

Susan (Suzie) L. Hoops

Ph.D. Candidate

Saint Paul, MN

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INTERESTS

Bioinformatics, Multivariate statistics, Machine learning, Data visualization, Interdisciplinary environments

EDUCATION

Doctor of Philosophy, Computer Science (GPA 4.0)

Expected 2024

Master of Science, Computer Science (GPA 4.0)

2023

University of Minnesota-Twin Cities

Minneapolis, MN

Bachelor of Arts, Mathematics (GPA 3.57)

2017

St. Olaf College

Northfield, MN

RESEARCH EXPERIENCE

Graduate Research Assistant, Advisor: Dan Knights

Sep 2020-Present

University of Minnesota-Twin Cities, Computer Science & Engineering

Minneapolis, MN

- Directing microbiome analysis for an infant gut study collaboration with CHOP totaling 3,500 sequenced samples.
- Diagnosed origins of anomalies in dimensionality reduction (PCA/PCoA); produced a novel solution in R and Python.
- Advised 4 undergraduate researchers in our lab, guiding them through wet lab and computational techniques.

Data Scientist / Researcher 2, Knights Lab

Sep 2018-Aug 2020

University of Minnesota-Twin Cities, Computer Science & Engineering

Minneapolis, MN

- Lead microbiome sample preparation: 6,500 samples collected from 500 infants in Philadelphia (CHOP study).
- Developed statistical workflows in R and Python for disseminating gut microbiome findings in longitudinal studies of humans and primates, supporting 4 postdoc-lead studies in Knights Lab and other UMN labs.

Fulbright Student

Sep 2017-June 2018

Johannes Kepler Universität, Computer Sciences

Linz, Austria

- Visualized GitHub provenance as a graph using D3.js, advised by Professor Marc Streit at JKU Linz.
- Taught English in a local secondary school and took classes in the Technical Mathematics M.S. Program at JKU Linz.

Data Science Intern

May 2017-Aug 2017

CoreBiome (now Diversigen)

Saint Paul, MN

- Implemented custom microbiome analysis software on AWS using EC2 cloud computing and S3 storage.
- Created the original company website using Wix, developed interactive visualizations for clients in Python and D3.js.

SKILLS

Programming languages: Python, R, C++, MATLAB, SQL, LaTeX, JavaScript (D3.js library), HTML/CSS

Data Analysis: Machine learning models, Bioinformatics, Hypothesis testing, Data visualization, Multivariate analysis

Languages: English (native), German (conversational), American Sign Language (beginner)

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TEACHING EXPERIENCE

Graduate Teaching Assistant, Machine Learning Fundamentals (CS 5521)

Jan 2022-May 2022

Graduate Teaching Assistant, Computational Techniques for Genomics (CS 5481)

Sep 2022-Dec 2022

University of Minnesota-Twin Cities

Minneapolis, MN

- Debugging code and advising students on course concepts during office hours.
- Providing constructive feedback on assignments and diagnosing origins of mistakes in student code submissions.

Teaching Assistant, Computer Science for Scientists and Mathematicians (CS 125)

Feb 2016-May 2016

St. Olaf College

Northfield, MN

- Creating an interdisciplinary project in collaboration with a microbiology course, providing students with practical experience in (1) communicating with domain experts and (2) conducting research-based statistics.

LEADERSHIP & OUTREACH

Board Member, *Fulbright Association of Minnesota*

July 2019-July 2022

- Organizing chapter-wide events, bringing together Fulbright alumni and international students/scholars.
- Communicating events via the chapter email and social media pages, engaging local Fulbright alumni in the chapter.

Director of Finance, *Council of Graduate Students, University of Minnesota-Twin Cities*

July 2020-July 2021

- Budgeting funds (\$150k+ annually) which supported student travel grants, activities, and advocacy efforts.

President, *Habitat for Humanity, St. Olaf College*

Sep 2015-May 2017

- Planning volunteer builder and fundraising opportunities, facilitating student-led trips to sites around the USA.

Captain, *Women's Cross Country and Track & Field, St. Olaf College*

Sep 2015-May 2017

- Leading team activities, mentoring teammates, and opening communication between coaches and athletes.

AWARDS & GRANTS

Honorable Mention, *NSF Graduate Research Fellowship Program* (2021)

Fulbright Combined Award, *Fulbright Association* (2017)

MIAC Sportsmanship Award, *Minnesota Intercollegiate Athletic Conference* (2017)

Program Director of the Year, *St. Olaf College Leadership Awards* (2016)

PUBLICATIONS

Samara, J., ... **Hoops, S.**, ... and Arrieta, M. (2022). Supplementation with a probiotic mixture accelerates gut microbiome maturation and reduces intestinal inflammation in extremely preterm infants. *Cell Host & Microbe*, 30(5), 696-711.

Choi, Y., **Hoops, S. L.**, Thoma, C. J., & Johnson, A. J. (2022). A Guide to Dietary Pattern–Microbiome Data Integration. *The Journal of Nutrition*, 152(5), 1187-1199.

Vangay, P., ... **Hoops, S. L.**, ... & Knights, D. (2021) Industrialized Gut Microbiota Promote Intestinal Inflammation in Mice. Available at SSRN 3830019.

Ross, K. F., ... **Hoops, S. L.**, ... and Herzberg, M. C. (2021). Calprotectin (S100A8/A9) is an Innate Immune Effector in Experimental Periodontitis. *Infection and Immunity*. IAI-00122. <https://doi.org/10.1128/IAI.00122-21>

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Benny, P. A., ... **Hoops, S.**, Knights, D., and Garmire L. (2021). Placentas delivered by pre-pregnant obese women have reduced abundance and diversity in the microbiome. The FASEB Journal, 35.4, 0892-6638.
<https://doi.org/10.1096/fj.202002184RR>

Johnson, A. J., Zhou, S., **Hoops, S. L.**, ... and Nelson, A. C. (2021). Saliva testing is accurate for early-stage and presymptomatic COVID-19. medRxiv. <https://doi.org/10.1101/2021.03.03.21252830>

Joseph, N., Clayton, J. B., **Hoops, S. L.**, ... and Nordin, S. A. (2020). Alteration of the Gut Microbiome in Normal and Overweight School Children from Selangor with Lactobacillus Fermented Milk Administration. Evolutionary Bioinformatics, 16, 1176934320965943. <https://doi.org/10.1177/1176934320965943>

Clayton, J. B., Shields-Cutler, R. R., **Hoops, S. L.**, ... and Knights, D. (2019). Bacterial community structure and function distinguish gut sites in captive red-shanked doucs, Pygathrix nemaeus. American journal of primatology, 81(10-11), e22977. <https://doi.org/10.1002/ajp.22977>

POSTERS, PRESENTATIONS, AND LECTURES

- 2022 **Hoops S.** Microbiome beta diversity measures, visuals, and anomalies. **Guest Lecture**, MICE 5035, University of Minnesota Twin Cities. Minneapolis, MN. Oct 19 2022.
Hoops S. Uncovering gradients in microbiome arch effects. **Guest Lecture**, MICE 5035, University of Minnesota Twin Cities. Minneapolis, MN. Mar 2 2022.
- 2021 **Hoops S.** Recovering hidden gradients in microbiome diversity analyses. **Abstract Talk**, Microbiome Panel, Great Lakes Bioinformatics Conference 2021. Virtual. May 12 2021.
- 2020 **Hoops S.** The impact of Group B Streptococcus intrapartum antibiotic prophylaxis on the neonatal microbiome at 1-month age. **Panel Presenter**, Pediatric Academic Society Meeting 2020. Virtual. Aug 4, 2020.
Hoops S. Characterizing microbiome variation in longitudinal studies. **Invited Speaker**, BioFilm Club, University of Minnesota. Minneapolis, MN. Feb 21 2020.
- 2019 **Hoops S.** Houtti M. Data visualization with ggplot2. **Guest Lecture**, BIOC 5361, University of Minnesota. St. Paul, MN. Oct 31 2019.
Hoops S. Interpreting gradients in microbiome visualizations. **Selected Poster Talk**, Bioinformatics for the Microbiome Symposium 2019, Stanford University. Palo Alto, CA. Oct 28 2019.
- 2018 **Hoops S.** Streit M. Provenance tracking in JupyterLab. **Poster**, American Studies Conference 2018. Strobl, Austria. April 2018.
- 2017 Norberg Z, **Hoops S.** Pearce M, Dmytrenko S, Sanchez-Gonzalez R, Richey M. Analysis of high-speed gaseous flows using molecular tagging velocimetry and the Hough transform. **Poster**, National Conference on Undergraduate Research 2017. Memphis, TN. April 2017.
- 2016 Rives H, **Hoops S.** Richey M, Freedberg S. Identifying non-monophylogeny in phylogenetic trees. **Poster**, National Conference on Undergraduate Research 2016. Asheville, NC. April 2016.
- 2014 **Hoops S.** Purin M. Reversing directed graph edges yields inverse determinants. **Poster**, Honors Day, St. Olaf College. Northfield, MN. May 2014.

PEER REVIEWS

- mSystems, 2023, 1 article
- mSystems, 2022, 1 article
- PLOS Computational Biology, 2022, 1 article