Hannah W. Hafner

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EDUCATION

Smith College | Northampton, MA September 2022-May 2026
Bachelor of Arts in Neuroscience, Highest Honors Summa Cum Laude
Bachelor of Arts in Statistical and Data Sciences GPA: 4.00

Honors Thesis: "From Wiggle to Signal: Optimizing Functional Near-Infrared Spectroscopy Preprocessing for Young Children"

Denmark Institute for Study Abroad | Copenhagen, DK Spring 2025
Core Course: Cognitive Neuroscience of Creativity

RESEARCH AND TEACHING EXPERIENCE

Research Assistant | Mind in Development (MIND) Lab | Smith College, Northampton, MA
September 2023-May 2026 | P.I: Dr. Maya L. Rosen
Recruit families at community events to join the Deep OCEAN study which uses functional near-infrared spectroscopy (fNIRS) to explore how environmental experiences during childhood are associated with neurodevelopment. Run over 20 data collection sessions with 4 and 5-year-olds including behavioral tasks and fNIRS neuroimaging using stimulus presentation software PsychoPy and data acquisition software Aurora. Test 6 different motion correction methods on over 350 runs of fNIRS data in MATLAB as a part of honors thesis on determining the optimal motion correction algorithm for data from young children.

Research Assistant | Lab for Neural Computation & Cognition | Brown University, Providence, RI
June-August 2025 | P.I: Dr. Michael J. Frank
Aid in software development of the Hierarchical Sequential-Sampling Models (HSSM) Python package, which uses neural networks to enable efficient estimation of model parameters for sequential-sampling models. Create command-line-interface (CLI) pipeline in Python for use with HSSM. Enable CLI compatibility with Brown high-performance computing cluster. Provide tutorial documentation on the command-line-interface pipeline for other users. Generate simulations and train neural network on Race3 models to add to the HSSM package. Present at two research symposiums.

Research Assistant | Neurobiology Research Unit | Copenhagen, DK
January-May 2025 | P.I: Dr. Julian Macoveanu
Conduct literature review for project investigating moderate hypoxia and cognition training as a treatment for cognitive impairments associated with mood disorders. Conduct quality checks on 70+ T1-weighted MRI scans in FreeSurfer. Analyze data using linear mixed-models in R to determine the effect of the intervention on structural neuroplasticity. Results found that moderate hypoxia and cognition training did not have a significant effect on brain structure.

Grader | Department of Statistical and Data Sciences | Smith College, Northampton MA
September-December 2024
Grade weekly problem sets for two sections of SDS 291: Multiple Regression, covering topics including coding in R, simple linear regression, hypothesis testing, ANOVA, multiple regression, probabilities, odds ratios, and logistic regression.

HONORS

Excellence in STEM Outreach Award | 2026
- Awarded for an outstanding senior Smith STEM Ambassador for their consistent, loyal dedication to educating and serving the greater Northampton and Pioneer Valley community

Neuroscience Service Award | 2026
- Awarded to a senior major on the basis of a submitted description of the activities of that student in neuroscience outreach or service to our Smith community

STRIDE Research Fellowship | 2022-2026
- Awarded merit scholarship for Smith College and two-year paid research position

Summer Undergraduate Research Fellowship | 2024
- Awarded $6710 to continue research in the MIND Lab in Summer 2024

Dean's List | 2022-2024
- Awarded to students who are the top 25 percent of the student body based on the total records for the previous academic year

Excellence in General Chemistry in the First Year | 2023
- Awarded to first-year students with the highest academic averages in General Chemistry taken in the first semester

Arthur Ellis Hamm Prize | 2023
- Awarded annually to honor the members of the first-year class with the highest academic averages for the year

PUBLICATIONS

Sonya V. Troller-Renfree, Maya L. Rosen, Haleigh M. Brown, **Hannah W. Hafner**, Josué Rico-Picó, "Chapter 1: The Impact of Poverty on Brain Development." *(in press)*

April Perez-Moore, Danielle Abate, Winston Kennedy, Emma Burleigh, **Hannah W. Hafner**, Rebecca Drouhard, Victoria Rossetti, Sohye Kim, "Exploring Perinatal Indicators of Preterm Infant Social-Emotional Development" *(in press)*

PRESENTATIONS

Hannah Hafner, Catherine Mikkelsen, Maya L. Rosen, Optimizing Functional Near-Infrared Preprocessing for Young Children, Central and Western MA Chapter of Society for Neuroscience, Amherst, MA, April 2026

Hannah Hafner, Catherine Mikkelsen, Maya L. Rosen, Optimizing Functional Near-Infrared Preprocessing for Young Children, Smith College Celebrating Collaborations, Northampton, MA, April 2026

Annabelle Li, Catherine Mikkelsen, **Hannah Hafner**, Brianna McMillan, Maya L. Rosen, Parent-Child Neural Synchrony during Shared Problem-Solving: an fNIRS Study, Social and Affective Neuroscience Society, La Jolla, CA, April 2026

Hannah Hafner, Annabelle Li, Kris Cheaye, Lydia Jordan, Catherine Mikkelsen, Neural Encoding of Response Accuracy During Naturalistic Recognition Memory Task, Society for Neuroscience, San Diego, CA, November 2025

Hannah Hafner, Alexander Fengler, Krishn Bera, Michael J. Frank, Towards a User-Friendly Pipeline for Creating Arbitrary Likelihood-Free Models in HSSM, Brown University Summer Research Symposium, Providence, RI, August 2025

Hannah Hafner, Alexander Fengler, Krishn Bera, Michael J. Frank, Towards a User-Friendly Pipeline for Creating Arbitrary Likelihood-Free Models in HSSM, Virtual Leadership Alliance National Symposium, July 2025

Hannah Hafner, Suzanny Dias Kuhlmann, Julian Macoveanu, Effect of Moderate Hypoxia and Cognition Training on Brain Volume in Patients with Affective Disorders, DIS Festival, Copenhagen, DK, May 2025

Hannah Hafner, Annabelle Li, Kris Cheaye, Lydia Jordan, Catherine Mikkelsen, Single-Unit Recordings in the Human Brain During Recognition Memory Task, NEURON, North Haven, CT, April 2025

Hannah Hafner, Riko Mukoyama, Ela Narayan, Sharon Owino, Narendra Pathak, Effect of Adenosine A2A Antagonist SCH58261 on Hemorrhagic Stroke in *Danio rerio*. Smith College Celebrating Collaborations, Northampton, MA, April 2024

MEMBERSHIPS

Western Massachusetts Chapter of the Society for Neuroscience	April 2024-present
Student Advisory Committee for Faculty Hires in Neuroscience	November-December 2024
Nu Rho Psi	2024-present
Phi Beta Kappa	2026-present
Sigma Xi	2026-present
Mu Sigma Rho	2026-present

NEUROSCIENCE OUTREACH

STEAM Team Volunteer Coordinator | SYNAPTalks | Northampton, MA

September 2025-May 2026

Manage onboarding for 20 new volunteers on the STEAM team, which fosters opportunities for science outreach. Lead SynapTalks team of 5 to conduct podcast interviews of neuroscientists with a focus on Smith College alums. Coordinate interview logistics with prospective interviewees. Research backgrounds and generate interview questions about their career trajectories and research. Edit audio interviews and upload podcast episodes to Spotify. Run the SYNAPTalks Instagram to share our interviews and provide information about neuroscience with the larger community.

Department Liaison | Smith College Department of Neuroscience | Northampton, MA

September 2024-May 2026

Conduct the presentation of the major for the neuroscience department, covering courses, faculty, research, conferences, and study abroad. Provide underclassmen with advice to succeed in the neuroscience major. Host events and resources for students studying neuroscience at Smith. Host a 2-hour science communication talk and workshop for 20+ students with an invited science journalist speaker.

Teaching Assistant | Smith College Department of Neuroscience | Northampton, MA
January 2026-May 2026
Tutor students twice a week for NSC 210: Fundamentals of Neuroscience, with topics such as the membrane potential, action potential, neuroanatomy, motor functions, memory and sleep.

TECHNICAL SKILLS

MATLAB, Python (NumPy, Pandas, Scikit-learn, Matplotlib, Seaborn), R, Jupyter, GitHub, TidyVerse, PsychoPy, Aurora, REDCap

SUMMER SCHOOLS

Brown University — Carney Computational Modeling Workshop 2025
Neuromatch Academy — Computational Neuroscience 2024