Sergio Jácobo Zavaleta

Mechatronics Engineer | Robotics Researcher | Educator

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Currently pursuing a Master's in Robotics and Automation at Universidad Carlos III de Madrid.

I design intelligent clinical robots and biomedical devices that bridge engineering, AI, and medicine. My research focuses on soft robotics, medical imaging, and automation for healthcare — with publications in peer-reviewed journals.

When I'm not building or researching, I help students — especially Spanish speakers — master modern tools for academic success: $\LaTeX$, Quarto, Python, Zotero, and reproducible workflows.

Welcome to my digital notebook: *La Tercera Fundación.*

😵 What I Do

🤖 Robotics & Research

I'm currently working on my master's thesis at UC3M, developing **novel actuation strategies for tendon-based soft actuators using Shape Memory Alloys (SMA)**. My goal is to improve performance in load capacity and recovery for applications in minimally invasive surgery and assistive robotics.

Starting in September 2025, I'll continue my journey at Universidad Carlos III de Madrid as a Graduate Researcher in the robotics lab, working on the project SRAR: Soft Robotics for Ankle Rehabilitation (PID2023-149141OB-I00). This role builds directly on my master's research on soft actuators using Shape Memory Alloys (SMA), now evolving into the design of wearable robotic systems for medical rehabilitation. I'm excited to contribute to a project that bridges engineering and healthcare, turning research into tangible solutions for patients.

I've also worked on: - Robot-assisted ultrasound-guided breast biopsy systems. - Deep learning for medical signal analysis (EEG, ocular diseases). - Restoration of biomedical equipment under resource constraints.

📑 Educator & Open-Science Advocate

I believe knowledge should be open, clear, and accessible. That's why I write in **Spanish** — to support students who, like me once, struggled to find high-quality technical resources in our language.

Through this site, I share guides on: - Academic writing with $\LaTeX$ and **Quarto**. - Reproducible research with Python, R, and RMarkdown. - Reference management with Zotero and BibTeX.

This blog is my **personal library in progress** — a space to document, reflect, and share what I learn.

🎓 Education

Master in Robotics and Automation
Universidad Carlos III de Madrid, Spain
Sep 2024 – Ongoing

Bachelor of Science in Mechatronics Engineering
Universidad Nacional de Trujillo, Peru
Apr 2014 – Dec 2018
- Thesis: *Modeling and simulation of a 3D ultrasound-guided clinical robot for percutaneous breast biopsy*. Link.

🔬 Research & Projects

Researcher – SMA Soft Actuators

UC3M Robotics Lab, Madrid | Mar 2025 – Present

Designing next-gen soft actuators for medical robotics with improved efficiency and control.

National Researcher (RENACYT)

CONCYTEC, Peru | Apr 2023 – Present

Registered in the National Scientific Register (Code: P0153371).

Key Projects

- **Topological Navigation for Mobile Robots** (ROS, Python, Gazebo) — GitHub
- **Automated Medication Dispensing Robot** (RobotStudio) — GitHub
- **ASL Hand Gesture Recognition** (OpenCV, MediaPipe) — GitHub
- **Ventilator Restoration & Low-Cost Thermometers** for hospitals during the pandemic.

💼 Skills

Category	Tools & Competencies
Programming	Python, MATLAB, C++, R
Robotics	ROS, Gazebo, Webots, RobotStudio, Arduino
Writing & Publishing	$\LaTeX$, Quarto, RMarkdown, Markdown, Zotero
CAD & Simulation	Fusion 360, SolidWorks, Onshape
Languages	Spanish (native), English (B2), Japanese (N5), German (basic)
Soft Skills	Teaching, technical communication, leadership, event management

🎁 Download My Full CV

Prefer a formal, printable version? Go to *Other Formats* in the sidebar and click on Typst or download it from 📥 here

🧩 Beyond Academia

When I step away from the screen, I enjoy:

- Running ♂
- Reading sci-fi books and manga
- Watching films and series
- Playing video games 🎮

This site is inspired by *La Tercera Fundación* — a place where knowledge is preserved and shared for the future.

Welcome aboard.