Ana Paola Garcia Alonzo

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Education

Tecnologico de Monterrey *(ITESM)* **Expected June 2024**
Bachelor of Science in Biomedical Engineering | GPA: 3.933 Guadalajara, Mexico

Relevant coursework

Analysis and Design in Biomechanics | *Computational Thinking for Engineering* | *Matrix Modeling* | *Statistical Analysis* | *Modeling and Control of Biomedical Systems* | *Design in Neuroengineering*

Skills

Programming Languages: Python, MATLAB, C, HTML/CSS
Microcontrollers: Arduino, Raspberry Pi
Software: SolidWorks, Eagle, Nexus Motion Capture
Languages: Spanish (Native), English (C1), German (B1)

Publications, Posters, and Presentations

[1] "Exploring the Feasibility of Using IMU Data From Diverse Activities to Detect Biomechanical Parameters" | Ramin Fathian, **Ana Paola Garcia Alonzo**, Aminreza Khandan, Milad Nazarahari, Hossein Rouhani | *24th Annual Alberta Biomedical Engineering Conference; Poster presentation* | Poster

[2] "SPEERLoom: An Open-Source Loom Kit for Interdisciplinary Engagement in Math, Engineering, and Textiles" | Samantha Speer, **Ana P Garcia-Alonzo**, Joey Huang, Nickolina Yankova, Carolyn Rose, Kylie A Peppler, James McCann, Melisa Orta Martinez | *UIST; accepted* | Article

[3] "Hands-On Data: Developing Foundations of a Haptic Mouse for Graphic Interpretation " | **Ana P. Garcia-Alonzo**, Songwei Fan, Melisa Orta Martinez | *2023 RISS Working Papers Journals* | Poster

[4] "A Tensioning Mechanism for An Open Source Educational Jacquard Loom" | **Ana P. Garcia-Alonzo**, Samantha Speer, James McCann and Melisa Orta Martinez | *2022 RISS Working Papers Journals* | Journal | Video | Poster

Research Experience

Mitacs Globalink Research Internship **July – October 2023**
University of Alberta | *Dr. Hossein Rouhani* | *NCB Lab* *Edmonton, AB, Canada*

- Preprocessed 12 million datapoints from 5 varied datasets with Matlab and Python to pre-train a self-supervised learning model for biomechanical event estimation.
- Modified and pre-trained an self-supervised learning model for biomechanical task classification from Inertial Measurement Unit (IMU) data.

Robotics Institute Summer Scholar Program (RISS) **June – August 2023**
Carnegie Mellon University | *Dr. Melisa Orta Martinez* | *SHRED Lab* *Pittsburgh, PA, USA*

- Developed an Arduino library to control an inverse delta mechanism through interaction with the computer mouse.
- Designed the foundations to build a haptic mouse with an inversa delta mechanism and controlled through Arduino.

Robotics Institute Summer Scholar Program (RISS) **June – August 2022**
Carnegie Mellon University | *Dr. Melisa Orta Martinez* | *SHRED Lab* *Pittsburgh, PA, USA*

- Utilized SolidWorks to design tensioning mechanism of a Robotic Loom intended to be use for educational purposes at an undergraduate level.
- Presented and published conducted research on tensioning mechanisms within an educational context as a scientific poster and paper in the Working Papers RISS Journal 2022, Volume 10.

Projects

Mynd Music: From Brainwaves to Music | *Awarded national funding* **April 2022**

- Co-authored award winning proposal for the development of artistic exhibition which merges biomedical engineering by creating music with ECG waves, emotion recognition and sensory stimulation.
- Designed a Python-based GUI for the Raspberry Pi to control the biological sensors connected via Bluetooth, and start the smell-enhanced VR experience.
- Integrated biomedical sensors of EEG, and heart rate with Python into a Raspberry Pi for data acquisition and processing.

Biomedical Device Development | *Course projects* **Spring & Fall 2022**

Experimental Biomechanical Footwear

- Analyzed the gait of both a healthy and injured simulated patient with Motion Capture software.
- Calculated the biomechanical forces during gait to design an orthotic shoe suitable for chronic ankle instability.

Digital Electrogoniometer for Wrist Injury Therapy

- Programmed a Freedom KL25Z microcontroller to display the angles on a mobile app to aid wrist injury therapy.
- Used SolidWorks to design an ergonomical portable electrogoniometer to fit a patient's wrist.

Wearable EMG for Ankle Injury Therapy

- Instrumented and calculated the pipeline of analog filters and amplifiers of a wearable EMG to track ankle injury rehabilitation.

Design of EEG Learning Method Classifier Experiment | *Course project* **Spring 2023**

- Designed an experiment to determine visual and non-visual learning methods for undergraduate students using a game-based evaluation and EEG classification of delta waves.
- Constructed the algorithm to obtain the Power Spectral Density of the episodes witih the task to find statistical significance.
- Programmed the experiment using the Epoch X Headset and the Psychopy Software based on the Cognify test.

Leadership

RoboLaunch: Come Explore Robotics! **Summer 2022 to present**

Scholar Leadership Team | Social Media Leader *Robotics Institute, CMU*

- Developed and maintained a strong social media presence for RoboLaunch events.
- Created multilingual outreach for scientific communication in robotics research field.

Biomedical Engineering Student Society **Fall 2022 – Spring 2023**

President *ITESM*

- Organized the attendance of 46 students to the National Conference of Biomedical Engineering in Puerto Vallarta.
- Led chapter of 8+ members to work towards activities that improve and promote academics, and unity between biomedical engineering students.
- Designed a website to provide useful information about the academic life such as: resources, work spaces, professors, and labor opportunities.

Awards and Scholarships

2023 Summer ***Mitacs Globalink Research Intern Award*** | Selected international scholar
2023 Summer ***Carnegie Mellon Summer Research Scholarship*** | 1 of 40 selected scholars
2022 Summer ***Carnegie Mellon Summer Research Scholarship*** | 1 of 40 selected scholars
2022 Spring ***Creative Fund of the Art*** | 1 of 4 research groups awarded nationally
2022 Fall ***ITESM Academic Merit Award*** | International & academic participation
2021 Spring ***ITESM Academic Merit Award*** | Top % 10 of class