Susan (Suzie) L. Hoops

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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, in collaboration with Marc Streit's lab 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)

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

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