

RESEARCH INTERESTS

Interaction design for Human-computer interaction (HCI) and Human-robot interaction (HRI)
Field experiments
Qualitative analysis

EDUCATION

Cornell Tech September 2019 - Present (expected graduation: 2023)
Ph.D. Candidate, Information Science

- Thesis: What robots need from clothes to improve human-robot interaction
- Committee: Wendy Ju, Guy Hoffman, and Denise Green

Cornell Tech May 2019
M.S., Applied Information Science (Technion) & M.S., Information Systems (Cornell)

University of California, Santa Cruz - Santa Cruz, California May 2018
B.S., Cognitive Science with an emphasis on Human-Computer Interaction

INDUSTRY RESEARCH EXPERIENCE

Farming, Watsonville, CA June 2021 - August 2021
UX Research Intern

Start-up building an open source, low-cost, collaborative electric tractor specifically designed for the market farmer to increase the efficiency and enjoyment of various tasks on the small farm - from bed prep to harvest.

- Conducted wizard of oz study to qualitatively assess how farmers use the robot.
- Communicated with customers about their farm needs to apply to the robot
- Documented robot build for future engineers

MITRE, Bedford, MA June 2020 - October 2021
Autonomy Intern

A not-for-profit organization that manages federally funded research and development centers supporting several U.S. government agencies.

- Synthesized literature to improve observability in an acquisition software application.
- Annotated and analyzed transcripts from an Online Dispute Resolution software application
- Conducted qualitative research on interviews with facilitators.

SAMSUNG AI CENTER, Montreal, QC May 2019 - August 2019
Human-Robot Interaction Research Intern

A research and development center focusing on Artificial Intelligence, localization, and social robotics.

- Designed studies to understand robot politeness using multi-modal features for a robot
- Conducted studies in the field by recruiting participants, operating robots, and distributing questionnaires.
- Analyzed quantitative (Likert scale) results and qualitative analysis (video coding)

NATALIE FRIEDMAN

ANKI, San Francisco, CA

June 2018 - August 2018

UX Research Intern*A consumer electronics company that creates robots that "move you" through home entertainment.*

Consumer Insights, User Experience Research Intern

- Synthesized usability research from playtests per robot feature
- Analyzed user perception data
- Created videos displaying users' perceptions to inform UX designers' and engineers' work.

SAVIOKE, San Jose, CA

June 2017 - September 2017

UX Research Intern*Designs, manufactures and deploys robots to service industries, including hospitality, healthcare, and logistics.*

User Experience Research, Product Intern

- Wrote a recommendation book on Human-Robot Interaction to inform future design
- Conducted observational user research at hotel sites to inform storyboard iterations
- Produced in-house storyboarding with users on service recovery scenarios and resolutions
- Studied literature review and returned design implications for the service robot

ACADEMIC RESEARCH EXPERIENCE

CORNELL TECH, NEW YORK, NY

Future Automation Research, Research Assistant

August 2018 - Present

Assist Dr. Wendy Ju with literature review, study design, and protocol for projects including:

- Collaborate with fashion designers to evaluate functional clothing for robots
- Dress robots in clothes using the DALL-E2 AI model to imagine new functions of robots
- Collaborate with a Human-Experience and Team-Oriented Technology Lab at Technion University to design and run a cross-cultural driving study.
- Prototype robot motion, collect perceptions via Mechanical Turk, and qualitatively and quantitatively analyze responses.
- Design and run needfinding interviews and design activities about devices that people with Tetraplegia use to design appropriate voice-activated systems

UNIVERSITY OF CALIFORNIA, SANTA CRUZ, CA

Re-embodied Cognition Lab, Research Assistant

March 2017 - June 2018

Assist Dr. Leila Takayama with literature review, study design, and project protocol, including a senior thesis:

Achieving a Feeling of Mobility and Exploration Through Telepresence.

- Collaborated with a Human-Robot Interaction lab, The Assistive Technology lab, The Stroke and Disability Learning Center, and The Seymour Marine Discovery Center to enable stroke patients to explore an aquarium remotely.
- Managed a team of 5 undergraduates to conduct a literature review on Human-robot interaction topics, including telepresence, embodiment, stroke survivors, and mobility therapy for the team to design and run experiment protocol.

NATALIE FRIEDMAN

ASSIST Lab, *Research Assistant*

December 2015 - June 2018

Assist Dr. Sri Kurniawan's team in exploring assistive socio-technical solutions for individuals with special needs using technology. Worked on *Spokeit: A speech therapy application*, and *Vizsnap: a photo application for the blind*

- Transcribed and coded audio data from patients who have cleft palate speech impairments
- Analyzed critiques from users and developed themes
- Ran usability tests and presented study designs to contribute to new iterations of the speech therapy application's original version, *Speech with Sam*

BAR ILAN UNIVERSITY, ISRAEL

Personal Information Management, *Research Assistant*

November 2017 - June 2018

Assist Dr. Ofer Bergman's team in designing a system of variables and conditions within the field of Personal Information Management for academic researchers to utilize:

- Used Structured Query Language to manage data in the field of Personal Information Management
- Read a breadth of Personal Information Management literature and assigned variables and conditions to groups.

Human-Computer Interaction Lab, *Research Assistant*

June 2016 - June 2017

Administering experiments for Professor Steve Whittaker and PhD student Charlotte Massey to support their research on the relationship between emotions and the user's organization of digital information

- Conducted user research with up to 100 volunteer participants
- Instructed participants to watch an emotionally triggering video, administer surveys, and instruct them to organize and retrieve digital files

TEACHING

Grader: Mobile Human-Robot Interaction Design (Information Science 6755)

Cornell Tech, Spring 2023

Mentoring masters students through the development of HRI studies (36 graduate students)

Teaching Assistant: Human-Computer Interaction and Design (Information Science 6410)

Cornell Tech, Fall 2022 and 2021

Teaching masters students the foundations of HCI through interactive activities (150 graduate students)

Teaching Assistant: Developing and Designing Interactive Devices (Information Science 5345)

Cornell Tech, Spring 2020

Guiding graduate students to learn about designing devices using sensors, actuators, Arduino, and Raspberry Pi (40 graduate students)

MENTORING

Bella Baidak, Cornell Tech, Connective Media, Masters student, 2023

Alexandra Bremers, Cornell Tech, Information Science, Ph.D. student, 2022- 2023

Xy Fang, Cornell Tech, Connective Media, Masters student, 2022

Asmita Mehta, Indian Institute of Technology, Textile and Fibre Engineering, Bachelors student 2022 - 2023

Awsaf Ahmed, Brooklyn Tech, High School Student 2022-2023

Stacey Li, Cornell Tech, Information Science, Ph.D. student, 2021-2023

NATALIE FRIEDMAN

Kristy Chen, Cornell Tech, Connective Media, Masters student, 2021 - 2022

Hyein Baek, Cornell Tech, Connective Media, Masters student, 2021 - 2022

Carmel Zolkov, Technion, Work Safety and Human Engineering, Masters Student 2020-2021

Talia Wise, Technion, Work Safety and Human Engineering, Masters Student 2020-2021

Navit Alalouf, Technion, Work Safety and Human Engineering, Masters Student 2020-2021

PUBLICATIONS

Natalie **Friedman**, Asmita Mehta, and Wendy Ju. "Utility belt for an agricultural robot: Reflections on performing design research in the field." HRI 2023, In *18th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. IEEE.

Natalie **Friedman**, Patricia L. McDermott, and Jeff Stanley. "Supporting Observability through Social Cues." CENTRIC 2021, The Fourteenth International Conference on Advances in Human-oriented and Personalized Mechanisms, Technologies, and Services (2021): 8. [PDF](#)

David Goedicke, Carmel Zolkov, Natalie **Friedman**, Talia Wise, Avi Parush, Wendy Ju, Strangers in a StrangeLand. "Strangers in a Strange Land: New Experimental System for Understanding Driving Culture using VR" In *IEEE Transactions on Vehicular Technology Special Issue on Immersive Virtual Reality simulation for Vehicular Technology*. 2022. [PDF](#).

Natalie **Friedman**, Kari Love, Ray LC, Jenny Sabin, Guy Hoffman, Wendy Ju. "What Robots Need From Clothes." In *Proceedings of the 2021 conference on Designing Interactive Systems (DIS '21)*, June 28-July 2, 2021, Nowhere and Everywhere, USA. ACM, New York, NY, USA, 11 pages. [PDF](#).

Natalie **Friedman**, Kari Love, Alexandra Bremers, AJ Parry, Ray LC, Bolor Amgalan, Jen Liu, Wendy Ju. Workshop: Designing Functional Clothing for Human-robot Interaction, In Companion of the 2021 ACM/IEEE International Conference on Human-Robot Interaction (HRI '21 Companion), March 8–11, 2021, Boulder, CO, USA. ACM, New York, NY, USA, 3 pages. [PDF](#).

J.D. Zamfirescu-Pereira, David Sirkin, David Goedicke, RAY LC, Natalie **Friedman**, Ilan Mandel, Nikolas Martelaro, and Wendy Ju. 2021. Fake It to Make It: Exploratory Prototyping in HRI. In the Companion of the 2021 ACM/IEEE International Conference on Human-Robot Interaction (HRI '21 Companion), March 8–11, 2021, Boulder, CO, USA. ACM, New York, NY, USA, 10 pages. [PDF](#).

Wendy Ju, Sharon Yavo-Ayalon, Ilan Mandel, Federico Saldarini, Natalie **Friedman**, Srinath Sibi, J.D. Zamfirescu-Pereira, Jorge Ortiz. 2020. Tracking Urban Mobility and Occupancy under Social Distancing Policy. In *Proceedings of the Digital Government: Research and Practice*. Digit. Gov.: Res. Pract., Vol 37, No. 4., Article 111., (August 2020), 8 pages. [PDF](#).

Natalie **Friedman**, David Goedicke, Vincent Zhang, Dmitriy Rivkin, Michael Jenkin, Ziedune Degutyte, Arlene Astell, Xue Liu, Gregory Dudek, Active Vision Human Robot Collaboration Workshop: Out of my way! Exploring Different Modalities for Robots to Ask People to Move Out of the Way, In *Proceedings of RO-MANN'20*, (RO-MANN'20). ACM, Virtual Event, USA. **Best Paper Award. [PDF](#)

Marcel Walch, Stacey Li, Ilan Mandel, David Goedicke, Natalie **Friedman**, Wendy Ju, Work In Progress: Crosswalk Cooperation: A Phone-Integrated Driver-Vehicle Cooperation Approach to Predict the Crossing Intentions of Pedestrians in Automated Driving, In *Proceedings of AutomotiveUI '20*, (AutoUI'20). ACM, Virtual Event, USA. [PDF](#).

NATALIE FRIEDMAN

Ray LC, Natalie **Friedman**, J.D. Zamfirescu-Pereira, Wendy Ju. The Forgotten In HRI Workshop Position: Agents of Spatial Influence: Designing incidental interactions with arrangements and gestures. In Proceedings of HRI '20, (HRI '20). ACM, New York, NY, USA. [PDF](#).

Natalie **Friedman**. Art Meets Tech Workshop Position: Robot Readability and Video Prototyping. In Proceedings of CHI '20, (CHI '20). ACM, New York, NY, USA. [PDF](#).

Natalie **Friedman**, David Goedicke, Vincent Zhang, Dmitriy Rivkin, Michael Jenkin, Ziedune Degutyte, Arlene Astell, Xue Liu, Gregory Dudek. Integrating Multidisciplinary Approaches to Advance Physical Human-Robot Interaction Workshop: Capturing Attention With Wind. In ICRA 2020. [PDF](#).

Natalie **Friedman**, Andrea Cuadra, Ruchi Patel, Shiri Azenkot, Joel Stein & Wendy Ju. 2019. Voice Assistant Strategies and Opportunities for People with Tetraplegia. In Proceedings of the 21st International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '19). ACM, Pittsburgh, PA, USA, [PDF](#).

Natalie **Friedman**. 2018. Using a Telepresence Robot to Improve Self-Efficacy of People with Developmental Disabilities. In Proceedings of the 20th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '18). ACM, Galway, Ireland, [PDF](#).

Jared Duval, Zachary Rubin, Elena Márquez Segura, Natalie **Friedman**, Milla Zlatanov, Louise Yang, and Sri Kurniawan. 2018. Spokelt: building a mobile speech therapy experience. In Proceedings of the 20th International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI '18). ACM, New York, NY, USA, Article 50, 12 pages. [PDF](#).

Adams, D., Kurniawan, S., Herrera, C., Kang, V., & **Friedman**, N. 2016. Blind Photographers and VizSnap. In Proceedings of the 18th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '16). Reno, Nevada, USA. [PDF](#).

PRESENTATIONS

2023 "My design process: designing a dancing robot.", [10XBeta](#), NewLabs

2022 "Designing a Utility Belt for an Agricultural Robot," [Sketching in Hardware](#), Theme: Reboot

2022 "What Robots Need From Clothes, for Business," [Stern TechCon](#), NYU MBA Conference

2021 "What Robots Need From Clothes," [Social Emotional Technology Lab](#), UC Santa Cruz

2021 "Using Personality to Support Observability", IARIA CENTRIC, track: Design and Synthesis of Personalities

2021 "Dressing a Robot Arm" [Robotics Graduate Student Organization](#), Cornell

2021 "Are robots naked? Make robots better robots through clothing design," co-led: Kari Love, [ITP Camp](#), NYU

2021 "What Robots Need From Clothes," [Designing Interactive Systems '21](#)

2021 "Clothes for Robots," [Pressman Academy](#)

2020 "What Robots Need from Clothes," [Robotics Seminar](#), Cornell University

2020 "What Robots Need from Clothes," [Sketching and Hardware](#)

2018 "Using a Telepresence Robot to Improve Self-Efficacy of People with Developmental Disabilities", Student Research Competition Finalist, [ASSETS](#)

2018 "Using a Telepresence Robot to Improve Self-Efficacy of People with Developmental Disabilities", Poster Presenter, [Seymour Marine Discovery Center](#)

2018 "Using a Telepresence Robot to Improve Self-Efficacy of People with Developmental Disabilities", Poster Presenter, University of California, Santa Cruz, Psi Chi

2018 "Using a Telepresence Robot to Improve Self-Efficacy of People with Developmental Disabilities", Poster Presenter, University of California, Santa Cruz, [Koret Poster Session](#)

NATALIE FRIEDMAN

2017 “Internships in the field of Human-Computer Interaction” Panelist, Human Factors, University of California, Santa Cruz

PRESS

2021 [Why every robot needs a spiffy hat](#), Engadget

2021 [Do Robots Need Clothes?](#), Cornell Tech

AWARDS & HONORS

2021 \Art Micro Grant Award for Draping on Robots. \$500.

2020 AVHRC2020 Best Poster Paper Award

2020 \Art Micro Grant Award for Materials and Robots. \$500.

2020 NSF Research Fellowship Program (GRFP) Honorable Mention

2018 - 2019 Cornell Merit Scholarship, Cornell Tech. \$27,500.

2018 Student Research Competition 1st Place: ACM International Conference on Computers and Accessibility (ASSETS). \$500.

2018 Koret Scholarship: Increasing Accessibility to the Seymour Marine Center through Telepresence, UCSC undergraduate research support. \$1,000.

2018 Outstanding Researcher Award, Psychology Department, University of California, Santa Cruz

2018 - Present Phi Beta Kappa member

2014 - 2018 Dean's List: 5 quarters, University of California, Santa Cruz

SKILLS

Research Methods: Research through design, literature review, interviews, questionnaires, personas, storyboards

Programming: Python, SQL

Certifications: Internal Review Board CITI training

Design: Adobe Illustrator, Adobe Photoshop, Adobe XD, WordPress, Sketch, InVision

Languages: English, Hebrew

ACTIVITIES

2022 Diversity and Inclusion Co-Chair, Designing Interactive Systems '22

2021 Diversity and Inclusion Co-Chair, Designing Interactive Systems '21

2021 Teaching Girl Scouts How to Build Drawing Robot, Cornell Tech

2020 Teaching Girl Scouts How to Build a Waving Paper Robot, Cornell Tech

2019 Student Volunteer, ACM conference on Designing Interactive Systems (DIS)

2018 Grader, Universal Access: Disability, Technology and Society, UCSC

2016 - 2018 Volunteer, Student Health Outreach and Promotion, UCSC

2014 - 2018 Board Member, Writer, Art Director, Leviathan Jewish Journal, UCSC