Ceara Byrne

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I engineer intelligent interfaces that decode latent states and behaviors, creating adaptive models that respond in real time to proactively deliver actionable insights for care, automate monitoring, and optimize decision-making workflows across clinical, research, and caregiving contexts.

Education

Research Scientist **~2026**

Massachusetts Institute of Technology, Cambridge, MA
School of Mechanical Engineering.

Postdoctoral Fellow **2021-2024**

Massachusetts Institute of Technology, Cambridge, MA
School of Mechanical Engineering.
PI: Dr. Giovanni Traverso

Doctor of Philosophy in Computer Science **2021**

Georgia Institute of Technology, Atlanta, GA
Title of Dissertation: WIDGETS: Wireless, Interactive Devices for Gauging and Evaluating Temperaments for Working and Service Dogs.
Co-Advised: Dr. Melody Jackson and Dr. Thad Starner

Master of Science in Human Computer Interaction **2015**

Georgia Institute of Technology, Atlanta, GA
Project: A Method to Evaluate Haptic Interfaces for Working Dogs
Advisor: Dr. Melody Jackson

Master of Science in Industrial Design **2015**

Georgia Institute of Technology, Atlanta, GA
Thesis: Design of an e-Textile sleeve for tracking knee rehabilitation for older adults
Advisor: Dr. Claudia Rebolá

Certificate in Sustainable Design **2009 - Present**

University of California, Berkeley, CA

Bachelor of Science in Industrial Design **2006**

Georgia Institute of Technology, Atlanta, GA
Specialized in Biomechanics, Human Factors, and Usability

Awards and Honors

2023 CI Fellowship: 1 year extension of award

2021 Computing Innovation (CI) Fellowship: Highly competitive fellowship (~15% acceptance rate)

2020 Foley Scholar: One of three Georgia Tech PhD students awarded for personal vision and potential impact

2019 Haley Fellow

2019 EECS Rising Star: Funded participant in highly selective workshop for women pursuing academic careers

2019 Foley Scholar Finalist

2015 College of Computing Outstanding Researcher Award: Awarded to the best research within the first year CS PhD cohort

2015 Featured in Georgia Tech's Research Horizons: article on "The Heart of Innovation" for my work on IoT and connected devices

2012 GTRIC Innovation Competition Semi-Finalist

Research Experience

Postdoctoral Researcher & Research Scientist — Sept 2021 – Present

Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA
Department of Gastroenterology, Brigham and Women's Hospital, Cambridge, MA

A Learning Framework for Implantable and Ingestible Electronics

PI: Giovanni Traverso

Research areas: closed-loop implantable and ingestible device design, EEG, gut-brain axis, continual learning, activity characterization

Graduate Research Assistant — Aug 2013 – Aug 2021

Animal Computer Interaction Lab, Georgia Institute of Technology, Atlanta, GA
BrainLab, Georgia Institute of Technology, Atlanta, GA

Rapid Prototyping of In-Ear EEG Electrodes for Steady State Visually Evoked Potentials (SSVEP): NSF Funded
FIDO (Facilitating Interactions for Dogs with Occupations): DARPA funded

PIs: Melody Jackson and Thad Starner

Research areas: animal computer interaction, sensing in objects, play behavior, brain computer interfaces

RDO Research Internship — Summer 2019

Working Dog Center, University of Pennsylvania School of Veterinary Medicine
PIs: Cindy Otto, Jenny Essler

Research areas: applied behavioral science, qualitative and quantitative analysis

Undergraduate Research Assistant — May 2005 – May 2006

Georgia Institute of Technology, Atlanta, GA

Designing Seating for Older Adults and for Patients with Spinal Cord Injuries

PIs: Stephen Sprigle

Research areas: usability testing, expert reviews & human factor analyses

Publications

Peer-Reviewed Journal Papers

Ceara Byrne*, Jason Li*, Jia Y. Liang*, SeJun Lee, Mille Kronborg Lyhne, Anika Meng, Susan Rui Ling, Shiyi Li, Aaron Lopes, Parmiss Khosravi, Colin Cotter, Yuyan Su, Johannes Josef Fels, Jacob W. Coffey, Alison Hayward, Andreas Vegge, Ulrik Rahbek, Stephen T. Buckley, Robert Langer, Giovanni Traverso. (2025) *Kinetics of Hypoglycemia in Diabetes Patients Informs Development of New Modes of Glucagon Therapy*. In Submission.

Alvin Chan, Ameya R. Kirtane, Qing Rui Qu, ..., **Ceara Byrne**, Giovanni Traverso. (2025). *Designing lipid nanoparticles using a transformer-based neural network*. Nature Nanotechnology, pp.1-11.

Srinivasan, S,. Alshareef, A., Hwang, A,. **Byrne, C.,** Kuosmann, J., Ishida, K., Jenkins, J., Liu, S., Madani, W., Hayward, A., Fabian, N., Traverso, G. (2023). *A vibrating ingestible bioelectronic stimulator modulates gastric stretch receptors for illusory satiety*. Science Advances, 9(51), eadj3003.

Byrne, C., Starner, T., & Jackson, M. (2022). *Quantifying canine interactions with smart toys assesses suitability for service dog work*. Frontiers in Veterinary Science, 9, 886941.

Waghmare, A., Xue, Q., Zhang, D., Zhao, Y., Mittal, S., Arora, N., **Byrne, C**., Starner, T., & Abowd, G. D. (2020). *UbiquiTouch: Self Sustaining Ubiquitous Touch Interfaces*. Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, 4(1), 1-22.

Byrne, C., Zuerndorfer, J., Freil, L., Han, X., Sirolly, A., Gilliland, S., Starner, T., & Jackson, M. (2018). *Predicting the Suitability of Service Animals Using Instrumented Dog Toys*. Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, 1(4), 127.

Byrne, C., Kerwin, R., Zuerndorfer, J., Gilliland, S., Guo, Z., Jackson, M., & Starner, T. E. (2014). *Two-way communication between working dogs and their handlers*. IEEE Pervasive Computing, 13(2), 80-83.

Byrne, C., Freil, L., Starner, T., & Jackson, M. M. (2017). *A method to evaluate haptic interfaces for working dogs. International Journal of Human-Computer Studies*, 98, 196-207.

Peer-Reviewed Conference Papers

Byrne, C.*, Karl, S.*, Vilker, D., Meller, S., Thompson, B., & Webber, S. (2020, November). *Monitoring the welfare of bears in captivity*. In Proceedings of the Seventh International Conference on Animal-Computer Interaction (pp. 1-6).

Byrne, C., Logas, J., Freil, L., Allen, C., Baltrusaitis, M., Nguyen, V., Saad, C., & Jackson, M., (2019). *Dog Driven Robot: Towards Quantifying Problem-Solving Abilities in Dogs*. In Proceedings of the Sixth International Conference on Animal-Computer Interaction. ACM.

Byrne, C., Zeagler, C., Freil, L., Rapoport, A., Jackson, M. (2018). *Dogs Using Touchscreens in the Home: A Case Study for Assistance Dogs Operating Emergency Notification Systems*. In Proceedings of the Fifth International Conference on Animal-Computer Interaction. ACM.

Zeagler, C., **Byrne, C.**, Valentin, G., Freil, L., Kidder, E., Crouch, J., Starner, Thad, & Jackson, M. M. (2016, November). *Search and rescue: dog and handler collaboration through wearable and mobile interfaces*. In Proceedings of the Third International Conference on Animal-Computer Interaction (p. 6). ACM.

Byrne, C. A., Rebola, C. B., & Zeagler, C. (2013, September). *Design Research Methods to Understand User Needs for an eTextile Knee Sleeve*. In Proceedings of the 31st ACM international conference on Design of communication, 17-22.

Magazine Articles

Vishkaie, R., Pereira, M., Perry, M., Raptis, G., Candello, H., & **Byrne, C.** (2020). *Understanding and improving SIGCHI's volunteer experience*. Interactions, *27*(5), 80-80.

Books and Book Chapters

Byrne, C. *Engaging Non-Human Species in Using Technologies: Strategies for Acclimation, Training, and Autonomous Use of Technology.* Computing Technology, Animal Welfare and Human-Animal Relations. (Under review).

Byrne, C., & Logas, J. (2021). *The future of technology and computers in veterinary medicine.* Diagnostics and Therapy in Veterinary Dermatology, 245-250.

Freil, L.**, Byrne, C.**, Valentin, G., Zeagler, C., Roberts, D., Starner, T., & Jackson, M. (2017). *Canine-Centered Computing*. Foundations and Trends® in Human–Computer Interaction, 10(2), 87-164.

Theses

Byrne, C. A. (2021). *WIDGETs: Wireless Interactive Devices for Gauging and Evaluating Temperament for Service and Working Dogs*.

Byrne, C. A. (2013). *Design of an e-Textile sleeve for tracking knee rehabilitation for older adults.*

Invited Talks

Closing the Loop on Sleep Mitigation for Critical Professions

2025 Program Reviews and Biohybrid Devices Meeting, Houston

Ingestible Devices: Sensing in the GI Tract for Actionable Insights

2025 Georgia Tech

Rising Stars In CS Lecture Series

2023 UMass Amherst

Instrumenting Toys and Quantifying Canine Object-Play Behavior

2021 Northwestern University

2021 Animal Centered Computing Summer School, Saint Petersburg Electrotechnical University and University of Haifa

Technology for Working and Service Dogs

2021 GVU Brown Bag, Georgia Institute of Technology

Instrumented Toys for Predicting Placement of Service and Working Dogs

2019 University of Haifa

Teaching Experience

Instructor of Record

Semester	Course	Title	Enrollment	Notes
Spring 2020	CS/PSYC3650	User Interface Design	85	Project-based course
Summer 2018	CS/PSYC3750	User Interface Design	12	Project-based course
Summer 2016	CS/PSYC3750	User Interface Design	27	Project-based course

Teaching Assistant

Semester	Course	Title	Enrollment	Notes
Fall 2018	CS/PSYC3750	User Interface Design	75	Head TA / Lectured
Fall 2015	CS/PSYC3750	User Interface Design	75	Lectured
Fall 2014	ID2401	Visual Design Thinking	23	Lectured
Spring 2014	CS7470/ID4833	Mobile and Ubiquitous Computing	80	
Fall 2013	COA 1060	Design Research	80 / Section: 13	
Spring 2013	ID/Arch	ID and Architecture History	198	Head TA
Fall 2012	COA 1060	Design Research	80 / Section: 15	
Spring 2012	ID/Arch	ID and Architecture History	197	Head TA
Fall 2011	ID/Arch	ID and Architecture History	197	Head TA

Guest Lectures

History and Challenges of Wearable Computing, Georgia Tech (2018, 2020, 2021)

Invited Workshops

Designing and developing wearable computers for animals. Animal Computer Interaction conference 2023.

Mentoring

PhD Research Mentor

2025 Golda Gershanok, Massachusetts Institute of Technology, Harvard University
2025 Ian Ballinger, Massachusetts Institute of Technology
2022 Adam Gierlach, Massachusetts Institute of Technology

Masters' Research Mentor

2023 - 2024 Giovanni Cherubini, ETH Zurich
2023 - 2024 Coen Berns, Technical University of Delft
2023 - 2024 Xintong (Abby) Tong, ETH Zurich
2022 - 2023 Mariela Perez-Cabarcas, Massachusetts Institute of Technology

Undergraduate Research Mentor

2023 - Present Kevin Haoze Deng, University of Toronto
2021 - Present Omkar Ghenand, Massachusetts Institute of Technology
2022 - Present Harrison Sun, Northeastern University
2022 - 2023 Beatrice Bihui Chen, University of Toronto
2022 Evan Thompson, Harvard University
2017 - 2018 Allison Rapoport, Georgia Institute of Technology

Doctoral Consortium Mentor

2021 Nareed Hashem, University of Haifa, Animal Computer Interaction, won Best Student Presentation

Industry Employment History

UX Engineer Intern, Maps, Search, and Identity **May – Aug 2017**

Google, Mountain View, CA

Indoor Mapping UX/UI

- Crafted hypotheses and methods for capturing indoor user patterns that combined human activity recognition and patterns of human behavior. Filed for invention disclosure.
- Developed an Android application for collecting necessary data.
- Analyzed user data and investigated methods for automatically visualizing indoor user patterns.

Technical Intern, Ecosystems and Innovation **May – Aug 2015**

AT&T Foundry, Atlanta, GA

Front-End Developer

- Designed and developed the UX for AT&T's Domain 2.0, the virtualization of AT&T's networks, enabling AT&T network services and infrastructure to be used, provisioned, and orchestrated as is typical of cloud services in data centers.
- Implemented pre-created, personalized image distributions for LXC and Ubuntu images for LXD through the GUI using Node-Red, nodeJS, HTML, and CSS.
- Leveraged websockets for back-end communication to distinct uVerse features.

Technical Intern, Ecosystems and Innovation **May 2014 – May 2015**

AT&T Foundry, Atlanta, GA

Usability researcher and user experience designer for Connected Car and Digital Life products

- Composed 1 formative study, independently conducted 2 full, formative usability studies (~12 participants each), analyzed 6 formative and summative studies, & organized 1 readout for clients.
- Lead UX design for a novel Connected Car portal, head unit, and mobile application.

User Experience Intern **June – Dec 2013**

Isobar, Chicago, IL

User experience designer and usability test coordinator for 3 intern-driven digital media projects

- Lead UX design for MIT Media Lab's Member Connect Mobile Application reaching ~140 members - iPhone & Android platforms.
- Designed UX for a novel, in-house ideation tool to encourage brainstorming in corporate environments, which underwent 2 rounds of usability testing and is currently the standard for ideation and brainstorming sessions in the Chicago office.
- Developed a wearable keypad to supplement Google Glass.

Design Research Intern, Concept Team **May – Aug 2012**

Milwaukee Electric Tool, Milwaukee, WI

Design researcher for the concept group and advanced engineering teams to enable product expansion into new hand tool markets

- Leveraged Human-Centered Design Methods, such as contextual interviews, "Day in the Life of", and competitive analyses to break into the market for 20+ new hand tool products.
- Used wireframing & process flow analysis for mobile development to enhance Milwaukee Electric Tool radio experience.
- Developed a full-day research protocol for TTI's Asia Office to rethink the design and development of 2 potential new market products.

Product Design Consultant **Mar 2011 – Aug 2011**

Pottery Barn Teen Division & Martin Sprouse Furniture, San Francisco, CA

Concept designer branching into new product lines

- Led the design development of pieces from sketch concept through revision to final product.
- Created graphical visualizations of 6 new office products from initial ideation through final concept for Zynga.

Product Designer **Dec 2007 – Dec 2010**

Project Frog, Inc., San Francisco, CA

Design and management of several major product lines within the Frog modular, sustainable building system

- Collaborated extensively with manufacturers, structural engineering consultants, supply chain & construction teams.
- Used Arena PLM software to manage product life cycle and documentation from concept & revisions through production.

Professional Affiliations

ACM, IEEE, and SIGCHI Student Member, LEED Accredited Professional since 2009.

Professional Activities

Organizing Committees

2025	Emerging Work Co-Chair for Animal Computer Interaction Conference
2023, 2024	Program Co-Chair for Animal Computer Interaction Conference
2021	Proceedings Co-Chair and Digital Sociability Chair for Animal Computer Interaction Conference

Steering Committee

2024, 2025 Animal Computer Interaction

Additional Committees

2019 - 2020 SIGCHI Officer: Volunteer Development Team Lead

2018 Georgia Tech GSC Travel Committee

2018 Volunteer Coordinator for Animal Computer Interaction conference

Journal Reviewer

2023 Frontiers in Veterinary Sciences

2023 Interactive, Mobile, Wearable, and Ubiquitous Technologies

2021 Brain Sciences

2020 Multimodal Technologies and Interactions

Conference Reviewer

2021, 2023, 2024 The ACM CHI Conference on Human Factors in Computing Systems (CHI); *Special recognition 2023, 2024*

2022 Designing Interactive Systems (DIS); *Special recognition*

2022 Conference on Intelligent Surfaces and Spaces

2019 - 2022 The International Conference on Animal-Computer Interaction

2019 The International Symposium for Wearable Computing

2017 The ACM CHI Conference on Human Factors in Computing Systems Late Breaking Work

Grant Reviewer

2022 Agence Nationale de la Recherche

Outreach

2018 - 2020 Interactive Product Design Lab (IPDL) mentor

2018 - 2019 Girls Who Code