

# Sergio Edgardo Urzúa Correa

PHD STUDENT · ROBOTICS AND ADVANCED MANUFACTURING

Compiègne, France

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## Education

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### PhD in Robotique et Automatique

HEUDIASYC, UNIVERSITE DE TECHNOLOGIE DE COMPIEGNE

Compiègne, France

2025 - present

### PhD in Robotics and Advanced Manufacturing

CENTRO DE INVESTIGACION DE ESTUDIOS AVANZADOS DEL IPN (CINVESTAV)

Ramos Arizpe, Coahuila, Mexico

2024 - present

### M.Sc. in Robotics and Advanced Manufacturing

CENTRO DE INVESTIGACION DE ESTUDIOS AVANZADOS DEL IPN (CINVESTAV)

Ramos Arizpe, Coahuila, Mexico

2021 - 2023

### B.Sc. in Robotics Engineering

UNIVERSIDAD AUTÓNOMA DE AGUASCALIENTES

Aguascalientes, Ags, Mexico

2016 - 2020

## Professional Experience

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- 2025- **Junior Researcher**, Université de technologie de Compiègne, Heudiasyc Lab.  
**Research Assistant**, CINVESTAV, RONHIM Lab. As a master's degree student in the project *Modeling and force control of a quadrotor subject to rolling constraints*, I was in charge of modeling aerial robots, design, implement and program controllers in a experimental platform.
- 2021-

## Publications

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### PUBLISHED

**Sergio E. Urzúa-Correa**, Vicente Parra-Vega, Anand Sanchez-Orta. 2023. *3D Force Control of a Quadrotor subject to 2D Non-holonomic Contact with an Spherical Tip*. 2023 20th International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE).

Alejandro Tevera-Ruiz, **Sergio E. Urzúa-Correa**, Vicente Parra-Vega, Anand Sanchez-Orta, Rodolfo Garcia-Rodriguez. 2023. *Actor-Critic Learning of Variable Damping Injection for Quadrotor Attitude Robust Control*. 2023 20th International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE).

Carlos-Ernesto Vazquez-Garcia, Nadia-V. Garcia-Hernandez, Vicente Parra-Vega, **Sergio E. Urzúa-Correa**, Ernesto Olguín-Díaz. 2024. *3D Directional Perception using a Continuum Soft Robot: Toward a Novel Soft-haptics Paradigm*. Robotics Reports.

### SUBMITTED

**Sergio E. Urzúa-Correa**, Vicente Parra-Vega, Rodolfo Garcia-Rodriguez, Anand Sanchez-Orta. *Assist-as-Needed Damping for Attitude Tracking of Quadrotors based on Reinforcement Learning*. IEEE Transactions on Aerospace and Electronic Systems.

### IN PREP

Luis Pantoja-Garcia, Rodolfo Garcia-Rodriguez, Vicente Parra-Vega, **Sergio E. Urzúa-Correa**, Anand Sanchez-Orta. *Sliding Actor-Critic with Integral Temporal Difference Error for Robust Learning of Quadrotors*. Control Engineering Practice .

## Projects

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- 2023 **Force-Position control for a quadrotor**, Design, modeling and control of a quadrotor in contact with a rigid surface, implementation of the controller in C++ for embedded Linux and experiment design.
- 2023 **RL based control for a quadrotor**, Implementation of the controller in C++ for embedded Linux using OOP and multi-thread programming and experiments design.
- 2021 **Energy analysis of a 6-DoF robot**, Design, modeling and simulation of a 6-DoF robot to analyze the energy used with a different set of controllers.
- 2020 **Surveillance Drones**, Implementation of a quadrotor and an hexarotor with a Pixhawk and Ardupilot for surveillance of the university campus.
- 2019 **SCARA Robot**, Mechatronics design and implementation for a pick and place application using Arduino.

## Certifications

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Solidworks CSWA , Solidworks CSWP

## Languages

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Spanish (write, read, speak): Native speaker , English (write, read, speak): B2 (Linguaskill 167) French (write, read): A1

## Skills

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### SOFTWARE AND HARDWARE PROGRAMMING

C/C++, Python , MATLAB/Simulink , Java ,  $\text{\LaTeX}$  , Assembly , LabVIEW , VHDL , Linux , PLC Allen-Bradley , FPGA

### MECHANICAL DESIGN (CAD/CAE/CAM)

Solidworks , Mastercam , Solidworks CAM . Solidworks CAM

### ELECTRONIC DESIGN AND INSTRUMENTATION (CAD/CAE)

Electrical Circuits & Electronics , Solidworks PCB (Altium Designer) , Embedded Systems

### ROBOTICS AND CONTROL

Modeling & Control of Robotics Manipulators , Modeling & Control of Aerial Robots , Control Theory , Mathematical modeling of mechanical systems

## Presentations

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### CONTRIBUTED PRESENTATIONS

**Sergio E. Urzúa-Correa**. 2023. Presentation at 2023 20th International Conference on Electrical Engineering, Computing Science and Automatic Control (CCE). Conference: Centro de Investigacion y de Estudios Avanzados del IPN, Mexico City, Mexico.

## Research Experience

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### Cinvestav - Robotics and Advanced Manufacturing Group

ADVISORS: DR. VICENTE PARRA VEGA & DR. ANAND ELEAZAR SÁNCHEZ ORTA

*Ramos Arizpe, Coahuila, Mexico*

*Sep. 2021 - Dec. 2023*

## Hobbies

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Reading (Narrative & Scientific Papers) , Music (Cello & Piano)