

# Sam Hawke

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Personal Website



**Research Interests:** dimension reduction (sufficient, contrastive, and fair), interpretable machine learning, biostatistics, and statistics education

## 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

6. **Hawke S**, Zhang E, Chen J, Li D. "Contrastive Dimension Reduction: A Systematic Review." *WIREs Computational Statistics*. 2026.
5. Chen F, Belgique ST, **Hawke S**, Jackson C, Mitchell JD, Sullivan K, Boscardin CK, Willie C, Qaqish BF, Martinelli SM. "Professionalism Perceptions: A Comparison of Anesthesiology Trainees and Attendings." *Anesthesiology*. 2026 Feb 5;144(5):1216–1225.
4. **Hawke S**, Ma YE, Li D. "Contrastive Dimension Reduction: When and How?" *Thirty-Eighth Annual Conference on Neural Information Processing Systems (NeurIPS)*. 2024.
3. **Hawke S**, Luo H, Li D. "Contrastive Inverse Regression for Dimension Reduction." *New England Journal of Statistics in Data Science*. 2024.
2. Ciccone EJ, Zhu DR, Gunderson AK, **Hawke S**, Ajeen R, Lodge EK, Shook-Sa BE, et al. "Magnitude and Durability of the Antibody Response to mRNA-Based Vaccination Among SARS-CoV-2 Seronegative and Seropositive Health Care Personnel." *Open Forum Infectious Diseases*. 2024.
1. Boyce RM, Muhindo E, Baguma E, Muhindo R, Shem B, François R, **Hawke S**, 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

### Skidmore College

#### Spring 2026

- MS-204 (Statistical Methods)
- MS-251 (Applied Methods in Biostatistics)

#### 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*
- BIOS 660 (Probability and Statistical Inference I) *Fall 2022, Fall 2024*
- BIOS 600 (Principles of Statistical Inference) *Spring 2023*

### Carnegie Mellon University

#### Undergraduate Teaching Assistant

- 21-127 (Concepts of Mathematics) *Fall 2018, Fall 2019, Spring 2020*
- 21-111 (Differential and Integral Calculus) *Spring 2019*
- 21-241 (Matrices and Linear Transformations) *Fall 2017, Spring 2018*

### Art of Problem Solving

#### Teaching Assistant

- Introduction to Algebra A *Spring 2018*
- Probability and Combinatorics I *Summer 2018*

## Invited Talks

**Contrastive Inverse Regression for Dimension Reduction** *May 2026*  
Presented at *New England Statistical Symposium 2026*, Storrs, CT

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

## Contributed Talks

**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*

## Referee Experience

- **The American Statistician**
- **Scatterplot Journal**
- **Neural Information Processing Systems (NeurIPS)**
- **Proceedings of the National Academy of Sciences (PNAS)**

## Grants Supported

**Grant** *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***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***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***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:** L<sup>A</sup>T<sub>E</sub>X, Microsoft Word/Excel**Translation Experience:** Spanish, Latin

## Leadership & Additional Experience

<b>MAA Project NExT</b> Community for New Experiences in Teaching	Cohort <b>Orange</b> '25
<b>Certified Les Mills Group Exercise Instructor</b> BODYCOMBAT BODYPUMP	2020-Present 2022-Present
<b>Voices, Chapel Hill Chorus</b> Member	2023-2024
<b>MettleSome Theater</b> Student of Improv 101, 201, and 301	2024
<b>North Carolina Scrabble State Championships Finalist</b>	June 2024
<b>Current UNC Swim Club Record Holder</b> 50 yard freestyle, 50 yard butterfly	Set 2021
<b>Carnegie Mellon Varsity Swimmer</b> Senior Captain	2016-2020
<b>6-Time NCAA Division III All-American</b> 400 yard medley relay, 200, 400, 800 yard freestyle relay	2x 2019, 4x 2020
<b>Former Carnegie Mellon School Record Holder</b> 400 yard medley relay, 200, 400, 800 yard freestyle relays	Set 2017-2020, Broken 2023
<b>Former YMCA Long Course National Record Holder</b> 400 meter freestyle relay	Set 2016, Broken 2024
<b>3-Time YMCA Long Course National Champion</b> 200 meter medley relay, 200, 400 meter freestyle relays	2016