAT 351: Sports Statistics and Analytics I	25
Summer 2023	STAT 315: Theory and Practice of Statistics	15
Spring 2023	STAT 315: Theory and Practice of Statistics [2 sections]	90
Spring 2023	STAT 451: Sports Statistics and Analytics II	20
Spring 2023	STAT 472: Statistical Research	15
Fall 2022	STAT 305: Sampling Techniques	25
Fall 2022	STAT 451: Sports Statistics and Analytics II	15
Fall 2022	STAT 472: Statistical Research	10
Spring 2022	STAT 315: Theory and Practice of Statistics [2 sections]	90
Spring 2022	STAT 342: Statistical Data Analysis II	30
Spring 2022	STAT 472: Statistical Research	15
Fall 2021	STAT 305: Sampling Techniques	35
Fall 2021	STAT 315: Theory and Practice of Statistics	40
Fall 2021	STAT 472: Statistical Research	10