Portfolio & Videos

Luis F. Escobar, Ph.D. Candidate

Contact Information

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Research Interests

Robotics, GNSS-denied Autonomous Systems, ROS 2, Multi-Robot Coordination, UAV Path Planning, UAV Energy Optimization, Industrial Automation, Mechatronics Design, and Engineering Education.

Education

West Virginia University 2023-May 2026 (Expected)
PhD Candidate in Robotics
Morgantown, USA
Dissertation Topic: "Energy Aware path planning for multi rotor UAVs"

University of Pennsylvania 2021-2022
PhD Student (Transferred)
Philadelphia, USA

Waseda University 2012-2015
M. Eng. in Information, Production and Systems Engineering
Kitakyushu, Japan

ITESM - Monterrey Institute of Technology 2004-2009
B. Sc. Mechatronics Engineering
Monterrey, Mexico

Research & Professional Experience

West Virginia University 2023-Present
Graduate Research Assistant
Morgantown, USA
Developing autonomous navigation stacks for GNSS-denied underground environments. Leading the complete mechatronic design and prototyping of multirotor UAVs. Implementing energy-aware optimization strategies for coverage path planning.

Universidad de las Fuerzas Armadas ESPE 2015-2021
Professor & Head of Laboratory
Sangolqui, Ecuador
Directed the Robotics Laboratory and led the "Best Research Team" (2019). Supervised undergraduate theses in industrial automation and mechatronics design.

Lainbori S.A. 2016-2021
Senior Engineer
Quito, Ecuador
Led continuous improvement initiatives for fiber optic maintenance teams. Implemented Kanban systems and Project Management strategies to optimize operational workflows.

Universidad de las Fuerzas Armadas ESPE 2009-2012
Mechatronics Program Professor
Sangolqui, Ecuador
Led the implementation of the undergraduate Mechatronics Engineering program. Coordinated curricula across Mechanics, Electronics, and IT departments. Served as the lead instructor for capstone courses as the university's sole Mechatronics Engineer.

Ternium 2009
Continuous Improvement Intern
Monterrey, Mexico
Collaborated with Six Sigma Black Belts to execute cost-reduction and safety projects. Supported manufacturing leaders in the implementation of Six Sigma tools.

Volkswagen AG 2008
Production Systems Intern
Kassel, Germany
Analyzed automatic transmission gear manufacturing within the Volkswagen Production System. Conducted time and motion studies to optimize operator ergonomics and reduce CNC setup times.

Publications

2025

- "Energy-Aware Coverage Path Planner for Multirotor UAVS", *IEEE ICUAS 2025.*
DOI: 10.1109/ICUAS65942.2025.11007830

2022

- "Implementation of Collaborative Work Between Two SCARA Robots in a Robotic Cell for Continuous Classification of Products", *Lecture Notes in Electrical Engineering.*
DOI: 10.1007/978-3-031-08288-7_7
- "Plant Layout Selection Procedure Based on Discrete Event Simulation Software", *Lecture Notes in Electrical Engineering.*
DOI: 10.1007/978-3-031-08280-1_14
- "Process Optimization with Discrete Event Simulation Software: An Experience in Ecuador Small Enterprise", *Lecture Notes in Electrical Engineering.*
DOI: 10.1007/978-3-031-08280-1_15
- "Design, Construction and Evaluation of a 3DOF Urban Planting System", *Lecture Notes in Electrical Engineering.*
DOI: 10.1007/978-3-031-08288-7_6
- "Multi-robot System for Collaborative Work Equipped with Trajectory Planning over IoT Architecture", *Lecture Notes in Networks and Systems.*
DOI: 10.1007/978-3-030-90033-5_24

2020

- "Flexible Manufacturing Systems Optimization with Meta-heuristic Algorithm Using Open Source Software", *Lecture Notes in Electrical Engineering (CIT 2020).*
DOI: 10.1007/978-3-030-72212-8_18
- "Multi-Robot platform with features of Cyber-physical systems for education applications", *IEEE ANDESCON 2020.*
DOI: 10.1109/ANDESCON50619.2020.9272030
- "Validation through a digital twin of a Stewart platform with irregular geometry with 6 DOF for simulation of a transport vehicle", *IEEE CASE 2020.*
DOI: 10.1109/CASE48305.2020.9216995
- "YaniWawa: An Innovative Tool for Teaching Using Programmable Models over Augmented Reality Sandbox", *Advances in Intelligent Systems and Computing.*
DOI: 10.1007/978-3-030-59194-6_31
- "6 DOF anthropomorphic robot as a platform for teaching robotics", *2020 IEEE/ASME AIM.*
DOI: 10.1109/AIM43001.2020.9158828
- "Construction of a Computer Vision Test Platform: VISART for Facial Recognition in Social Robotics", *Communications in Computer and Information Science.*

DOI: 10.1007/978-3-030-42520-$3_5$0

- "Development of a Social Robot NAR for Children's Education", *Advances in Intelligent Systems and Computing*.
DOI: 10.1007/978-3-030-32033-$1_3$3

2019 and Prior

- "Design of an Autonomous Mobile Robot as a Base Platform for Research of Cyber Physical Systems", *ICAT 2019*.
DOI: 10.1007/978-3-030-42517-$3_1$6

- "Mechatronics over time: 12 years of creative experiences in Ecuador", *LACCEI 2019*.
DOI: 10.18687/LACCEI2019.1.1.451

- "A New Real-Time Flight Simulator for Military Training Using Mechatronics and Cyber-Physical System Methods", *InTechOpen*, 2019.
DOI: 10.5772/intechopen.86586

- "Implementation of an IoT Architecture based on MQTT for a Multi-Robot System", *IEEE ETCM*, 2018.
DOI: 10.1109/ETCM.2018.8580321

- "Design of a Spatial Disorientation Simulator using a Modified Stewart-Gough Platform", *IEEE ETCM*, 2018.
DOI: 10.1109/ETCM.2018.8580347

- "Desarrollo de un simulador de sistemas de manufactura flexible con interfaz gráfica basado en redes de petri", *Revista Iberoamericada de Ingeniería Mecánica*, 2018.

- "Real-time flight simulator construction with a network for training pilots using mechatronics and cyber-physical system approaches", *IEEE ICPCSI*, 2017.
DOI: 10.1109/ICPCSI.2017.8392169

- "Design and implementation of complex systems using Mechatronics and Cyber-Physical Systems approaches", *IEEE ICMA*, 2017.
DOI: 10.1109/ICMA.2017.8015804

- "Kinematic resolution of delta robot using four bar mechanism theory", *IEEE ICMA*, 2017.
DOI: 10.1109/ICMA.2017.8015932

Technical Skills

- **Robotics Middleware:** ROS 2 (Navigation, Simulation, Deployment), MoCap systems.
- **Design & Prototyping:** SolidWorks, Fusion360, Catia, 3D Printing, Mechanical Analysis (CAD/CAM/CAE).
- **Embedded Systems:** Microcontrollers (ESP32, Arduino, PIC), PCB Design, Signal Processing.
- **Robotic Manipulators:** KUKA, Fanuc, Motoman, Franka Emika.
- **Programming:** Fluent in Python and C++ (Git, Linux/Ubuntu), MATLAB, LabView.

Honors & Awards

- **Fulbright Scholarship** to pursue a PhD degree in the USA (2021).
- **Monbukagakusho (MEXT) Scholarship**, Japan (2013).
- **DAAD Scholarship**, Germany (2007).
- Indian Government Scholarship for Mechatronics and its Application Program (2011).
- **Best Research Team** for Projects of National Interest, ESPE University (2019).
- **First Place:** IEEE Best Technical Chapter in Latin America (RAS) (2018, 2019).

Professional Service & Leadership

IEEE Robotics & Automation Society (RAS) - Ecuador Section

- President (2020)
- Vice-President (2019)
- Student Branch Counselor (2010-2012 and 2016-2021)

Invited Speaker & Organizer

- Delivered multiple technical seminars and workshops on Robotics and Mechatronics at various universities and government institutions across Ecuador (2015-2021), including events for the Ministry of Education and universities with active IEEE RAS student branches.

References

Dr. Guilherme A. S. Pereira
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West Virginia University
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Dr. Jason Gross
Chair and Professor
Department of Mechanical, Materials and Aerospace Engineering
West Virginia University
Email: jason.gross@mail.wvu.edu

Dr. Luis Segura
Assistant Professor
Industrial & Systems Engineering
University of Louisville
Email: ljsegu01@louisville.edu