Jessica de Souza

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I am a second-year Ph.D. student in Electrical and Computer Engineering at the University of California San Diego, in which I am part of the Digital Health Technologies Laboratory advised by Professor Edward Wang. At UCSD, my research focuses on solving problems in healthcare and enabling affordable and convenient personal health monitoring for patients with specific needs. In one of my projects, I explored the usage of PPG and force sensing to measure blood pressure, and also apply the same principle using smartphones in adults that need an easy self-assessment of their heart conditions. Currently, I am working with visual learning, sound analysis and processing to assess breastfeeding sounds, to help lactation consultants to improve their learning experience in the virtual world and better guide mothers who are breastfeeding. My research interests involve ubiquitous computing, human-computer interaction for healthcare and how we can build accessible devices for people in need, especially for chronic illnesses. I am also interested in novel methods to get reliable biological data, either by using sensors, smartphones, or other devices. My technical background includes HCI and cognitive science, ubiquitous computing, sensing techniques, hardware development, embedded systems, data analysis, and signal processing.

Employment History

Research

- **UC San Diego** — **Dr. Edward J. Wang**
  Graduate Student Researcher, Ubiquitous Data & Computing Lab — *Since January 2020*
  At the UDComp Lab, I am exploring new sensing techniques for biological signal acquisition using sensors, hardware development and programming in embedded systems. Some sensors I've worked with are: heart rate (PPG), pressure, thermal imaging, temperature probing, EMG. I am also exploring data science and speech processing of newborn sounds to assess breastfeeding quality for mothers and lactation consultants.

- **Microsoft Research, Redmond** — **Dr. Sidhant Gupta and Dr. Jonathan Lester**
  Undergraduate Intern, Clinical Sensing and Analytics Group — *May 2018 - August 2018*
  At MSR I created a novel wearable pulse sensing interface to improve cardiovascular health monitoring, with a non-invasive signal enhancement technique. I evaluated and compared it to existing wearable interfaces in a controlled study.

- **Federal Institute of Santa Catarina, Brazil**
  Research & Extension

  1. **Dr. Elen M. Lobato and Ramon M. Martins**
     Research student — *June 2017 - December 2017*
     I analyzed heart activities from a dataset involving myocardial infarction, arrhythmias, and healthy subjects, to predict abnormalities in cardiovascular exams.
  2. **Dr. Jorge H. Busatto Casagrande**
     Research student — *June 2016 - December 2016*
     Developed a novel sensor for electrical and hydraulic monitoring in residential electric showers to reduce water and energy consumption.
  3. **Dr. Pedro Armando da Silva Junior**
     Extension student — *February 2016 - June 2016*
     Taught middle and high school students the concepts of embedded systems and basic robotics. Worked towards increasing the number of students in the STEM field.

- **University of Nevada, Reno** — **Dr. Yantao Shen**
  Research student, Bioinstrumentation and Automation Lab — *June 2014 - July 2015*
  At UNR I worked on the "E-Braille" project, collecting bioimpedance from the fingertip to find correlations between finger applied force and the bioimpedance, for an electrical stimulation closed-loop system.

Industry

- **AQTech Power Prognostics, R&D Team**
  Software Development Analyst — *July 2019 – November 2019*
  I worked with Analog Devices' WirelessHART technologies for a wireless sensor network for an energy power plant. Implemented protocols and coded in firmware and intermediate level (C/C++) for specific applications. I also started and managed the testing table process for large-scale device manufacturing.

- **IMEX Medical Group**
  Equipment Maintenance and Installation Intern — *March 2019 – July 2019*
  At IMEX I've provided corrective and preventive maintenance in digital X-rays, ultrasounds, mammography, and CT. I also did remote access to install and correct bugs in x-ray systems, exam visualization software, and hospital database. I have gained experience with the following brands for hardware and software: Terarecon, IRAY, Barco, Hologic Dimensions, Alpinion Medical Systems.

Education History

- **Ph.D., Electrical and Computer Engineering** — **Jan. 2020 - Present**
  University of California San Diego (UCSD), USA — *Current GPA: 3.587*
- **B.E., Telecommunications Engineering** — **2013 - 2019**
  Federal Institute of Santa Catarina (IFSC), Brazil
- **Exchange Student, Electrical and Computer Engineering** — **2014 - 2015**
  University of Nevada, Reno, USA
- **Intensive English Language Center, High Advanced** — **2014**
  University of Nevada, Reno, USA

Honors, Awards, and Grants

- **2017** Second place at the IFSC Innovative Ideas Contest, Brazil. 10,000.00 BRL grant.
- **2017** Best extended abstract at the VIII Computer on the Beach. UNIVALI, Brazil.
- **2015** Outstanding First-Year Student In Chinese. University of Nevada, Reno, USA.
- **2014** Scholarship Holder of CAPES (Improvement Coordination of Higher Education Personnel), in the Brazil Scientific Mobility Program (BSMP).

Technical and Personal skills

- **Programming Languages:** Familiar with: Python, C, C++, Matlab, Java, Android, PowerShell, HTML, CSS.
- **Industry Skills:** Prototyping and testing devices, analog and digital circuits, data analysis, sensing techniques, signal processing, wireless communication & RF, computer networks, embedded systems (hardware & firmware), human-computer interaction, medical imaging equipment, application interface design.
- **Languages:** Brazilian Portuguese (native), English (fluent).
- **Softwares:** MATLAB, Multisim, Eagle, Visual Studio, Pspice, Quartus ModelSim, GIT, Linux, Proteus Circuit, AutoCAD.
- **Relevant Courses:** Programming for data analysis, cognitive science foundations, foundations for future user interfaces, human-centered computation for health, embedded system design project, human-centered programming, principles of biomedical imaging, medical devices and interfaces.

Academic Services

- Teaching Assistant at UCSD. Introduction to Analog Design (ECE 35). Fall 2021.
- Reviewer for Ubicomp/ISWC 2020 - 2021. Papers, posters and demos.
- UDComp Lab Spring break research experience. Eagle tutorial for undergraduates. UC San Diego. 2021.
- Volunteer at ACM international joint conference on pervasive and ubiquitous computing (UBICOMP). Online. 2020.
- Presented several inspirational talks at my undergraduate university about: engineering careers, opportunities during college, exchange programs, why is it important to learn a new language, experiences as a woman in STEM. Between 2015 and 2018.
- Attended the Annual Ideagen UN Empowering Women Girls 2030 Summit. United Nations NY. 2018.
- Organizing committee, IEEE Latin American Symposium on Circuits and Systems. Florianopolis, Brazil. 2016.

References

- Edward Wang, Ph.D., UC San Diego.
- Sidhant Gupta, Ph.D., Microsoft Research.
- Samuel Heiderscheidt, Imex Medical Group.
- Roberto Wanderley da Nóbrega, Ph.D., Federal Institute of Santa Catarina.