Emily Tseng

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Research Interests

I study how we can use computational tools to design new systems of caregiving in mental and behavioral health that augment the capabilities of frontline caregivers. Using methods from *human-computer interaction*, *machine learning* and *computer security and privacy,* I design, build, deploy and evaluate novel computing systems in real-world care contexts. My goal is to widen access to health services for marginalized people.

Education

2019 - present   *Ph.D. student, Information Science,* Cornell University
Advised by Deborah Estrin and Nicola Dell.

2017 - 2019   *M.S. Information Systems, Health Tech specialization,* Cornell Tech   GPA: 3.9/4.0
Relevant coursework: Applied Machine Learning, Deep Learning, Natural Language Processing, Human-Computer Interaction, Interactive Device Design.
Advised by Deborah Estrin and Nicola Dell.

2010 - 2014   *B.A. Ecology & Evolutionary Biology,* Princeton University   GPA: 3.5/4.0
Concentration in Global Health and Health Policy. Studied epidemiology, journalism and social policy with a focus on predictive modeling of infectious disease epidemics.
Advised by Bryan Grenfell and Tiffany Bogich.

Publications

1. Bellini, R., **Tseng, E.,** McDonald, N., Greenstadt, R., McCoy, D., Ristenpart, T. and Dell, N. *"So-called privacy breeds evil": Narrative Justifications for Intimate Partner Surveillance in Online Forums.* Proceedings of the ACM on Human-Computer Interaction, Issue CSCW. 2020. (Accepted).

2. **Tseng, E.**, Bellini, R., McDonald, N., Danos, M., Greenstadt, R., McCoy, D., Dell, N. and Ristenpart, T. 2020. *The Tools and Tactics Used in Intimate Partner Surveillance: An Analysis of Online Infidelity Forums.* 29th USENIX Security Symposium. pdf. online.
Distinguished Paper Award.
Internet Defense Prize, third prize.

3. Sterling, MR, **Tseng, E,** Poon, A, Cho, J, Avgar, AC, Kern, LM, Ankuda, CK, Dell, N. *Experiences of Home Health Care Workers in New York City During the Coronavirus Disease 2019 Pandemic: A Qualitative Analysis..* JAMA Internal Medicine. Published online August 04, 2020. pdf. Online.

4. **Tseng, E.,** Okeke, F., Sterling, M., and Dell, N. *"We can learn. Why not?": Designing Technologies to Engender Equity for Home Health Aides.* ACM Conference on Human Factors in Computing Systems (CHI 2020). pdf. online.

5. Sterling, M. R., Dell, N., Piantella, B., Cho, J., Kaur, H., **Tseng, E.,** Okeke, F., Brown, M., Leung, P. B. K., Silva, A. F. , Shaw, A. L., Kern, L. M. 2020. *Understanding the Workflow of Home Healthcare for Patients with Heart Failure: Challenges and Opportunities.* Journal of General Internal Medicine. pdf. online.

6. Freed, D.*, Havron, S.*, **Tseng, E.,** Gallardo A., Chatterjee, R., Ristenpart, T., and Dell, N.. 2019. *"Is my phone hacked?" Analyzing Clinical Computer Security Interventions with Survivors of Intimate Partner Violence.* Proceedings of the ACM on Human-Computer Interaction: Vol. 3, Issue CSCW, Article 202. pdf. online.
    Best Paper Honorable Mention.

7. Okeke, F., **Tseng, E.,** Piantella, B., Brown, M., Kaur, H., Sterling, M., and Dell, N. 2019. *Technology, Home Health Care, and Heart Failure: A Qualitative Analysis with Multiple Stakeholders.* ACM SIGCAS Conference on Computing & Sustainable Societies (COMPASS 2019). pdf. online.

Awards & Honors

2020	Distinguished Paper Award, USENIX Security Symposium
2020	Facebook/USENIX Internet Defense Prize, Third Place
2020	CRA-WP Grad Cohort for Women
2019	Best Paper Honorable Mention, ACM CSCW
2019	Advocate of New York City Award *Recognition from the Mayor's Office to End Domestic & Gender-Based Violence.*
2019	Cornell University Information Science Department Fellowship *One-year doctoral fellowship awarded for exceptional preparation & promise (top 1.5% of applicants).*
2017	Cornell Tech Merit Scholarship *Two-year merit award for Master's-level study.*
2014	Senior Thesis Award - Modeling, Princeton University Department of Ecology & Evolutionary Biology *Recognition for that year's top senior thesis with a primary focus on mathematical modeling.*
2014	Society of Sigma Xi (scientific research honor society), Princeton University

Current Research

Understanding working alliance in online psychotherapy
PIs: Tanzeem Choudhury, Ph.D., Cristian Danescu-Niculescu-Mizil, Ph.D., Deborah Estrin, Ph.D. (Cornell Tech)
-   Investigating the use of generative modeling techniques to understand how working alliance manifests, develops, and dissipates on a widely used platform for text-based psychotherapy.

Understanding online abuser communities in intimate partner surveillance (IPS)
PIs: Nicola Dell, Ph.D. and Thomas Ristenpart, Ph.D. (Cornell Tech)
-   Built a web scraping pipeline collecting data from public forums where abusers discuss IPS tactics.
-   Analyzed how these forums manifest specific tactics and narrative justifications for abuse **[2,3].**

Clinical computer security for victims and survivors of IPV
PIs: Nicola Dell, Ph.D. and Thomas Ristenpart, Ph.D. (Cornell Tech)
- Conducting a field study of a "tech clinic" intervention for victims of IPV in New York City, in partnership with the Mayor's Office to End Domestic and Gender-Based Violence. **[1,7]**

Community-engaged technology design to support home health aides caring for adults with heart failure
PIs: Nicola Dell, Ph.D. (Cornell Tech), Madeline Sterling, M.D. M.P.H. (Weill Cornell Medicine)
- Performed qualitative analysis of interviews with 50+ aides, nurses, physicians, social workers and agency leaders to understand the technology ecosystem around the home care of heart failure **[6,8]**.
- Synthesized results into a functional prototype used in a participatory design study with aides, nurses, and other stakeholders to elicit how aides might use technology to achieve equity goals **[5]**.
- Interviewed 20+ aides working in New York City during pandemic lockdowns in spring 2020 to understand how COVID-19 has affected their experiences **[4]**.

Past Research
Extracting family history from unstructured clinical notes
- Developed a statistical model (LSTM-CRF) extracting family history information from unstructured text in patient information questionnaires.
- Awarded student travel grant to present at the OHNLP/BioCreativ workshop at ACM-BCB 2018.

Evaluating the usability of a personal data filtering interface
PI: Deborah Estrin, Ph.D. (Cornell Tech)
- Conducted a Mechanical Turk experiment evaluating the usability of an interface for filtering sensitive data from a user's Google Takeout export.

Prototyping a tool for real-time smartphone-based mood tracking
PI: JP Pollak, Ph.D. (Cornell Tech)
- Prototyped and tested an intentive computing tool for logging emotional states in real time.
- Used interviews and observational studies to examine its usability and utility in managing generalized and subthreshold anxiety.

Modeling the dynamics of enterovirus-71 in Taiwan: An application of the TSIR model
PI: Bryan Grenfell, Ph.D. (Princeton University)
- Developed a time-series model of the impact of vaccination on EV-71 infection rates in Taiwan.
- Awarded departmental prize for excellence in mathematical modeling [poster].

Teaching and Mentoring
Cornell Tech, New York, NY

Teaching Assistant, INFO 6410 / CS 5682: HCI & Design, Professor Nicola Dell	Fall 2019, 2020
Research Internship Supervisor, Cornell Tech Summer Intern Program	Summer 2020
Teaching Assistant, INFO 6940: Technology & Social Justice, Professor Nicola Dell	Spring 2020
Research Internship Supervisor, Technion + Cornell Tech Intern Program	Fall 2019
Grader, CS 5740: Natural Language Processing, Professor Yoav Artzi	Spring 2019
Lead Teaching Assistant, Product Studio, Professor Deborah Estrin	Fall 2018

Weill Cornell Medical College, New York, NY

Guest Lecturer, HCPL 8101: Digital Health, Professor Deborah Estrin   Summer 2020

    Introduction to Human-Centered Design

    Tech for Caregivers: Changing care by centering home health aides in technology [slides]

Fullstack Academy, New York, NY

Software Engineering Teaching Fellow   Summer 2017

- Taught and mentored 80+ students at a selective software engineering bootcamp.
- Delivered 10-minute talk on inclusive design and web accessibility: https://youtu.be/NQP8yg81KZ8

Talks

The Tools and Tactics of Intimate Partner Surveillance - Facebook Research   2020

Technology in Frontline Caregiving - Precision Behavioral Health Initiative, Cornell Tech   2020

The Tools and Tactics of Intimate Partner Surveillance - 29th USENIX Security Symposium   2020

Technology to Engender Equity for Home Health Aides - CHI '20 (canceled due to COVID-19)   2020

Relevant Work Experience

Pfizer, Inc., New York, NY

Summer Associate   Summer 2018

- Led a team of UX researchers and technologists to synthesize user stories, product requirements and storyboards for a care navigation product addressing health disparities within the Welsh NHS.
- Interviewed domain experts on the feasibility of a consumer voice product for patient support.

Biomeme, Inc., Philadelphia, PA

Product & Business Development Associate   2014 - 2016

- Developed an at-home sexual health diagnostic for a national reproductive healthcare provider.
- Developed a point-of-care influenza diagnostic with a federal disease control agency, resulting in a pilot program in a clinic network in Nairobi, Kenya.
- Conducted UX studies to guide development of a consumer-facing tool for personal DNA analysis.

Oxford University Clinical Research Unit (OUCRU), Ho Chi Minh City, Vietnam

Research Intern   Summer 2013

- Conducted literature reviews, performed data analyses (R) and mapped patient enrollment (GIS, Illustrator) for ongoing clinical studies at a tertiary tuberculosis hospital.
- Funded by the Center for Health & Wellbeing at Princeton University.

Doctors Without Borders / Medecins Sans Frontieres (MSF), New York, NY

Editorial & Multimedia Intern   Summer 2011, 2012

- Produced audio, video & web features on MSF field staff at humanitarian aid sites worldwide.

The Daily Princetonian, Princeton, NJ

Managing Editor   2013 - 2014

- Led 100+ staff of a collegiate news organization publishing in print 5x/week and online 24/7.
- Built web and data journalism departments, and expanded the paper's multimedia capabilities.

Additional Leadership and Service

PhDs At Cornell Tech (PACT), *2020 Co-President*
Elected to co-lead the PhD students' association at Cornell Tech. Sets agenda for student initiatives, organizes and presides over PACT meetings, and represents Cornell Tech PhD student interests to the school administration and broader University assemblies.

Information Science Graduate Students' Association (ISGSA), *2020-21 Cornell Tech Liaison*
Represents the interests of Cornell Tech-based students to the broader Information Science community.

HealthTech.NYC, *2018-19 Co-Organizer*
Curated a speaker series for engineers, designers, and clinicians in the NYC health tech ecosystem.

Venture for America, *2014 Fellow*
Elected to the 2016-17 Alumni Board to support programs widening access to entrepreneurship.

Skills

- **Human-Centered Design** | Interviewing, contextual enquiry, survey design, thematic analysis, prototyping (Sketch, Photoshop, Illustrator, InDesign, InVision)

- **Data Science** | Quantitative analysis and statistical modeling (Python, R, MATLAB), modern machine learning (scikit-learn, Dynet, Tensorflow, Pytorch)

- **Software Development** | Full-stack software engineering (JavaScript, Node.JS, React, HTML, CSS/Sass), Agile development, cloud deployment tools (AWS, Heroku)

- **Communication** | Writing, editing, public speaking, multimedia production (audio and video)

- **Research** | Literature review, study protocol design, IRB submission, paper-writing