

# Hailey L Johnson

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## Education

University of Wisconsin-Madison  
Doctor of Philosophy in Computer Science (NSF Fellow)

Sept. 2021-Current  
Madison, WI

University of Idaho  
Bachelor of Science in Computer Engineering

May 2019  
Moscow, ID

## Research Experience

### People and Robots Laboratory

*Research Assistant | Advisor: Dr. Bilge Mutlu*

May 2022 - Current  
Madison, WI

- Integrating interdependence into assistive technology design to increase usability and learnability for adults with Down syndrome.
- Collaborating on a speech recognition tool for communication sciences and disorders researchers, optimizing models for individuals with Down syndrome and integrating qualitative analysis features.
- Assessed privacy and security notification usability with adults with Down syndrome.
- Co-designed and developed assistive technology probes, including gamified and AR tablet applications and a tangible interface using Raspberry Pi systems.
- Completed a systematic scoping literature review on accessible technologies for adults with Down syndrome.
- Conducted semi-structured interviews with adults with Down syndrome, parents/guardians, and experts to investigate technology usage in context to their lived experiences.
- Conducted interviews and analyzed qualitative and quantitative data to explore user experiences with conversational agents and social media for individuals with traumatic brain injury.

### Wisconsin Wireless and NetworkinG Systems (WiNGS) Laboratory

*Graduate Student | Lab Professor: Dr. Suman Banerjee*

Nov. 2021 - May 2022  
Madison, WI

- Constructed nonlinear chirp waveform models for low-power LoRa (Long Range) communication systems to increase the possible number of connected devices in a network.
- Simulated nonlinear chirp waveform implementations in MATLAB and Python for future real-world testing and data collection.

### Speech Pathology Application (Sponsored by Micron)

*Project Manager | Project PI: Dr. Feng Li*

Aug. 2018 - May 2019  
Moscow, ID

- Developed a portable MySQL database with Java API to store child speech audio data for speech therapists and future artificial intelligence research.
- Scheduled milestones, monitored reporting, communicated with clients, and performed technical design review presentations.

### NASA Undergraduate Student Instrument Project

*Project Manager and Technical Lead | Project PI: Dr. Joseph Law*

Nov. 2015 - May 2018  
Moscow, ID

- Managed a team of multi-disciplinary undergraduate students to design, build, test, and fly three payload systems on high-altitude and low-altitude balloon platforms.
- Developed and tested atmospheric data collection, sensor communication, and data storage software for post-flight analysis.
- Created and maintained research schedules that met NASA design review standards while overseeing a \$200K budget.

## Work Experience

### University of Wisconsin - Madison

Teaching Assistant

Sept 2021 - May 2023

Madison, WI

- Created, edited, and graded labs, assignments, quizzes, and tests for CS640: Introduction to Computer Networking in Fall 2021 and Spring 2022. Provided Java debugging support for assignments and labs.
- Created, edited, and graded labs, assignments, quizzes, and tests for CS220: Data Science Programming 1, in fall 2022. Provided Python debugging support for assignments and labs.
- Held weekly office hours for students to ask questions on class materials and assignments.

### DCS Corporation

Computer Engineer II and Lab Manager

Aug. 2019 - Aug. 2021

Aberdeen, MD

- Designed and developed a multiplayer game in QT/C++ for human-agent teaming research to study how reaction time differences occur under situations of risk and ambiguity.
- Developed and tested a quantified uncertainty study in Qualtrics and Javascript to understand how information framing can enhance performance in computer-based training.
- Developed a human teaming virtual environment task in Unreal Engine/C++ to gain insight into remote human teaming communication through stressful situations.
- Managed the Innovation Commons lab space operations for Army Research Laboratories (ARL).

### Hewlett-Packard Incorporated

Firmware Engineering Intern

June 2018 - May 2019

Boise, ID

- Developed and tested memory configuration file generation command line tool for future print devices, increasing engineer productivity.
- Performed unit, system, and engine testing on various developed printer firmware drivers.

### NASA Ames Summer Intern

Engineering Intern on TechEdSat project

June 2017 - Aug. 2017

Moffett Field, CA

- Practiced Cube Satellite design, integration, and NASA's quality assurance procedures.
- Participated in two professional presentations and published a scientific poster on the TechEdSat passive Exo-Brake for cube satellite atmosphere reentrance.

## Publications

- Johnson, H. L., Spalitta, H., Kim, C. Y., & Mutlu, B. (2026, April). Supporting Money Management among Adults with Down Syndrome: A Multi-Technology Probe Study. In *Proceedings of the 2026 CHI Conference on Human Factors in Computing Systems* (pp. 1-20). 2026
- Heinz-Jakobs, M., Görmez, S., Johnson, H. L., Gerken, J., Pascher, M., Barbareschi, G., ... & Röcker, C. (2025, October). AT@ Work: Intelligent Assistive Technologies for Enabling Workplace Inclusion. In *Proceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility* (pp. 1-5). 2025
- L. Johnson, H., & Mutlu, B. (2025). Accessible Technology for Adults with Down Syndrome: A Scoping Review. *ACM Transactions on Accessible Computing*, 18(3), 1-57. 2025
- Johnson, H. L. (2025). Technology Supports for Adults with Down Syndrome. *ACM SIGACCESS Accessibility and Computing*, (139), 1-1. 2025
- Johnson, H. L., Sterling, A., & Mutlu, B. (2024, May). "It Is Easy Using My Apps:" Understanding Technology Use and Needs of Adults with Down Syndrome. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (pp. 1-17). 2024

Hu, Y., Lim, H., Kakonge, L., Mitchell, J. T., Johnson, H. L., Turkstra, L. S., ... & Mutlu, B. (2024, October). SMART-TBI: Design and evaluation of the Social Media Accessibility and Rehabilitation Toolkit for users with traumatic brain injury. In *Proceedings of the 26th International ACM SIGACCESS Conference on Computers and Accessibility* (pp. 1-19). 2024

Hu, Y., Lim, H., Johnson, H. L., O'Shaughnessy, J. M., Kakonge, L., Turkstra, L., ... & Mutlu, B. (2023, October). Investigating Day-to-day Experiences with Conversational Agents by Users with Traumatic Brain Injury. In *Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility* (pp. 1-15). 2023

## Grants and Awards

ACM ASSETS 2024 Doctoral Consortium	Oct. 2024
<b>National Science Foundation Graduate Research Fellowship Program</b>	April 2023
University of Wisconsin-Madison Fall Competition Grant	Dec. 2023
Outstanding Senior, University of Idaho Department of Electrical and Computer Engineering	May 2019
2018 PepsiCo/Society of Women Engineers Student Engineering Challenge, 2nd place award	Oct. 2018
Computer Engineer of the Year, University of Idaho Department of Electrical and Computer Engineering	May 2018
NASA Undergraduate Student Instrument Project (USIP) Grant, \$200,000	May 2016

## Teaching and Volunteer Experience

**CS571: Building User Interfaces** March 6, 2025  
*Accessibility Lecture* Madison, WI

Prepared and presented two 95-min lectures on accessibility in user interface design to ~300 students.

**CS220: Introduction to Python** Sept. 2022 - May 2023  
*Teaching Assistant* Madison, WI

Facilitated weekly python programming labs with ~30 university students, developed quiz questions, and held weekly office hours.

**CS640: Intro to Computer Networks** Sept. 2021 - May 2022  
*Teaching Assistant* Madison, WI

Held weekly office hours, and proctored exams at Epic.

**Gigi's Playhouse Madison** June 2022-Sept.2023  
*Volunteer* Madison, WI

Participate in the weekly social group, Fantastic Friends, for adults with Down syndrome.