

Houston Claire

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U.S. Citizen

Education

Yale University, New Haven, CT

Postdoc

Department of Computer Science

2023 - Present

Cornell University, Ithaca, NY

PhD Student, Sloan Fellow

Department of Mechanical Engineering, PhD Minor: Computer Science

2016 - 2023

Cornell University, Ithaca, NY

M.S. in Mechanical Engineering, Minors: Computer Science

2016 - 2020

The Pennsylvania State University- University Park, State College, PA

B.S. in Mechanical Engineering, Bunton-Waller Fellow

2011 - 2015

Employment

Modlee Ai- Machine Learning Researcher Intern

August 2023 – Present

I work as a part of the machine learning research team for the startup. I work on different aspects of research and development for the product as well as supporting in the development of pitch decks. The startup recently received pre-seed funding and took part of TechStars in Boston.

Toyota Research Institute (TRI) – Research Intern

June 2021 - August 2021

Worked as part of the UX Robotics team (RUX-ID) where I developed my own research project on how robotic platforms can co-exist with humans in the home. I leveraged both quantitative and qualitative methods (interviews) to test my hypotheses. Results were presented to the internal Robotics Machine Learning team where they will work to apply my findings into their system. Results may be published in the future.

Clubes de Ciencias(Santa Cruz, Bolivia) – Instructor

June 2016 - 2023

Developed a one week course for high achieving college and high school Bolivian students and taught the class in Spanish. The course entailed artificial intelligence, robotics, and human -robot interaction. Clubs de Ciencias is a program that looks to develop a scientific community within the country and inspire high school and college students to pursue a STEM related field.

Louis Stokes Alliance for Minority Participation (LSAMP): Graduate Coordinator *June - August 2017*
Mentored undergraduate underrepresented students interested in pursuing a doctoral or graduate degree. Developed workshops to teach students how to write effective research papers. Had one-on-one meetings with students to guide them in creating their research posters and research presentation.

Johnson & Johnson Co-op: Ethicon, Inc., Facilities Engineer *January - May 2013*
Involved in various projects including drafting, renovation of various rooms and machines. Helped supervisor identify various problems with machines and innovate solutions to ensure that the factory ran smoothly.

Publications

- 1) **Claire, H.**, Candon, K., Vázquez, M. 2024. Dynamic Fairness Perceptions in Human-Robot Interaction. *ACM SIGCHI Conference on Computer-Supported Cooperative Work & Social Computing (CSCW)*. Submitted.
- 2) **Claire, H.**, 2024. Designing for Fairness in Human-Robot Interactions. *Robotics: Science and Systems (RSS) – Pioneers Workshop*.
- 3) **Claire, H.**, Shin, I., Trafton, G., Vázquez M. 2024. The Fairness in Human-Robot Interactions Scale (F-HRI) Development and Validation. *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. In Preparation.
- 4) **Claire, H.**, Narcomey, A., Vázquez M. 2024. Fairness Theory: Modeling Reduced Welfare in Human-Robot Interactions. *ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. In Preparation.
- 5) Narcomey, A., **Claire, H.**, Vázquez M. 2024. Robot Delivery of Actionable Counterfactual Neural Network Explanations: Results in Group Perception. *Conference on Robot Learning (CORL)*. Submitted.
- 6) **Claire, H.**, Candon, K., Clark, O., Vázquez, M. 2024. Multiplayer Space Invaders: A Platform for Studying Evolving Fairness Perceptions in Human-Robot Interaction". *Companion of the ACM/IEEE International Conference on Human-Robot Interaction (HRI)*.
- 7) **Claire, H.**, Kim, S., Kizilcec, R., & Jung, M. 2023. The Social Consequences of Machine Allocation Behavior: Fairness, Interpersonal Perceptions and Performance. *Computers in Human Behavior*.
- 8) **Claire, H.**, Chang, M.L., Kim, S., Omeiza, D., Bando, M., Lee, M., Jung, M. 2022. Fairness and Transparency in Human-Robot Interaction. *Companion of the ACM/IEEE International Conference on Human-Robot Interaction*.
- 9) **Claire, H.**, Jung, M. 2021. Fairness Considerations for Enhanced Team Collaboration. *Companion of the 2021 ACM/IEEE International Conference on Human-Robot Interaction (HRI Pioneers 2021)*.

- 10) Lee,W.,Sakashita,M., Ricci,E., **Claire,H.**,Jung,M., Guimbretiere,F. 2021. Interactive Vignettes: Enabling Large-Scale Interactive HRI Research. *30th IEEE International Conference on Robot & Human Interactive Communication (RO-MAN)*.
- 11) **Claire, H.**, Chen,Y., Modi, J.,Jung, M., Nikolaidis,S. 2020. Multi-Armed Bandits with Fairness Constraints for Distributing Resources to Human Teammates. *2020 ACM/IEEE International Conference on Human-Robot Interaction*.
- 12) **Claire, H.**, Khojasteh,N., Tennet,H., Jung, M. 2020. Using Expectancy Violations Theory to Understand Robot Touch Interpretation. *Companion of the 2020 ACM/IEEE International Conference on Human - Robot Interaction*.
- 13) **Claire, H.*** ,Barrieros, J.* , Peele, B.* , Shepherd, R. 2018. Fluid Elastic Actuators for Haptic Interactions in Virtual Reality. *IEEE Robotics and Automation Letters (RA-L)*. (*Authors Contributed Equally).
- 14) Stogin,B., Gockowski, L., Feldstein, H., **Claire, H.**, Wang, J., Wong, T. 2018. Free-standing liquid membranes as unusual particle separators. *Science Advances*.
- 15) **Claire, H.**, Jung, M. 2018. Understanding Social Dynamics in Robot -Human Handovers Through the Lens of Expectancy Violations Theory. *Companion of the ACM/IEEE 2018 Conference on Human-Robot Interaction (HRI)*.
- 16) Shen, S.,Tennent,H.,**Claire, H.**, Jung, M. 2018. My Telepresence, My Culture? An Intercultural Investigation of Telepresence Robot Operators' Interpersonal Distance Behaviors. *Conference on Human Factors in Computing Systems(CHI)*.
- 17) **Claire, H.**, Jung, M. 2018. Understanding Social Dynamics in Robot -Human Handovers Through the Lens of Expectancy Violations Theory. *Companion of the ACM/IEEE 2018 Conference on Human-Robot Interaction (HRI)*.

Entrepreneurship

Vida - The Artificial Intelligent Companion, Founder

February 2020 – January 2021

National Science Foundation I-Corp Grant Recipient. Co-authored a grant and received a \$50,000 to explore commercialization opportunities for my research and to start a company. I led the company (6 members) to complete 100+ customer discovery interviews within the educational technology (edtech) space and worked with industry mentors and CEOs to develop a business model canvas for the company.

Teaching

- 1.) *Ubiquitous Computing (Teaching Assistant)*, Fall 2019 - Designed and developed Machine Learning, Machine Perception, Signal Processing, Human Computer Interaction, as well as psychology and sociology laboratories and had students implement them in Jupyter Notebooks. Helped students with independent project developing new persuasive technologies.

- 2.) *Mechatronics (Teaching Assistant)*, Fall 2018 - Helped teach an upper level engineering course at Cornell. I helped organize and develop lab experiments where students learned about analog electronics (filter design, circuits, transistors, etc.) as well as microprocessors and programming with C. I also helped students design, build, and program a microprocessor-controlled robot for a block placing competition using the C programming language.
- 3.) *Instructor of Social Robots Course*, 2018 - 2019- Developed course to teach high school students about the field of Human Robot Interaction. Presented course at Bolivian Embassy in Washington D.C. and Santa Cruz, Bolivia as part of Clubes de Ciencias Program.

Talks

- 1.) Claire, Houston B. (2024). Air Force Office of Scientific Research (AFOSR) Program Review. "Towards Robots that reason About Fairness". Air Force Office of Scientific Research (AFOSR).
- 2.) Claire, Houston B. (2024). Workshop talk. "Designing for Fairness in Human Robot Interactions". RSS Pioneers Workshop.
- 3.) Claire, Houston B. (2023). Invited Podcast Guest. "Designing Fair Robots". Tech Policy Press. 2023.
- 4.) Claire, Houston B. (2023). Invited Podcast Guest. "Designing Fair Robots". Quantum Photonics. 2023.
- 5.) Claire, Houston B. (2023). Invited Lecturer. "The Design of Everyday Things". CPSC-484/584 Intro. to Human-Computer Interaction. 2023.
- 6.) Claire, Houston B. (2023). Invited Presentation. "Designing Fair Robots". Yale Young Global Scholars. 2023.
- 7.) Claire, Houston B. (2022). Invited Research Presentation. "Designing Fair Robots". Robotics Presentation. Yale University. 2022.
- 8.) Claire, Houston B. (2022). Invited Research Presentation. "Designing Fair Robots". MIT Teaching Systems Lab (TSL). Massachusetts Institute of Technology (MIT). 2022.
- 9.) Claire, Houston B. (2021). Seminar Presentation. "Fairness Considerations for Enhanced Team Collaboration". Rochester Institute of Technology (RIT). September 2021.
- 10.) Claire, Houston B. (2021). Brown Bag Lunch Presentation. "Fairness Considerations for Enhanced Team Collaboration". Toyota Research Institute (TRI). June 2021.
- 11.) Claire, Houston B. (2021). HRI Pioneers Presentation. "Fairness Considerations for Enhanced Team Collaboration". 2021 ACM/IEEE International Conference on Human-Robot Interaction (Virtual Conference). March 2021.

- 12.) Claire, Houston B. (2019). Workshop Presentation. "Reinforcement Learning with Fairness Constraints for Resource Distribution in Human-Robot Teams". Sibley Graduate Student Symposium. Ithaca, New York. September 2019.
- 13.) Claire, Houston B. (2018). Workshop Presentation. "Understanding Social Dynamics in Robot - Human Handovers Through the Lens of Expectancy Violations Theory". Human Robot Interaction(HRI) Conference '18 .Workshop on Longitudinal Human-Robot Teaming. Chicago, Illinois. March 2018.
- 14.) Conference Attendee (By Invitation). Institute on Teaching and Mentoring. Tampa, Florida. October 27 - 30,2016.
- 15.) Claire, Houston B. (2014). Technical Presentation. "Evolution Inspired Optimization of Soap Film Robustness". McNair Summer Research Symposium. Penn State University. July 27, 2015.
- 16.) Claire, Houston B. (2014). Technical Presentation. "Evolution Inspired Optimization of Soap Film Robustness". National McNair Conference. University of Maryland - Baltimore County. September 12, 2015.
- 17.) Claire, Houston B. (2014). Poster Presentaion."Variable Stiffness". Society of Hispanic of Professional Engineers(SHPE)- National Conference. Detroit, Michigan. November 7,2014.
- 18.) Claire, Houston B. (2014). Poster Presentation and Technical Presentation. "Variable Stiffness Actuators". Undergraduate Summer Research Symposium. Cornell University. August 7, 2014.
- 19.) Claire, Houston B. (2014). Poster Presentation and Technical Presentation. "Variable Stiffness Actuators". Undergraduate Summer Research Symposium. Cornell University. August 7, 2014.
- 20.) Claire, Houston B. (2013). Poster Presentation. "Nanoscale Motor Using a Multiferroic System". Pennsylvania TRIO Conference. The Pennsylvania State University, University Park. October 17, 2013.

Honors and Awards

- Sloan Scholars Network – Travel Grant* 2024
 Selected to receive a \$2,000 travel grant to attend a conference of choice.
- Robotics: Science and Systems (RSS)- Pioneers Workshop* 2024
 Recognized as a pioneer in robotics and selected as one of 30 participants worldwide for RSS Pioneers, an intensive workshop for top senior Ph.D. students and early-career researchers in robotics. Part of the RSS conference.
- NextProf Nexus- University of Michigan, Georgia Tech, UC Berkeley* August 2024
 Selected to participate in a workshop to prepare researchers for a faculty position.

Future Faculty Program- Rochester Institute of Technology (RIT) *September 2021*
Selected to participate in RIT's future faculty program. I was invited to present my research in a seminar and interviewed with various faculty and deans from the schools of mechanical engineering and computing and information sciences.

Edward Bouchet Graduate Honor Society *February 2021*
One of five Ph.D. students selected across the graduate school at Cornell to be inducted into the 2021 cohort of scholars at Yale University.

Conference on Human-Robot Interaction(HRI)- Pioneers Workshop *2021*
Recognized as an early career pioneer in the field of human-robot interaction and selected as one of 18 participants worldwide for HRI Pioneers, an intensive workshop for top senior Ph.D. researchers in robotics and human-robot interaction. Part of the HRI conference.

Commercialization Fellowship *March-December 2021*
One of seven Ph.D. students selected from the school of engineering to explore market potential for a research project that has been published.

Cornell Digital Agriculture Hackathon- Winner (Novelty Prize) *February 2020*
Was part of a team that looked to develop a process to create an eco-friendly and healthy probiotic drink from the waste product of a plant. I worked to apply machine learning algorithms to facilitate the process of gathering the waste product. Our team was one of the five winning teams selected for the \$1,500 prize from 150 participants from institutions around the world.

National Science Foundation Graduate Fellowship (NSGRF) - Honorable Mention *2018*

Sloan Fellowship *August 2016- 2023*
Three-year fellowship support to pursue a Ph.D. in a STEM discipline. Funded by the Alfred P. Sloan Foundation and the Cornell Graduate School.

Diversity Programs in Engineering(DPE) Cornell- Graduate Student of The Month *October 2018*

Engineering Capstone Design Showcase- 2nd Place *August - December 2015*
Project was awarded 2nd place overall among 77 engineering senior capstone groups. The project successfully integrated an Oculus Rift to a robotic headform. Due to sensors placed on the Oculus Rift, the headform was able to synchronously mimic the user's head movement

Bunton-Waller Fellowship *May 2011 - 2015*
Prestigious full-tuition scholarship to Pennsylvania State University-University Park. Students are considered upon applying to the university and tuition is funded for 8 semesters.

McNair Research Scholar *2015*
Received funding to pursue a summer research project of choice and participated in mentorship programs to prepare for graduate school.

Society of Hispanic Professional Engineers(SHPE) National Conference Poster Finalist November 2014
Selected finalist amongst undergraduate students throughout universities across the United States.
Presented poster at the SHPE National Conference in Detroit, Michigan.

Research Experience

Interactive Machines Group (IMG) February 2023 – Present
I develop methods for interpreting, modeling, and learning domain-specific information from interactions with humans in small team settings.

Robots in Groups Lab October 2016 - January 2023
My research combines robot decision-making with the psychology of fairness and human group dynamics to enable more effective collaboration within mixed teams of humans and robots.

ICAROS Lab (Visiting Researcher) January - August 2019
Developed a constrained multi armed bandit algorithm with regret bounds proofs to investigate the impact of perceived fairness in resource distribution within multi human-robot teams. Algorithm was experimented on a human team using a cooperative Tetris game that we developed. We also applied the algorithm on a vehicular robot and experimented applying the robot on human teams. Project included the development and testing of the algorithm, developing and leading the creation of a cooperative Tetris game using JavaScript and programming the control for the vehicular robot and vision system using Python and ArUco markers. This work was completed as a collaboration with the ICAROS lab at the University of Southern California(USC).

Collaboration with Organic Robotics Lab October 2017- February 2018
Developed and ran a user study that investigated the impact of a novel haptic sleeve on users developed for virtual reality controllers. Helped develop motion profiles for the new controller using C++ and Python and analyzed data using R software. This work was a collaboration with the Organic Robotics Laboratory and Nvidia.

Wong Laboratory for Nature Inspired Engineering January 2014 - December 2015
The goal of my project was to characterize the water droplets on Slippery Rough Surfaces(SRS). SRS are nature inspired surfaces which are created by altering the surface of a substrate at the nano level and adding a lubricant layer. Work included measuring the contact angle and understanding whether the droplet will observe to be in the Wentzel or Cassie State. Data was collected through a goniometer. Work and data collected will be used to submit a paper in the future resulting in co authorship.

Penn State University, McNair Summer Research Program June - August 2015
The goal was to successfully demonstrate that genetic algorithm known as Differential Evolution could be used for material design. Work included: 1) fabricate an autonomous set up that would accurately allow the testing of soap film robustness, 2.) conduct research on and compile a list of chemicals that will be used to fabricate soap films, 3.) conduct robustness experiments and gather data until convergence is observed.

Ronald E. McNair Program- Scholar

August 2013 - December 2015

Competitive and selective program that offers guidance and assistance to a selected group of students that have shown interest in pursuing graduate school.

Cornell University, Organic Robotic Lab

Summer 2014

Conducted an independent project with assistance of graduate mentor on a silicone pneumatic actuator with variable stiffness. Successfully fabricated an actuator that was able to be electrically controlled. Gave a presentation and presented a poster at the Cornell Diversity Undergraduate Symposium. Funded by the Louis Stokes Alliance for Minority Participation (LSAMP).

Cornell University, Translational Applications of Nanoscale Multiferroic Systems (TANMS) *Summer 2013*

Conducted research about nanoscale motors using a multiferroic system. Simulated various situations and phenomena that the nano motor would be exposed to and learned a deposition technique using the Pulsed Laser Deposition(PLD).

Leadership Experience

Graduate and Professional Student Assembly(GPSA)-Field Representative

November 2016 - 2017

One of the two representatives for the department of Mechanical Engineering. GPSA gathers representatives from among the 7,000 students to address non-academic issues and collaborate with university administration to help bring positive change to the university.

Volunteer Work

Los Angeles Mission

2019

Helped distribute food to members of Skid Row in Los Angeles, California.

Loaves & Fishes of Tompkins County

2016 - 2023

Helped clean up and distribute food to members of Tompkins County.

Catholic Faith Center- Front Desk Volunteer

2015