

Sergio JÁCOBO ZAVALETA^{ID}

Mechatronics Engineer

[in linkedin.com/in/sjacobozavaleta](https://www.linkedin.com/in/sjacobozavaleta) github.com/sjacobozavaleta [G scholar.google.com](https://scholar.google.com) [G researchgate.net](https://researchgate.net)
☎ +617818424 ✉ 100514566@alumnos.uc3m.es

Motivated Robotics and Automation Master's student with hands-on experience in the design and control of soft robotic systems based on Shape Memory Alloys (SMA). Currently working on my final thesis project focused on developing novel actuation strategies for improved performance in tendon-based soft actuators. Passionate about contributing to real-world applications through interdisciplinary collaboration, evidence-based research, and innovation under resource constraints.

⚙️ RESEARCH EXPERIENCE

DESIGN AND CONTROL OF A LONG SHAPE MEMORY ALLOY (SMA) TENDON-BASED SOFT ACTUATOR FOR ROBOTICS APPLICATIONS

MARCH 2025 - ONGOING

Universidad Carlos III de Madrid, España

Robotics student researcher. Developing a novel tendon retraining configuration to enhance the load-lifting capacity and length recovery performance of thermally activated SMA actuators. The project focuses on optimizing activation protocols, mechanical design, and sensor-integrated control strategies to improve efficiency, responsiveness, and reliability in soft robotic systems.

RENACYT RESEARCHER

APRIL 2023 - ONGOING

[🔗 Verified profile](#)

Enabled and registered in the National Scientific Register (RENACYT) of Peru. Code: P0153371

TECHNOLOGICAL PROJECTS ABOUT PREVENTION AND ASSISTANT IN PATIENTS WITH COVID-19

MARCH 2019 - OCTOBER 2019

[🔗 News 1](#) [🔗 News 2](#) [🔗 News 3](#)

Universidad Nacional de Trujillo, Peru.

- Contributed to the restoration of mechanical ventilators at Hospital Regional Docente de Trujillo, collaborating with faculty, students, and graduates from the Escuela de Ingeniería Mecatrónica to make two ventilators fully functional, requiring only consumable replacement parts for continued use. This initiative extended to additional units with governmental support.
- Collaborated in the implementation of digital thermometers and automated cleaning system at low cost by applying reverse engineering to produce a new, compact module-base design. Due to commercial limitations for importing specific electronic parts, the unit sales prices were up to 150 % of the market prices.
- The initial prototype and testing of an Arduino-based design resulted in the enhancement of microcontroller-based control for devices that require long battery life up to 8 hours of continuous use.

🎓 FORMATION

September 2024 Ongoing	Master in Robotics and Automation, UNIVERSIDAD CARLOS III DE MADRID, Madrid, España <ul style="list-style-type: none">➤ Specialized in advanced robotics and automation systems.
---------------------------	--

June 2022	Professional title in Mechatronics Engineer, UNIVERSIDAD NACIONAL DE TRUJILLO, Trujillo, Perú <ul style="list-style-type: none">➤ Developed expertise in mechatronic system design and implementation.
-----------	--

April 2014 December 2018	Bachelor of Science in Mechatronics Engineering, UNIVERSIDAD NACIONAL DE TRUJILLO, Trujillo, Perú <ul style="list-style-type: none">➤ TFG: 🔗 Modelamiento y simulación de un robot clínico asistido por Ultrasonido 3D para mejorar el guiado de inserción de agujas en biopsia percutánea de mama➤ Third-class rank.
-----------------------------	--

👛 PROFESSIONAL EXPERIENCE

April 2021 November 2020	Maintenance Assistant of biomedical equipment, NORSAC SAC, Lima-Perú <ul style="list-style-type: none">➤ Programmed and adapted preventive maintenance plans of old and out of date equipments based on user's experience. <div>Medical equipments</div>
-----------------------------	--

November 2019
May 2019

Maintenance Assistant, NORSAC SAC, Trujillo-Perú

- Formulated and collected the effects of implementing new engineering-based features in their Integrated System of Management by reducing time of up to 50 % in communication between Maintenance and Logistic Areas.
- Provided an updated version of the plant's electrical power distribution system for facilitating manipulation, testing and equipments installation in less than a month.
- Reduced distribution time of maintenance assignments of up to 90 % within the staff by computationally automating the management of preventive maintenance plan.

Textile Industry

PROJETS

TOPOLOGICAL NAVIGATION FOR AUTONOMOUS MOBILE ROBOTS

2025

github.com/SJacoboZavaleta/topology_navigation

ROS Python Gazebo

AUTOMATED MEDICATION DISPENSING USING A ROBOTIC MANIPULATOR

2024

github.com/SJacoboZavaleta/drug_dispensing_RI

RobotStudio Python

AUTONOMOUS GROUND VEHICLE SIMULATION IN UNSTRUCTURED TERRAINS

2024

github.com/SJacoboZavaleta/agv_robot

Webots Python

AMERICAN SIGN LANGUAGE (ASL) HAND GESTURE RECOGNITION

2024

github.com/SJacoboZavaleta/hand_gesture_detection

Python Mediapipe OpenCV

OPTIMIZATION OF ROBOTIC ARM CONTROL PARAMETERS USING EVOLUTIONARY ALGORITHMS

2024

github.com/SJacoboZavaleta/optimized_control_robot

MATLAB Simulink

LANGUAGES & COMPETENCIES

Languages	Spanish (Mother tongue), English (TOEFL ITP B2), Japanese (JLPT N5), German (Basic)
Programming	Python, Matlab, R, C++
Typesetting System Software	Latex, Quarto, Markdown
3D Computer Assisted Design	Fusion 360, Solidworks, Onshape
Statistical Analysis Software	RStudio, Matlab, Jupyter Lab
Reference Manager Software	Zotero, Bibtex/Biblatex, Mendeley
Platforms	Windows, Linux, Arduino
Soft Skills	Leadership, event management, pitch presentations, time management

PUBLICATIONS

- Jácomo-Zavaleta, S., & Zavaleta, J. (2023a). Needle Placement for Robot-Assisted 3D-guided Ultrasound Breast Biopsy: A Preliminary Study. *IEEE Latin America Transactions*, 21(3). Link. <https://doi.org/10.1109/tla.2023.10068849>
- Jácomo-Zavaleta, S., & Zavaleta, J. (2023b). A Deep Learning Approach for Epilepsy Seizure Identification Using Electroencephalogram Signals: A Preliminary Study. *IEEE Latin America Transactions*, 21(3). Link. <https://doi.org/10.1109/TLA.2023.10068845>
- Zavaleta, A., Ñuflo-Vásquez, S., Alarcón-Turiani, V., & Jácomo-Zavaleta, S. (2023). Serie de Casos de Conducta Suicida Atendidos En Un Centro de Salud Del Norte Del Perú. *Norte Médico*, 1(5), 27-30. Link.
- Jácomo-Zavaleta, S., Zavaleta Gavidia, W., & Zavaleta Gavidia, V. (2022). Deep Learning y Enfermedades Oculares. *Norte Médico*, 3(2). Link.
- Zavaleta de Los Ríos, V., Jácomo-Zavaleta, S., & Zavaleta Gavidia, V. (2022). Microbiota Intestinal y Las Enfermedades Neurodegenerativas. *Norte Médico*, 1(2). Link.