

# Sergio Alejandro Rosales Vargas

M.Sc. SPACE ENGINEERING

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“Aim to the stars.”

## Personal Profile

Adaptability is my main trait, I love exploring new hobbies and being challenged. My experience has forged my team work skills and fast thinking. My curiosity and perseverance are my core skills to achieve my goals and approach innovative solutions to problems.

## Work Experience

### Support of thermal tasks for JTMU 5 - Werkstudent

Bremen, Germany

ArianeGroup JTMU 5

July 2023 - June 2024

- Support for thermal model design with ESATAN and ESARAD:
  - ✓ Automation of ESATAN script generation through Python and Matlab post-processing.
  - ✓ Post processing of data for interfaces purposes in MATLAB and Python.
  - ✓ Developed an automated migration from Bazaar to Git using Python.
- **Soft Skills:** Adaptability, Communication, Decision-Making, Teamwork, Resource Management.

### Research and Development Engineer

Cochabamba, Bolivia

IMEMED

April 2020 - March 2022

- Designed and developed medical equipment prototypes: The first intensive care unit medical ventilator in Bolivia, an X-Ray portable machine of 2DOF and a PSA oxygen concentrator plant with a capacity of  $180 \text{ m}^3 \text{ h}^{-1}$ .
- Led the electronics design process of PCB prototypes using Altium Designer for the ICU ventilator from the conceptualization up to manufacturing and testing in the span of 2 years.
- Support for software development for back-end and front-end solutions in C#, Wpf and microcontroller programming in C++.
- Carried out negotiations with international technology partners, such as Masimo, Bürkert and Demcon to reach OEM solutions.
- **Soft Skills:** Leadership, Communication, Decision-Making, Teamwork, Resource Management, Negotiation skills.

### University lecturer

Cochabamba, Bolivia

Catholic University of Bolivia “San Pablo”

July 2020 - December 2020

- Teaching of the subject “Physics Fundamentals” for newly admitted students.

### Control and Automation Engineer

Cochabamba, Bolivia

AGROINBO TFD

November 2018 - December 2019

- Designed and implemented the full automation for the production of dehydrated almonds which improved productivity of the company in 300% and reduced time duration of production in 80%.
- Designed the electric layout with AutoCAD and lead the net implementation.
- Characterized the system and designed a thermal mathematical model of the almond ovens.
- Conceptualization and implementation of the closed loop control system and safety routines using a LOGO! Soft Comfort.
- **Soft Skills:** Problem-solving, Constraint optimizations, Resourcefulness, Logical thinking.

## Education

### University of Bremen

Bremen, Germany

M.Sc. in Space Engineering

April 2022 - May 2025

- **Master thesis:** Analysis of an Active Thermal Control System for the Avionics Equipment for Future Upper-Stages of a Launcher System.
- **Master project:** Research in techniques to mitigate errors of CNNs in radiation space environments.
- **Courses:** Trajectory Optimization, Spacecraft Navigation and Control, Communications Technologies for Space, Concurrent Engineering, FEM simulations for the design of space systems, Fluid Handling in spacecrafts, Structural design and analysis, Control theory, Orbital systems.

### Catholic University of Bolivia “San Pablo”

Cochabamba, Bolivia

Bachelor Degree in Mechatronics Engineering

February 2013 - February 2018

- Graduated with Honor Distinction: Top of the 2018 class.
- **Bachelor thesis:** Design and development of a prototype robot to detect cracks in drinking water pipes using Convolutional Neural Networks.
- **Skills covered:** Automation and control engineering, Signal processing, Fluid mechanics and thermodynamics, Vector mechanics.

## Skills

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<b>Programming</b>	MATLAB, Simulink, Simscape, C/C++, C# (Front-end, Back-end), Wpf, Linux, Python, Pandas, NumPy, Tensorflow (C++ and Python), VBA, R, PLC Programming, SCADA, ESATAN, ESARAD
<b>CAD Design</b>	AutoCAD, AutoCAD Electrical, SolidWorks, Ansys Mechanical, Altium Designer, Eagle Designer.
<b>Soft Skills</b>	Leadership, Adaptability, Decision-Making, Communication, Teamwork, Resource Management, Negotiation skills, Presentation skills, Perseverance, Assertiveness.
<b>Miscellaneous</b>	TeX(Overleaf/MikTeX), Microsoft Office, Git, GitHub, Bitbucket, Jira.
<b>Languages</b>	English (C1), Spanish (native), German (B2), French (A1).

## Professional development

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### Avionics Team Member

ASTRA e.V.

*Bremen, Germany*

*November 2022 - January 2024*

- Electronics designs prototyping, soldering and GPS sensor integration.
- Flight computer programming and testing the elements of the Kármán Project Rocket.

### Leadership Courses Instructor

IILC Latinamerican Institute of Leadership Cristóforos

*Cochabamba, Bolivia*

*May 2018 - November 2019*

- Instruction and planning of the oratory courses.

### IEEE Student Branch Chair

IEEE Student Branch of the Catholic University of Bolivia “San Pablo” - Cochabamba

*Cochabamba, Bolivia*

*January 2018 - January 2019*

- Founding member of the first IEEE Student Branch of the Catholic University of Bolivia “San Pablo” - Cochabamba.
- Management of the Student Branch, scheduling of activities and handling of recruitment.

### Logistics Team Member

TEDx UCB Cochabamba

*Cochabamba, Bolivia*

*May 2017 - August 2018*

- Management of logistics activities of the first TEDx event in Cochabamba.

## Projects

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### Hybrid solar car development

Catholic University of Bolivia “San Pablo”

*Cochabamba, Bolivia*

*June 2016 - November 2016*

- Management and organization of the mechanical design team and scheduling of the tasks.
- Machining and assembly of the electrical and mechanical systems.

## Publications

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### CONFERENCE PROCEEDINGS

Effect of Single Event Transient Errors on Convolutional Neural Networks for Space Applications

Sergio Alejandro Rosales Vargas, Alberto García-Ortiz

*2024 13th International Conference on Modern Circuits and Systems Technologies (MOCAST), 2024*

## Achievements

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### AWARDS

2013 - 2018 **Coca-Cola Scholarship**, Full tuition coverage for Bachelor Degree studies

*Cochabamba - Bolivia*

### CERTIFICATIONS

- 2021 **Digitalization in the Aerospace Industry**, Technical University of Munich [🔗](#) (Click)
- 2021 **Solidworks CSWP - Professional Mechanical Design**, Dassault Systèmes [🔗](#) (Click)
- 2021 **Spacecraft Dynamics and Control**, University of Colorado Boulder in partnership with Coursera [🔗](#) (Click)
- 2021 **Goethe-Zertifikat B2**, Goethe Institut
- 2018 **Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization**, DeepLearning.AI [🔗](#) (Click)
- 2018 **Neural Networks and Deep Learning**, DeepLearning.AI [🔗](#) (Click)