

# Jessé Alves

ELECTRICAL ENGINEERING · AUTOMATIC CONTROL EXPERT

13 Rue du Verger, Illkirch-Graffenstaden, France

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## Summary

Current Master's student in biomedical engineering, design and prototyping of parsimonious technologies for upper-limb muscle activation. With a background in electrical engineering, focusing on automatic control, this scholar is ready for innovation. Embracing challenges from advanced control to robotics and AI, and adept at learning new tech and languages as needed. I am seeking outstanding research programs and ground-breaking topics.

## Education

### Télécom Physique, Université de Strasbourg

Strasbourg, France

MASTER OF SCIENCE (M.Sc.) IN BIOMEDICAL ENGINEERING - HEALTHTECH PROGRAM

Sep. 2022 - Sep. 2024

- Master's thesis on the design and control of a cost-efficient exoskeleton for upper-limb rehabilitation.
- Specialization in projects involving modeling and simulation of dynamic systems, robotics for surgical applications, computer vision, pose estimation and registration, robotic control, and optimization.
- Training in areas involving biomechanical and physiological system modeling.
- Acquisition of medical images: MRI, ultrasound, X-ray, CT-scan, nuclear, and optics.
- Advanced medical imaging processing using AI for segmentation, classification, and prediction.
- Insights into medical sector economics, intellectual property, and creativity management.

### Universidade Federal da Bahia (UFBA)

Salvador-Bahia, Brazil

BACHELOR OF SCIENCE (B.Sc) IN ELECTRICAL ENGINEERING

Nov. 2016 - Jul. 2022

- Bachelor's thesis in Robust Trajectory Control of an Unmanned Aerial Vehicle.
- Training and experiences in projects involving design, implementation and prototyping of power systems, electronics systems, communication and automatic control systems.
- Specialization in automatic control applied to robotics, covering modeling and identifying dynamic systems, classical control techniques, optimal control, robust control, linear matrix inequality formulation, model predictive control, internal model control, and nonlinear control.
- Supplementary topics include active vibration control, introduction to path planning for mobile robotics, state feedback and estimation using Kalman Filter.

### Colégio Integrado Polivalente

Salvador-Bahia, Brazil

TECHNICAL COURSE OF ELECTROTECHNICS

Feb. 2022 - Jul. 2022

- Training in practical projects involving installation of residential power systems and operation of electronic systems.

## Research & Project Experience

### iCube Strasbourg & Politecnico di Milano.

Strasbourg, France & Milan, Italy

MECHATRONICS DESIGNER INTERN

Feb. 2024 - Aug. 2024

- Main master's research project.
- Propose an actuation solution based on the use of springs.
- Design CAD model.
- Assemble the mechanical system with a cost-efficiency measurement system.
- Develop a control strategy in ROS2 to assist the patient's voluntary movement.

### Robotics, Data Science and Healthcare Technologies (RDH) & Politecnico di Milano.

Strasbourg, France & Milan, Italy

ELECTRONIC DESIGNER INTERN

Feb. 2023 - Jul. 2023

- Design and prototype a cost-efficient bracelet to measure biceps muscle contraction.
- Designing a printed circuit board, using ESP32 microcontroller and Force-Sensing Resistor (FSR).
- Publishing pre-processed and mapped data to the ROS2 environment via USB and WiFi.
- Developing a graphical user interface for manipulating the prototype.

### Télécom Physique.

Illkirch-Graffenstaden, France

SOFTWARE DESIGNER

Feb. 2023 - May. 2023

- Design and simulation of a virtual environment and collision model for the Pantograph, a 2-dimensional force-feedback device.
- Developed within the ROS2 Humble environment.
- Focused on robotics and sensory perception, particularly with regard to tactile feedback.

### Robotics Laboratory (LAR) - UFBA

Salvador-Bahia, Brazil

CONTROL DESIGNER

Sep. 2020 - Jul. 2022

- Research and develop a Robust LQR Trajectory Control for the AR.Drone 2.0.
- Comparing stability and performance between LQR and LQR control with polytope uncertainty-type robustness.

## Iberdrola Neoenergia Coelba

DATA ANALYST AND PROCESS OPTIMIZER

- Research and innovation in a private company in data analysis and optimization aiming to increase productivity.
- Fraud detection using machine learning algorithms.
- Development of a virtual assistant to act via voice command and Telegram.

## Robotics Laboratory (LAR) - UFBA

ROBOTIC AND CONTROL DESIGNER

- Research and prototype a cost-efficient balancing robot that stands on two wheels.
- Using discrete PID implemented into Arduino board, IMU and Kalman Filter.

## Robotics Laboratory (LAR) - UFBA

ROBOTIC AND CONTROL DESIGNER

- Research and prototype the mobile pioneer robot.
- The robot follows a tag by using one webcam and Raspberry Pi to pose estimate it.

## Department of Chemical Engineering (DEQ) - UFBA

FLUID MECHANICS EXPERIMENT DESIGNER

- Modeling and prototyping of a water and compressed air rocket using a plastic bottle.
- Aiming to mathematically estimate the distance covered by an oblique launch based on the mass of water and air pressure.

## Electric Wave Group - UFBA

ELECTRONIC DESIGNER

- Design and prototype didactic experiments involving electricity, electronics and the laws of physics.
- Present these projects and teach low-income children and teenagers in their schools.

## Senai Cimatec

MECHANICAL DESIGNER

- Design and prototype a bench-top scissor-type lifting platform using a microwave motor.

Salvador-Bahia, Brazil

Jul. 2021 - Jul. 2022

Salvador-Bahia, Brazil

Feb. 2022 - Jul. 2022

Salvador-Bahia, Brazil

Jul. 2019 - Dec. 2019

Salvador-Bahia, Brazil

Feb. 2018 - Jul. 2019

Salvador-Bahia, Brazil

May. 2017 - Dec. 2017

Salvador-Bahia, Brazil

May. 2016 - Jul. 2016

## Relevant Research Skills

- Autonomy and self-education to develop research projects.
- Persistence and commitment.
- Capability to analyze and research state-of-the-art papers.
- Knowledge and experience in the following topics:

### Systems and Robotics

- Windows, Linux and Office.
- ROS2, Rviz and CoppeliaSim
- Creo CAD and SolidWorks
- C, C++ and Python.

### Programming and Software

- Matlab and Simulink.
- $\text{\LaTeX}$ , VBA and SQL.
- VsCode and QtCreator.
- Slicer and Paraview.

### Electrical Circuits

- Advanced Design System.
- Multisim and Protheus.
- Ltspice and MPlabX.
- Arduino IDE and ESP32.

## Teaching & Leadership Experience

### TEACHING

2015-2022 **Volunteer Teacher**, High school Mathematics and Physics

NGO GE, Salvador

2018 **Teaching Assistantship**, Elementary School Mathematics.

Módulo, Brazil

2018-2020 **Teaching Assistantship**, High school Mathematics and Physics

Portinari, Brazil

2018-2020 **Private Teaching Assistantship**, Calculus, physics, linear algebra for higher education.

Estácio, Brazil

### LEADERSHIP

2012-2014 **Volleyball Team Leader**, High School

Salvador, Brazil

2015-2019 **Music Group Leader**, Keyboardist and Guitarist at Maranata Baptist Church

Salvador, Brazil

2017-2019 **Leader of pre-university education**, at NGO GE

Salvador, Brazil

Since 2022 **Theological teaching leader**, at Maranata Baptist Church

Salvador, Brazil

## Languages

Fluent in English

Fluent in Portuguese

Advanced Spanish

Intermediary French

Beginner German

## Honors & Awards

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2016	<b>Finalist</b> , Computer Overclocking Competition at Campus Party	São Paulo, Brazil
2022	<b>Best Project of INTEGRATED LABORATORY VII</b> , Balancing robot project requested for inclusion in the electrical engineering course syllabus.	UFBA, Brazil
2022	<b>Emphasis on Automatic Control</b> , attending master's level classes during B.Sc	UFBA, Brazil
2022	<b>Healthtech Scholarship Student</b> , One of the 7 scholarship students.	Strasbourg, France

## Additional Experiences

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2022-2024	<b>French Language Course</b> , Université de Strasbourg	Strasbourg, France
2017	<b>Exchange in American Academy of English</b> , English Language Course	San Francisco, U.S.A
2017-2018	<b>German Language course</b> , PROFICI	UFBA, Brazil
2013-2015	<b>Spanish Language Course</b> , Colégio Módulo	Salvador, Brazil
2011-2013	<b>English Language Course</b> , Ebec	Salvador, Brazil
2017	<b>Vba and Macro Course in Excel</b> , PRISMA - Student-Run Company from Chemical engineering	UFBA, Brazil

## Academic References

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### Maciej Bednarczyk

PROFESSOR AND INTERNSHIP SUPERVISOR DURING MASTER'S DEGREE

- Work Address: 11, rue ampère, Haguenau, 67500, France.
- Contact: mcbednarczyk@gmail.com

Sherpa Mobile Robotics (SMR)

Robotics Architect

### Bernard Bayle

PROFESSOR AND MASTER'S SUPERVISOR.

- Work Address: Pôle API, 300 Bd Sébastien Brant, 67400 Illkirch-Graffenstaden, France.
- Contact: bernard.bayle@unistra.fr

Université de Strasbourg

Full Professor

### Antonio Lima

PROFESSOR DURING BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING.

- Work Address: R. Prof. Aristίδes Novis, 2 - Federação, Salvador - BA, 40210-630, Brasil.
- Contact: acdcl@ufba.br

Universidade Federal da Bahia

Full Professor