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 (in progress)	Colorado State University	(May 2024)

Current Position

Colorado State University, Department of Statistics 2018 –
Assistant Professor

I am currently teaching and coordinating courses in statistics and mentoring graduate teaching assistants as an assistant professor.

Recent Courses Taught

Fall 2023:	STAT 315, STAT 351
Summer 2023:	STAT 315
Spring 2023:	STAT 315, STAT 472, STAT 451
Fall 2022:	STAT 305, STAT 472, STAT 351
Spring 2022:	STAT 315, STAT 472, STAT 342
Fall 2021:	STAT 315, STAT 472, STAT 305
Summer 2021:	STAA 556
Spring 2021:	STAT 315, STAT 472
Fall 2020:	STAT 315, STAT 472, STAT 100
Summer 2020:	STAT 315
Spring 2020:	STAT 315, STAT 472, STAT 460, STAA 574
Fall 2019:	STAT 315, STAT 472, STAR 502
Summer 2019:	STAT 315
Spring 2019:	STAT 315, STAT 201, STAT 472, STAA 460
Fall 2018:	STAT 315, STAT 201

Sports Analytics Course Development

I proposed and created a new undergraduate certificate in Sports Statistics and Analytics which was approved by the university and will be available beginning in Fall 2023. As a part of this effort, I have developed and taught two foundational courses for this certificate.

STAT 351: Sports Statistics and Analytics I – an introductory course in Sports Analytics that applies and extends introductory statistical methods to analyze sports data. This course was first offered in Fall 2022.

STAT 451: Sports Statistics and Analytics II – an advanced level course in Sports Analytics that applies methods from multivariate analysis and machine learning to analyze sports data. This course was first offered in Spring 2023.

Teaching History

Colorado State University, Department of Statistics 2012 – 2015, 2018 –

I have taught the following undergraduate and graduate courses in statistics while as a faculty member and as a graduate student. In addition, I have served as the course coordinator and managed graduate teaching assistants for STAT 201, STAT 315, and STAT 472.

In 2022, I was nominated for CSU Best Teacher which is sponsored by CSU Alumni Association.

Courses Taught	Semesters Taught
STAT 100: Statistical Literacy	FA20
STAT 201: General Statistics	SP19, FA18, SM15
STAT 204: Statistics for Business Students	SM14, SP14, FA13
STAT 301: Applied Statistical Methods	SP15, FA14
STAT 305: Sampling Techniques	FA22, FA21
STAT 315: Theory and Practice of Statistics	SP24, FA23, SM23, SP23, SP22, FA21,
SP21, FA20,	SM20, SP20, FA19, SM19, SP19,
	FA18
STAT 342: Statistical Data Analysis II	SP22
STAT 351: Sports Statistics and Analytics I	FA23, FA22
STAT 451: Sports Statistics and Analytics II	SP24, SP23
STAT 460: Applied Multivariate Analysis	SP20, SP19
STAT 472: Statistical Research	SP23, FA22, SP22, FA21, SP21,
	FA20, SP20, FA19, SP19
STAR 502: Multivariate Analysis for Researchers	FA19
STAA 556: Statistical Consulting	SM21
STAA 574: Methods in Multivariate Analysis	SP20

University of Colorado Denver, Department of Mathematics and Statistics 2015 – 2018

I taught the following undergraduate and graduate courses in mathematics and statistics while completing a Ph.D. in Applied Mathematics.

In 2016, I received the Lynn Bateman Memorial Excellence in Teaching Award.

Courses Taught	Semesters Taught
MATH 1110: College Algebra	FA17
MATH 1401: Calculus I	FA16
MATH 2411: Calculus II	SP17
MATH 3191: Applied Linear Algebra	SP18
MATH 3382: Statistical Theory	SM17
MATH 3800: Probability and Statistics for Engineers	SM18, SM17, SM16, SP16, FA15
MATH 4810: Probability	SM15
MATH 4820/5320: Mathematical Statistics	SM16

Advising Experience

Graduate and Undergraduate Advisor, Colorado State University 2018 –

Advised and mentored undergraduate and graduate students while serving as a faculty member.

Graduate Advisory Committee Member

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

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

Mentoring Experience

Course Coordinator, Colorado State University 2018 –

Coordinated graduate students teaching undergraduate courses and recitations and provided feedback on their teaching methods. Courses have included STAT 201, STAT 315, STAT 472

Graduate Teaching Assistant Peer Mentor, University of Colorado Denver 2015 – 2018

Mentored first and second year graduate students on mathematics education and pedagogy. Met biweekly with students, observed their classes, and offered feedback on their methods.

Undergraduate Research Mentor, University of Colorado Denver Fall 2016

Supervised and mentored two undergraduate economics majors on an independent research project analyzing faculty/course questionnaire results. This project utilized a variety of machine learning methods and the final project was presented at the graduate student seminar series.

Departmental Service

Colorado State University, Department of Statistics

Departmental Awards Committee, Member	2021 –
Newsletter Committee, Member	2021 – 2022
GTA Evaluation and Mentoring Committee, Chair	2019 – 2021

Professional Development

Best Practices in Teaching at CSU: Teaching Online course participant	Summer 2022
Best Practices in Teaching at CSU: Inclusive Pedagogy course participant	Summer 2023
Best Practices in Teaching at CSU: First Four Weeks course participant	Summer 2022
Diversity, Equity, and Inclusion Foundations (CIEP 1) course participant	Fall 2021
Graduate Teaching Assistant Peer Mentee, University of Colorado Denver	2015 – 2016
Critical Issues in Math Education Seminar, University of Colorado Denver	2015 – 2018
Excellence in Teaching Symposium, University of Colorado Denver	August 2016

Research Interests

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

Peer-Reviewed Publications

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

Boyd, Matthew, Weller, Zachary, and **Nielsen, Aaron**. "Playing the Odds: Defensive Positioning Strategies to Minimize Batting Average in Major League Baseball." (In submission)

Nielsen, Aaron and Simon, Burton. "Fixation Times in Group-Structured Populations." (In preparation)

Clubs

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

Industry Experience

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

I worked as a model and simulation engineer, specifically in the area of algorithm development. This algorithm development dealt with detection and estimation applications for electronic intelligence. MATLAB and C were the primary tools for this development.

In 2009, I acquired a Top Secret/Sensitive Compartmentalized Information (TS/SCI) clearance and collaborated in multiple classified programs.

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.

Presentations/ Talks

Dissertation defense. University of Colorado Denver. — June 2018
100^{th} Anniversary MAA Rocky Mountain Section Conference. Pueblo, Colorado. — April 2017
Statistics Research Seminar. University of Colorado Denver. — April 2017
SIAM Front Range Student Conference. Denver, Colorado. — March 2017
Graduate Student-Led Seminar. University of Colorado Denver. — December 2016

Poster Presentations

"Analyzing FCQ Results Using Advanced Data Analytics" — April 2017
Research and Creative Activities Symposium. University of Colorado Denver.

"A Survey of Recent Genetic Developments in Ant Social Polymorphism" — December 2015
Topics in Statistical Genetics. University of Colorado Denver.

"A Stochastic Model of Sediment Transport" (advised undergraduate statistics majors) — May 2014
Undergraduate Research Symposium. Colorado State University.

"Dual Polarization Radar Signal Processing" — May 2007
Engineering Senior Design Project Poster Session. Colorado State University.

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

Graduate School Coursework

Statistics

Computational Statistics
Bayesian Statistics
Spatial Statistics
Mathematical Statistics
Statistical Machine Learning
Statistical Consulting
Statistical Genetics
Survey Sampling
Regression and Data Analysis
Functional Data Analysis
Categorical Data Analysis
Time Series Analysis
Multivariate Analysis
Linear Models
Experimental Design

Probability

Probability Theory
Mathematical Probability
Probabilistic Modeling
Stochastic Processes
Stochastic Calculus

Mathematics

Modern Algebra I & II
Linear Algebra
Real Analysis
Number Theory
Algebraic Number Theory

Electrical Engineering

Digital Signal Processing
Digital Communications
Wireless Communications
Applied Network Security
Random Processes
Information Theory
Error Control Coding
Analog IC Design