Franco Castro Chaves

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Objective

I am Franco Castro, an electrical engineer with strong academic aspirations, driven by a deep passion for research, education, and creativity. I aim to contribute to global health and scientific understanding by developing technological solutions that are both efficient and accessible. Through interdisciplinary collaboration and hands-on innovation, I strive to turn complex challenges into opportunities for real-world impact.

Education

University of Costa Rica, Bachelor's degree in Electrical Engineering. Specialization in Electronics and Telecomunications. — Mar 2020 – Jun 2025

University of Costa Rica, Licentiate degree in Electrical Engineering. Specialization in Communication systems. — Jun 2024 – Dec 2025

- **Coursework:** Biomedical, Artificial intelligence, Internet of Things, Information technology, Pure mathematics
- **GPA:** 8.94/10.

Academic Assistant and Laboratories Experience

University Social Service Assistant, School of Electrical Engineering – University of Costa Rica, San José — Mar 2025 – Jun 2025
Led projects integrating technology into developing tropical societies to contribute to their comprehensive and sustainable development.

Communications Engineering Assistant, School of Electrical Engineering – University of Costa Rica, San José — Mar 2025 – Jun 2025
Assisted in the Communications Engineering course, including grading, student support, and final project implementation.

Metrology Engineer and Testing Designer, Costa Rican Metrology Laboratory – University of Costa Rica, San José — Feb 2024 – Nov 2024
Worked with ISO standards for equipment calibration, precise measurements, and ensured reliability and accuracy in testing procedures.

Prototyping Engineer, Electrizarte – University of Costa Rica, San José — Feb 2024 – Dec 2025
Developed prototypes combining art and technology for social impact projects.

Researcher and Assistant, Biomedical Engineering Research Laboratory – University of Costa Rica, San José — Jul 2022 – Dec 2025
Developed an algorithm optimizing economic resources and processing time for metastasis detection using biomedical photoacoustic imaging and contrast agents.

Languages

Spanish: Native.
English: Medium-Advanced (B2).
TOEIC, Costa Rican-North American Cultural Center. Intermediate B2 level (Dec 2019).
English Test, Duolingo. Upper Intermediate: CEFR B2+ (Dec 2024), Score: 120/160.

Soft Skills

I consider myself a person with excellent assertive communication skills, highly creative in problem-solving, extremely organized, and proficient in time management, all of which have been strengthened through resilience. I am always eager to learn and enjoy working in collaborative environments. I also know when to take on a leadership role or contribute as a team member, adapting to the needs of the group.

Technical Skills Acquired through Experience in Courses and Projects

Operating Systems: Windows, Linux (Ubuntu)

Programming: Python, C, Arduino, Processing, MIPS Assembly, Matlab, Verilog

Data Management: Excel, MySQL, Pandas, Matplotlib

Software: AutoCAD, SolidWorks, Simulink, Node-RED, ContikiOS, circuit simulation software (Tina, orCAD, PLECS, Gecko Circuits, etc.), Cisco Packet Tracer, Trello, FreeCAD, Power BI, PowerPoint

Hardware: ESP32, Raspberry Pi, Arduino

Document Writing: Word, LaTeX

Version Control: Git, GitHub

Networking: HTTP, MQTT, WebSocket

Biomedical skills: ISO norms (ISO 12311:2013, ISO 12312-2:2015, ISO 12311:2023, ISO 18526), biomedical imaging (ultrasound imaging, photoacoustic imaging, and development of synthetic tissues), math proofs.

Certificates

Medical Innovation Bootcamp, Rice University. Introduction to biomedical engineering prototyping. *Awarded "Most Innovative Prototype" for the development of a UV sterilization box for ultrasound transducers.*   May 2025

Need Finding Workshop, Rice University. Ethnography for problem solving focused on visiting real hospital environments.   Jun 2023

Medical Innovation Workshop, Rice University. Introduction to biomedical engineering prototyping.   Jun 2023

LaTeX Workshop, University of Costa Rica. Acquired advanced skills in document preparation for academic and professional purposes   Feb 2022

Projects

Line Follower Robot   Mar 2025 – Jun 2025
Led a team in building a robot that follows a line using a control system for social impact purposes. **Technologies:** Arduino Nano, 28BYJ-48 stepper motor, ULN2003 Darlington array, 60048 infrared sensor, FreeCAD, Excel, PID control.

Implementation of the 3R Rule in Rural Communities of Costa Rica   May 2024 – Mar 2025
Led a team in a project to recycle, reduce, and reuse solid waste such as cardboard, aluminum, plastic, and glass through low-cost implementations. **Technologies:** Excel, FreeCAD, 3D printers.

Testing and Standardization of Eclipse Observation Glasses in Costa Rica   Feb 2024 – Dec 2024
Conducted tests to establish a national standard for verifying the safety of eclipse observation glasses, ensuring compliance with ISO 12312-2:2015. **Technologies:** Cary 5000 UV-VIS-NIR spectrophotometer, Excel, solar filters.

Automated Speed Violator Detection System   Jun 2024 – Dec 2024
Led the development of an automated vehicle detection prototype that identifies vehicles exceeding speed limits using IoT.
Technologies: Pressure sensors, ESP32, MQTT, BLE, HTTPS, WebSocket, Python, MySQL.

Optimization of Metastasis Detection Using Photoacoustic Imaging   Jul 2022 – Present
Developed an algorithm to optimize economic resources and image acquisition time for metastasis detection using photoacoustic imaging and contrast agents.
Technologies: MATLAB, gold nanoparticles, gelatin-based phantoms.

Automated Security Box for Biomedical Imaging   Feb 2022 – Jun 2022
Designed and built a closed black box for ocular protection that automatically captures biomedical images of samples using a CNC device.
Technologies: AutoCAD, Excel, MATLAB, Python, CNC, ESP32, MQTT.