BIOGRAPHICAL SKETCH

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NAME: Pablo E. Paredes, PHD, MBA

POSITION TITLE: Instructor, Radiology Department, and Psychiatry & Behavioral Sciences Department, School of Medicine, Stanford University

eRA COMMONS USER NAME (credential, e.g., agency login): PABLO

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Universidad Politécnica Salesiana, Cuenca, Ecuador	Engineer	1999	Electronics
Georgia Institute of Technology, Atlanta, GA	MS	2003	Computer Engineering
Georgia Institute of Technology, Atlanta, GA	MBA	2004	Business
University of California - Berkeley, Berkeley, CA	PhD	2015	Computer Science – Human Computer Interaction
Stanford University, Stanford, CA	Postdoc	2018	Computer Science – Human Computer Interaction

A. Personal Statement

Pablo Paredes earned his PhD in Computer Science from the University of California, Berkeley in 2015 with an emphasis on Human-Computer Interaction (HCI) and minors in Social Psychology and Artificial Intelligence (AI). He is part of the faculty, as an Instructor, in the Radiology and Psychiatry Departments in the School of Medicine at Stanford University. Prior to joining the School of Medicine, he was a Postdoctoral Researcher in Computer Science at Stanford University for two years. During his PhD career, he held internships on behavior change and affective computing in Microsoft Research and Google. Before 2010, he was a senior strategic manager with Intel in Sao Paulo, Brazil, a lead product manager with Telefonica in Quito, Ecuador and an Entrepreneur in his natal Cuenca, Ecuador. In these roles, he has had the opportunity to perform various human-centered experiments evaluating around N=500 participants in a variety of applied-psychology experiments. His research skills span across multiple disciplines such as HCI, AI, psychophysiology, affective computing and human-centered design. His current focus in on the design and development of passive sensing and subtle intervention biomedical systems for wellbeing. During his tenure he has evaluated around N=500 participants in a variety of exploratory, controlled and longitudinal applied-psychology experiments. He has closely evaluated researchers, designers, engineers, and business people in affective and ubiquitous computing (Ubicomp), product development, and telecommunications. He has advised postdoctoral, PhD, masters, and undergraduate students across multiple disciplines, such as bioengineering, neuroscience, computer science, symbolic systems, and mechanical engineering.

B. Positions and Honors

Positions and Employment

1997 – 2000	CEO & founder, CPTronics (Electronics and Telecom company), Cuenca, Ecuador
1999 – 2001	Engineering Researcher & Lecturer, Universidad Politécnica Salesiana, Cuenca, Ecuador
2004 – 2005	Product and Service Development, IT & Services, AVAYA, Basking Ridge, NJ
2006 – 2008	Lead Product Manager, Data and Internet of Things, Telefónica, Quito, Ecuador
2008 – 2010	Strategic Manager, Wireless Broadband, Intel, Sao Paulo, Brazil
2012	User Experience Researcher Intern, Security Behavior Change, Google, Mountain View, CA
2013	PhD Research Intern, Affective Computing Technology, Microsoft Research, Redmond, WA
2016 – 2018	Postdoctoral Researcher, Stanford Computer Science, Palo Alto, CA

2018 – Present Instructor, Stanford School of Medicine, Radiology & Psychiatry Departments, Palo Alto, CA

Other Experience and Professional Memberships

2015	Reviewer for the ACM Symposium on User Interface Software and Technology (UIST)
2016	Reviewer for the ACM Design of Interactive Systems (DIS)
2016	Reviewer for the ACM CHI Computing and Mental Health Workshop
2011, 2013-2016	Reviewer for the ACM CHI Work in Progress/Late Break
2016	Reviewer for the IEEE Transactions of Affective Computing Journal
2017	Reviewer for the ACII Tools and Algorithms for Mental Health and Wellbeing, Pain, and Distress Workshop
2017	Reviewer for the Journal of Positive Psychology
2017	Reviewer for the ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)
2013, 2016-2017	Reviewer for the ACM Conference on Human Factors and Computing Systems (CHI)
2017	Reviewer for the Journal of Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
2016–2017	Reviewer for the Journal of Medical Internet Research (JMIR)
2017	PC Member for the Affective Computing and Intelligent Interfaces (ACII) Conference
2017	Associate Chair member for the "Understanding People: Theory, Concepts, Methods" subcommittee for the ACM Conference on Human Factors in Computing Systems (CHI 2018)
2018	Associate Chair member for the "Health" subcommittee for the ACM Conference on Human Factors in Computing Systems (CHI 2019)

Member, Institute of Electrical and Electronics Engineers (IEEE)
Member, Association for Computing Machinery (ACM)
Member, Association for Behavioral and Cognitive Therapies (ABCT)

Member, Society of General Internal Medicine

Honors

2000	Universidad Politécnica Salesiana: Best Thesis Award
2001	Fulbright Scholarship
2003	MSc Minority Outstanding Student Awards, Georgia Institute of Technology
2004	MBA Minority Outstanding Student Awards, Georgia Institute of Technology
2010	Academic Excellence Award, UC Berkeley
2010	Best Project Award, HCI Fall 2010 class, UC Berkeley
2011	Qualcomm Innovation Fellowship Finalist (Stress Technology)
2015	Berkeley Institute Data Science fellowship winner
2017	CHI 2017 – Excellent Reviewer Badge
2017	Stanford Engineering Catalyst for Change second place
2018	Stanford Engineering Catalyst for Change first and second places (3/3 projects funded)

C. Contribution to Science

1. **The development and evaluation of passive (non-invasive) sensing of stress and psychophysiological biomarkers.** Repurposing signals already existing in everyday technology to measure stress. Sensing stress in the wild requires proper efficacy but also engagement and adoption. The latter can hardly be obtained if the use of the sensor depends on the discipline and care of the user. We propose the creation of the foundations for sensing stress without the need to deploy any new sensors, or wearables, or the embedding or very simple "invisible" sensors in everyday computing & technology devices. Complementary, we start by looking at an untapped terrain, which is the use of

movement and manipulation. We established a line of research that shows promise in the use of the somatic nervous system (body movement) as a signal for mental changes. With this technology, billions PC mice, computer trackpads, smartphones and even the steering wheel or a passive camera in a car can become ecologically-valid sensors for stress.

i. Paredes, P., Ordoñez, F., Ju, W., Landay, J., Fast And Furious – Detecting Stress with a Car Steering Wheel, ACM Conference on Human Factors in Computing Systems (CHI 2018), Montreal, Canada, 2018. https://doi.org/10.1145/3173574.3174239
Peer reviewed, Full Article. Average acceptance rate: 25.8%, (N=25)

ii. Sun, D., Paredes, P., Canny, J., MouStress - Detecting Stress with Mouse Motions. ACM Conference on Human Factors in Computing Systems (CHI 2014), Toronto, Canada, 2014. https://doi.org/10.1145/2556288.2557243
Peer reviewed, Full Article. Acceptance rate: 23%, (N=49)

iii. Hernandez, J., Paredes, P., Roseway, A., Czerwinski, M., Under Pressure: Sensing Stress of Computer Users. ACM Conference on Human Factors in Computing Systems (CHI 2014), Toronto, Canada, 2014. https://doi.org/10.1145/2556288.2557165
Peer reviewed, Full Article. Acceptance rate: 23%, (N=24)

2. **The development and evaluation of ecologically-valid subtle interventions for stress.** Mental health technology wearables and apps suffer from an adoption and adherence (engagement) problem. Even successful interventions lose power over time due to false expectations, forgetfulness or simply boredom. I have proposed the use of everyday devices or apps as subtle and short interventions for stress management. On one hand, we presented the first modification of a car seat to guide commuters to breath better or to move in mindful ways. For those walking, we modified urban lights to make them interactive, but to deliver illumination patterns that are soothing and energy efficient. On another hand, we created the first system where machine learning algorithms can recommend everyday popular apps as simple interventions. We establish with this a new line of research where popular devices and media can be repurposed to and use of non-obtrusive techniques and environmental devices, such as chairs, desks, lamps, displays, can be used as non-volitional or even subliminal interventions to regulate arousal. Finally we explore the challenges of multi-sensorial stimulation to verify the effects of coherence across stimuli in enhancing (or reducing) individual effects.

i. Balters, S., Murnane, E., Landay, J., Paredes, P., Breath Boost: Exploring Fast-paced Breathing Interventions to Enhance Driver Vigilance in the Car, *12th EAI International Conference on Pervasive Computing for Healthcare (PervasiveHealth)*, New York, USA, 2018. (in press)
Peer reviewed, Full Article. Average acceptance rate: 24%, (N=27)

ii. Paredes, P., Zhou, Y., Hamdan, N., Balters, S., Murnane, E., Ju, W., and Landay, J., Just Breath - Just Breathe: In-Car Interventions for Guided Slow Breathing, *Journal of Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*. 2018. https://doi.org/10.1145/3173574.3174239, *(N=24)*

iii. Paredes, P., Hamdan, N., Cai, C., Clark, D., Ju, W., and Landay, J., Evaluating In-Car Movements in the Design of Mindful Commute Interventions, *Journal of Medical Internet Research (JMIR)*. 2017. http://dx.doi.org/10.2196/jmir.6983, *(N=12)*

iv. Paredes, P., Gilad-Bachrach, R., Roseway, A., Rowan, K., Czerwinski, M., PopTherapy: Coping with Stress through Pop Culture. 8th EAI International Conference on Pervasive , Computing for Healthcare (PervasiveHealth 2014), Oldenburg, Germany, 2014. https://doi.org/10.4108/icst.pervasivehealth.2014.255070
Peer reviewed, Full Article. Acceptance rate: 30%, (N=95)

v. Paredes, P., Ko, R., Calle, E., Canny, J., Hartmann, B., Niemeyer, G., Fiat Lux: Efficient Wellbeing Interactive Urban Lights, ACM Conference on Design of Interactive Systems (DIS 2016), Brisbane, Australia, 2016. https://doi.org/10.1145/2901790.2901832
Peer reviewed, Full Article. Acceptance rate: 26%, (N=94)

vi. Paredes, P., Ko, R.., Babler, L., Aghaseyedjavadi, A., Chuang, J., Canny, J., Synestouch: Haptic + Audio Affective Design for Wearable Devices, 6th International Conference on Affective Computing and Intelligent Interfaces (ACII 2015), Xi'an, China, 2015. https://doi.org/10.1109/ACII.2015.7344630

Peer reviewed, Full Article. Acceptance rate: 28%, (N=40)

vii. Paredes, P., Balters, S., Qian, K., Ordoñez, F., Ju, W., and Landay, J., Driving with the Fishes: *Mindful Virtual Reality for Commuters. Journal of Medical Internet Research (JMIR), 2018. (phase two: major revision)*
Peer reviewed, Full Article. Average acceptance rate: 26%, (N=27)

3. **Design of tools for early insight mining for qualitative exploration of social media.** Given the difficulty to interview large amounts of participants in qualitative studies, we combine human expertise with AI to deliver semantic analysis of large-scale text social media databases. We created the first system that helps mine early (non-obvious) insights in difficult topics such as behavior change, stress management, health, etc.

   i. Paredes, P., Rufino Ferreira, A., Schillaci, C., Yoo, G., Karashchuk, P., Xing, D., Cheshire, C., Canny, J., Inquire: Large-Scale Early Insight Discovery for Qualitative Research. ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW 2017), Portland, Oregon, 2017. https://doi.org/10.1145/2998181.2998363
   Peer reviewed, Full Article. Acceptance rate: 34%., (N=9)

Complete List of Published Work in PubMed: *NA*

D. Research Support

Ongoing Research Support

Catalyst for Change — Delp, Z. (PI) — 7/15/2018 – 7/15/2021
Stanford Engineering
Motivating Mobility and Health
The goal of this study is to investigate novel motivational technologies to increase mobility across different populations. We plan to generate novel narrative-based interventions to support mindset change and long-term behavior change. Paredes' lab will focus on a new concept around non-volitional interventions based on creating a "living chair" that forces people to either take breaks via small ergonomic modifications, or to alter their breathing rate through haptic or proprioceptive stimulation.
Role: Co-Investigator

Catalyst for Change — Billing, S. & Landay, J. (PI) — 7/15/2018 – 7/15/2020
Stanford Engineering
Hybrid Spaces for Enhanced Wellbeing
The goal of this study is to develop the science and research platform to investigate the relationships between in-building wellbeing metrics, such as stress, presenteeism, creativity, performance, and inclusion with building design and construction metrics, such as air flow, temperature, natural light, and cultural markers. Paredes' lab will focus on the research around passive stress sensing and environmental multi-sensorial interventions such as light and sound.
Role: Co-Investigator

Catalyst for Change — Bao, Z. (PI) — 7/15/2018 – 7/15/2020
Stanford Engineering
Effective, Scalable, and Affordable Strategies for Mental Health
The goal of this study is to investigate the creation of a skin-like wearable device that can monitor levels of Cortisol and other biometrics on an ongoing basis. We plan to generate evidence of correlations between physiological biomarkers and one or two common brain biotypes associated with depression. We hope to generate a sensor that can effectively measure data over long periods of time to shed light on the science of precise mental health states. Paredes' lab will focus on the development of preliminary understanding around the design and wearability of mental-health sensors in ecologically valid scenarios ("in the wild").
Role: Co-Investigator (Senior Member)

Medical School Seed Fund — Trockel, M. (PI) — 12/01/2017-12/01/2018
Stanford Medical School: Health for Healers

With this small seed fund we plan to explore technology-based alternatives to reduce burnout in doctors. We plan to explore winding down techniques during the commute to improve sleep. Initial focuse will be placed on relaxation and self-compassion techniques. The results of this project will be to propose and implement a proof-of-concept alternative and generate initial empirical data on the benefits and adoption of this new technology
Role: Postdoctoral Researcher

Renault Gift Landay, J. (Co-PI) 3/01/2017-03/01/2018
Stanford Computer Science Department
Micro Therapeutic Chatbots for Stress Management
The goal is to develop a platform for the creation of micro chatbots that deliver specific techniques for stress management. This is a paradigm shift moving from the creation of a single complex and many times non-implementable chatbot, to a series of very specific chatbots. First, we plan to leverage prior knowledge on stress management and convert it to a rule-based chatbot. As we get more data, we will then focus on
Role: Postdoctoral Researcher / Co-PI

Completed Research Support

Catalyst for Change Bao (PI) 7/15/2017 – 7/15/2018
Stanford Engineering
Effective, Scalable, and Affordable Strategies for Mental Health
The goal of this study is to investigate the creation of a skin-like wearable device that can monitor levels of Cortisol and other biometrics on an ongoing basis. We plan to generate evidence of correlations between physiological biomarkers and newly developed brain biotypes. We hope to generate a sensor that can effectively measure data over long periods of time to shed light on the science of precise mental health states.
Role: Postdoctoral Researcher

Toyota Gift Landay (Co-PI) 3/01/2017-3/01/2018
Stanford Computer Science Department
The Mindful Commute
The goal is to explore new technology and algorithms to transform the commute from a bug into a feature to use it to deliver daily wellbeing interventions. We have tested breathing interventions, movement interventions and currently we are developing conversational agents for commuters.
Role: Postdoctoral Researcher

Microsoft Gift Landay (Co-PI) 3/01/2016-3/01/2017
Stanford Computer Science Department
Wellbeing Technology Interventions
The goal is to develop a platform to administer and author novel interventions. We propose the use of machine learning online algorithms to optimize the adoption of interventions, as well as the use of the crowd as a source of new interventions.
Role: Postdoctoral Researcher

National Endowment for the Arts Niemeyer (Co-PI) 2/01/2016-2/01/2017
Berkely Institute of New Media
Urban Interactive Lights
The goal is to create a device to deliver engaging and soothing illumination patterns for urban lights. We established some preliminary research where we show the affective and energetic advantages of this technology and created several prototypes to illuminate the sidewalks in effective and engaging ways.
Role: Co-PI