

# Pardis Paris Miri, PhD

Postdoctoral Research Fellow, Stanford University

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Pardis Miri, PhD, is a postdoctoral fellow at Stanford University, working at the intersection of human computer interaction and affective science. She is a member of the Stanford HCI group as well as the Stanford Psychophysiology Lab (SPL), directed by Professor James Gross, whose research underlies much of what we now know about emotion regulation. At SPL, Dr. Miri leads a multidisciplinary research team (WEHAB team) aimed at the design, engineering, and evaluation of technologies to help people to successfully manage their emotions, moods, and stress responses. She is interested in both neurotypical and neurodiverse populations. Specifically, her work focuses on using theoretically-grounded and data-driven approaches to end-to-end engineer systems that empower people to regulate their unwanted affective experiences and behaviors in their everyday lives. Then, by running carefully-designed clinical experiments, she examines both the average effect (whether the system was effective in changing affect) and the heterogeneous effect (for whom the system was effective). The results of this research will inform practice about what types of interventions are more useful for what type of trait and state individual differences, and will reduce the use of drugs in personalized mental healthcare.

Dr. Miri's research is supported by funding both from the National Science Foundation and from the Stanford Wearable Electronics (eWear) Initiative (the project for which she is the lead Principal Investigator).

## Education

- 2019 – Present **Stanford University**, Stanford, CA  
Postdoctoral, Psychology and Computer Science  
Supervisors: Profs. James Gross and Keith Marzullo.
- 2013 – 2019 **University of California–Santa Cruz**, Santa Cruz, CA  
Ph.D., Computer Science (Human Computer Interaction)  
Dissertation: *Using Technology to Regulate Affect: A Multidisciplinary Perspective* - funded by Intel Labs and NSF (Award No.CNS-1813982)  
Committee: Profs. Katherine Isbister (Advisor), James Gross (Co-advisor), Keith Marzullo (Co-advisor), Jim Whitehead (Chair), Luca de Alfaro, and Douglas Bonnet.
- 2007 – 2010 **University of California–San Diego**, San Diego, CA  
M.S., Computer Science (Computer Networks)  
Dissertation: *Miswirings Diagnosis, Detection and Recovery in Data Centers*  
Committee: Profs. Amin Vahdat (Advisor), Keith Marzullo (Co-advisor), and Joe Pasquale (See publication C.2).
- 2003 – 2007 **Amirkabir University of Technology**, Tehran, Iran  
B.S., Computer Engineering  
Dissertation: *Asynchronous Implementation, Synthesis and Power Analysis of AES Encryption Algorithm with a Secure Asynchronous Toolset* (See publication C.1).

## Internships

- 6/16 – 12/16 **Intel Labs**, Hillsboro, Oregon  
HCI Researcher Intern  
Built a high fidelity biofeedback haptic wearable device with 4 LRAs actuators, 4 drv-2605 drivers, an Arduino Uno, and a SMiRF serial port that is controlled by matlab commands. Matlab collects and adjusts haptic sensations based on real-time physiology measures collected via bluetooth. Haptic sensations are build via PWM signal manipulations.  
Developed an experimental design to understand user-perception toward haptic patterns via psychtoolbox (See publication C.4).
- 6/13 – 9/13 **NASA Ames Research Center**, Sunnyvale, CA  
User Experience Researcher Intern  
Developed a web-based interface for pilots for the purpose of flight instruction testing. And, launched and analyzed a user experience research study for a new interface design for manual commanding of spacecraft systems (See publication C.3).
- 8/10 – 9/11 **Microsoft Corporation**, Redmond, WA  
Program Manager, Windows Core Networking Group  
Designed a WMI object model for a multi-tenant datacenter networking feature (See Patent P.1).
- 1/08 – 3/08 **Qualcomm Inc.**, San Diego, CA  
Software Customer Engineer Intern.

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## Major Projects

### **Stanford University – Stanford**, Stanford, CA

Design, engineering and evaluation of an End-to-End inconspicuous vibrotactile system with an iOS app and ability to upload data to a web server for affect regulation in children diagnosed with autism spectrum disorder. Please visit <https://wehab.stanford.edu/research> for a list of the different prototypes of this device and how they have been evaluated.

### **University of California–Santa Cruz**, Santa Cruz, CA

Investigation of the placement, pattern, and personalization of a vibrotactile devices for affect regulation.

### **University of California–San Diego**, San Diego, CA

Design and implementation of a fault diagnostic tool for identifying and repairing miswirings in data center network architectures.

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## Teaching Experience

### Spring 2016 **University of California–Santa Cruz**, Santa Cruz, CA

Instructor for 60-hour University course: “Introduction to Computer Science and Programming”, special edition program inspired by MIT Introduction to Probability thought by Dr. John Tsitsiklis, UC, San Diego Algorithms thought by Sanjoy Dasgupta, and UC, Berkeley Snap programming tool I focused on teaching probability, recursion, as well as sorting algorithms and run times using a visual programming tool.

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## Publications

J = Journal, C = Conference (10 pages double column double-blind peer-reviewed), W = Workshop and extended abstracts, P = Patent

- 2020 [C.6] **Miri, P.**, Marzullo K., Uusberg, A., Ball M. T., Jusuf, E., Yamins K. D., Flory R., Gross J. J. “VibroAffect: The Underlying Affect Regulation Mechanism of a Vibrotactile Breathing Pacer”, in *ACM Transactions on Computer-Human Interaction (CHI) 2021*
- 2020 [P.2] **Miri, P.**, Flory, R., Marzullo, K., and Gross, J., Stanford University, 2020. Personalizable, Inconspicuous Vibrotactile Breathing Pacer. Patent date Filed Dec 1, 2019 by The Board of Trustees of the Leland Stanford Junior University, Stanford, CA Power of Attorney: Isaac Fine-74274
- 2020 [C.5] **Miri, P.**, Jusuf, E., Uusberg, A., Margarit, H., Isbister K., Marzullo K., Gross J. J. “PIV++: Evaluating a Personalizable, Inconspicuous Vibrotactile (PIV) Breathing Pacer for In-the-Moment Affect Regulation”, in *ACM Transactions on Computer-Human Interaction (CHI) 2020*. **Best Paper Honorable Mention Award (Top 5%)**
- 2019 [J.1] **Miri, P.**, Flory, R., Uusberg, A., Culbertson, H., Harvey, R., Keman, A., Peper, E., Gross, J. J., Marzullo, M. “PIV: Placement, pattern, and personalization of an inconspicuous vibrotactile breathing pacer.”, in *ACM Transactions on Computer-Human Interaction (TOCHI) 2019*
- 2019 [W.2] **Miri, P.**, Jusuf, E., Gross J. J., Isbister K., Marzullo K. (in press). "Affect regulation using technology: Lessons learned by taking a multidisciplinary perspective.", in *8th International Conference on Affective Computing and Intelligent Interaction (ACII) 2019*
- 2018 [W.1] **Miri, P.**, Uusberg, A., Culbertson, H., Flory, R., Uusberg, H., Gross J. J., Marzullo K., Isbister K. "Emotion Regulation in the Wild: Introducing WEHAB System Architecture.", in *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems (ACM) 2018*
- 2017 [C.4] **Miri, P.**, Flory, R., Uusberg, A., Uusberg, H., Gross, J., and Isbister, K., “HapLand: A Scalable Robust Emotion Regulation Haptic System Testbed”, in *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems, Denver CO, USA, May 2017*
- 2014 [C.3] Billman, D., Schreckenghost, D., and **Miri, P.**, “Assessment of Alternative Interfaces for Manual Commanding of Spacecraft Systems Compatibility with Flexible Allocation Policies”, in *Proceedings of the Human Factors and Ergonomics*, October 2014
- 2014 [P.1] **Miri, P.**, Garg, P., Schultz, B., Singhal, S.K. and Sivakumar, M., Microsoft Corp, 2014. Cross-machine event log correlation. U.S. Patent 8,806,005 (patent number 20130067067)
- 2009 [C.2] Radhika Niranjana Mysore, Andreas Pamboris, Nathan Farrington, Nelson Huang, **Pardis Miri**, Sivasankar Radhakrishnan, Vikram Subramanya, and Amin Vahdat, “PortLand: A Scalable Fault-Tolerant Layer 2 Data Center Network Fabric,” in *Proceedings of the ACM SIGCOMM Conference*, August 2009
- 2008 [C.1] **Miri, P.**, Ghavami, B., Najibi, M. and Pedram, H., "Exploring an AES Crypto-processor Design Using a Secure Asynchronous Toolset." in *Design Automation Conference (IEEE Cat 2008)*

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## Awards and Honors

- 2020 CHI Honourable Mention Award recipient (top 5% of submissions)
- 2020-21 Stanford Electronic Wearable (eWear) Seed Grant Award

- 2018-19 NSF PhD student grant recipient
- 2017 Intel Labs PhD student grant recipient
- 2015, 17, 19 Women in Computing Research (CRA-W) scholarship recipient
- 2015 NSF Graduate Data Science Challenges scholarship recipient
- 2009, 13 WIC Grace Hopper scholarship recipient
- 2013 WIC Grace Hopper PhD Forum Presenter award
- 2003 Top **0.02%** in nationwide entrance exam of Iranian Universities among 1.3M participants

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## Grant and Proposal Writing

### Stanford University (as a postdoctoral fellow)

- 2019 [G.4] **Stanford Predictives and Diagnostics Accelerator Grant.**  
*Facilitating Affect Regulation in Labile Hypertension.*  
Role: Lead author of the proposal. PIs: Profs. James Gross (psychology) and Katharine Sears Edwards (cardiovascular medicine). \$50,000. 2020-2021.
- 2019 [G.3] **Stanford eWear Seed Grant. Awarded.**  
*Facilitating Affect Regulation in Youth with Autism Spectrum Disorder.*  
Role: PI and Lead author of the proposal. PI supervisors: Profs. James Gross (psychology) and Antonio Hardan (School of Medicine). \$40,000. 2020-2021.
- 2019 [G.2] **Stanford Jaswa Innovator Award.**  
*Vibrotactile System For Affect Regulation in Children with Autism Spectrum Disorder.*  
Role: Lead author of the proposal. PIs: Profs. James Gross (psychology) and Antonio Hardan (psychiatry). \$200,000. 2019-2021.

### Stanford University (as a PhD student visiting scholar)

- 2017 [G.1] **EAGER National Science Foundation Grant. Awarded.**  
*Systems for Assisting in Emotion Regulation in the Wild.*  
Role: Lead author of the proposal. PIs: Profs. James Gross (Stanford University), Keith Marzullo (University of Maryland), and Katherine Isbisiter (University of California, Santa Cruz). \$270,000. 2018-2020. Award No.1813982

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## Software Artifacts

### **Embedded Systems,**

Firmware programming of nRF52 semiconductors (microprocessors equipped with Bluetooth low energy. Advanced Bluetooth Low Energy Communication when central and peripheral roles changes dynamically.

### **Signal Processing,**

Extracting breathing rate from blood volume pulse signal.

Inferring psychological arousal from skin conductance data using model-based approaches in LedaLab.

Inferring breathing rate and breathing irregularity from respiration data using variety of methods including Empirical Mode Decomposition, Fast Fourier Transform, Independent Component Analysis, and Exponential Smoothing.

### **App Development Management,**

iOS Swift language programming to build a personalization app and send/receive communication with a BLE enabled semiconductors. I managed my interns who took the role of developers..

### **Machine Learning (Stanford CS 229),**

Use of linear regression, logistic regression, XGBoost regression models and Shapley Values to identify for whom and in what context an intervention is effective (i.e., heterogeneous effect).

Stressor balancing using clustering algorithms .

### **Experimental Design (Stanford Psych251 and 252),**

Bootstrapped Mixed Design Modeling and Power Analysis in R

Bootstrapped Mediation Analysis in R

Wilcoxon signed rank test in R .

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## Invited Talks

- 5/4/20 Stanford Autism and Developmental Disorders Research Program

6/16/20 Stanford Psychophysiology Lab  
1/16/20 Stanford HCI Seminar  
1/9/20 Stanford Psychophysiology Lab  
1/9/20 Stanford Affective Science Seminar  
1/21/20 NASA Ames Brown Bag Seminar

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## Scholarly Service

### Conference Reviewing

2019 CHI  
2018, 19 UIST

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## Mentoring Experience

09/21 - 12/20 **Supervised Computer Science Undergraduate Research (CS 195)**, Stanford University  
Mentoring Stephanie Mehul Arora, and Aman Malhota..

06/20 - 09/20 **Computer Science Undergraduate Internships (CURIS program)**, Stanford University  
Mentoring Stephanie Hu, Mehul Arora, and Aman Malhota.

2017 – present **WEHAB Lab**, Stanford University  
Undergraduate, masters, and PhD students: Talia Regenstein, Elaheh Salehi, Eman Magzoub, Satvir Basran, Anna Speder, Sae Du, Eli Rice, Yi-Hsuan Wu, Akanksha Shrivastava, Joshua Chon, Candace Hagey, Agata Kelman, Aidan Levin, Aditi Gupta, Emily Jusuf, Jacqueline Nguyen, Alyssa Jackson, Stephanie Hu, Mehul Arora, Aman Malhota, Ishan Goya.

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## Press

10/21/2019 **Stanford Daily News**,  
Researchers work on device to help individuals with autism handle stress.