

Sam Hawke

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Personal Website



Research Interests: dimension reduction in case-control studies, high-dimensional data analysis, fairness in machine learning, biostatistical consulting, teaching statistics

Professional Experience

Skidmore College

Department of Mathematics and Statistics

Assistant Professor of Statistics

August 2025 to present

Education

Ph.D. in Biostatistics

University of North Carolina, Chapel Hill, NC

Thesis Advisor: Didong Li, Ph.D.

May 2025

B.S. in Mathematical Sciences

Carnegie Mellon University, Pittsburgh, PA

Graduated with University Honors

May 2020

Publications

- **Hawke, Sam**, Yue-En Ma, and Didong Li. "Contrastive Dimension Reduction: When and How?" *Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS)*, 2024.
- **Hawke, Sam**, Hengrui Luo, and Didong Li. "Contrastive Inverse Regression for Dimension Reduction." *New England Journal of Statistics in Data Science*, 2024.
- Ciccone, Emily J., Deanna R. Zhu, Annika K. Gunderson, **Sam Hawke**, Rawan Ajeen, Evans K. Lodge, Bonnie E. Shook-Sa et al. "Magnitude and Durability of the Antibody Response to mRNA-Based Vaccination Among SARS-CoV-2 Seronegative and Seropositive Health Care Personnel." In *Open Forum Infectious Diseases*. US: Oxford University Press, 2024.
- Boyce, Ross M., Enid Muhindo, Emmanuel Baguma, Rabbison Muhindo, Bwambale Shem, Ruthly François, **Sam Hawke** et al. "Permethrin-Treated Baby Wraps for the Prevention of Malaria: Results of a Randomized Controlled Pilot Study in Rural Uganda." *Malaria Journal*, 2022.

Teaching Experience

Skidmore College

Fall 2025

- MS-104 (Introduction to Statistics)
- MS-204 (Statistical Methods)

University of North Carolina

Graduate Teaching Assistant

- **BIOS 774 (Advanced Machine Learning)** *Fall 2024*
 - Developed comprehensive course notes and instructional materials.
- **BIOS 660 (Probability and Statistical Inference I)** *Fall 2022, Fall 2024*
 - Filled in as guest lecturer and graded homework.
- **BIOS 600 (Principles of Statistical Inference)** *Spring 2023*
 - Led recitations and held regular office hours.

Carnegie Mellon University

Undergraduate Teaching Assistant

- **21-127 (Concepts of Mathematics)** *Fall 2018, Fall 2019, Spring 2020*
 - Led recitations, held regular office hours, and graded homework and exams.
- **21-111 (Differential and Integral Calculus)** *Spring 2019*
 - Led recitations, held regular office hours, and graded homework.
- **21-241 (Matrices and Linear Transformations)** *Fall 2017, Spring 2018*
 - Led recitations, held regular office hours, and graded homework.

Art of Problem Solving

Teaching Assistant

- **Introduction to Algebra A** *Spring 2018*
 - Answered student questions during online class, graded homework.
- **Probability and Combinatorics I** *Summer 2018*
 - Answered student questions during online class, graded homework.

Talks

Dimension Reduction: Contrastive, Supervised, and Fair Approaches *April 2025*
Presented in *Graduate Biostatistics Student Association Student Seminar Series*, Chapel Hill, NC

Conference Presentations

Perceptions of Unprofessionalism: Assessing Generational Influences *September 2024*
Co-author
Presented by Fei Chen at *American Board of Medical Specialties Conference*, Chicago, IL

Contrastive Dimension Estimation

August 2024

Presented at *Joint Statistical Meetings*, Portland, OR

Contrastive Dimension Reduction

March 2024

Presented at *Eastern North American Region Spring Meeting*, Baltimore, MD

Is Microsurgery Needed to Implement Enhanced Recovery after Surgery (ERAS)? *June 2023*

Second Author

Presented by Peter Drossopoulos at *SESPRS 66th Annual Scientific Meeting*, Nassau, Bahamas

Contrastive Inverse Regression for Dimension Reduction

May 2023

Presented at *Symposium on Data Science and Statistics*, St. Louis, MO

Contrastive Inverse Regression

March 2023

Presented at *3rd Annual Data Science Workshop*, Augusta, GA

Exploring the Robustness of Deep Learning Architectures

July 2019

Presented at *Symposium on Big Data, Human Health and Statistics*, Ann Arbor, MI

Industry Experience

- **Samsara Inc.**, Research Science Intern

Summer 2024

- Led clustering analysis of customer data, applying principles of reproducible research and industry standard of code organization.

Review / Referee Experience

- **Scatterplot Journal**
- **Neural Information Processing Systems (NeurIPS)**
- **Proceedings of the National Academy of Sciences (PNAS)**
- **Grant Review Submissions through the North Carolina Translational and Clinical Sciences Institute (NC TraCS)**
 - Evaluated Clinical & Translational Science (CTS) pilot grant proposals, focusing on the feasibility and statistical rigor of the proposed research projects.

Grants Supported

Grant - In Preparation

November 2024

PI: Tim Daaleman, D.O., M.P.H

- Title: “Individual and Place Effects Influencing the Experience of Homelessness and Exiting Homelessness”
- Role: Simulations for power and sample size calculations.

NIH Grant - Under Review*September 2024*

PI: John Batsis, M.D.

- Title: “Enhancing Muscle Preservation in Older Adults with Obesity and Type 2 Diabetes on Incretin Therapies: A Pilot Study”
- Role: Development of statistical analysis plan.

Hevolution Foundation Grant - Under Review*August 2024*

PI: John Batsis, M.D.

- Title: “Geroscience Biomarkers and Incretin Therapy: Mechanistic Insights for Improved Healthspan”
- Role: Development of statistical analysis plan, simulations for sample size & precision calculations.

NIH Grant - Under Review*June 2024*

PI: John Batsis, M.D.

- Title: “Optimizing Incretin Therapies in Older Adults with Obesity and Type 2 Diabetes: Impact of Body Composition on Physical Function and Metabolic Health”
- Role: Development of statistical analysis plan, simulations for sample size & precision calculations.

Honors and Awards

- NSF travel award, Symposium on Data Science and Statistics *2023*
- NSF travel award, 3rd Annual Data Science Workshop *2023*
- Best poster award, 3rd Annual Data Science Workshop *2023*
- UNC Gillings Merit Scholar *2020-2021*

Service

- Volunteer Group Fitness Instructor, UNC Campus Recreation *Fall 2023*
- Poster Judge, Biostatistics Undergraduate Student Internships (BUSI) End-of-Summer Research Symposium *July 2023*
- Treasurer, Biostatistics Student Association *2021-2022*

Technical Skills**Programming Languages:** Python, R, SQL**Markup Languages:** \LaTeX , Microsoft Word/Excel**Translation Experience:** Spanish, Latin

Leadership & Additional Experience

MAA Project NExT

Community for New Experiences in Teaching

Cohort **Orange** '25

Certified Les Mills Group Exercise Instructor

BODYCOMBAT & BODYPUMP

2020-2024

- 4 years experience teaching group fitness classes

Voices, Chapel Hill Chorus

Member

2023-2024

Mettlesome Theater

Student of Improv 101, 201, and 301

2024

North Carolina Scrabble State Championships Finalist

June 2024

Current UNC Swim Club Record Holder

50 yard freestyle, 50 yard butterfly

Set 2021

Carnegie Mellon Varsity Swimmer

Senior Captain

2016-2020

6-Time NCAA Division III All-American

400 yard medley relay, 200, 400, 800 yard freestyle relay

2x 2019, 4x 2020

Former Carnegie Mellon School Record Holder

400 yard medley relay, 200, 400, 800 yard freestyle relays

Set 2017-2020, Broken by 2023

Former YMCA Long Course National Record Holder

400 meter freestyle relay

Set 2016, Broken 2024

3-Time YMCA Long Course National Champion

200 meter medley relay, 200, 400 meter freestyle relays

2016