

Dr.-Ing. Juan J. Rojas

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Profile

Engineer and researcher skilled in PCB design, 3D modeling and simulation, and system integration for cyber-physical systems and custom instrumentation. Proficient in developing, testing and modeling small-scale energy storage systems, and in creating tailored solutions for aerospace power systems. Experienced in translating complex system requirements into reliable prototypes and experimental platforms, combining hardware design, multiphysics simulation, and hands-on implementation in cyber-physical systems for aerospace and IoT applications.

Personal Information

ID: 303910836

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Education

Kyushu Institute of Technology, Doctor in Applied science for systems integration engineering 2020

Instituto Tecnológico de Costa Rica, Master in Electronics Engineering with emphasis on MEMS 2016

Instituto Tecnológico de Costa Rica, Bachelor in Electromechanical Engineering 2008

Experience

Researcher and Professor, Tecnológico de Costa Rica Feb 2014 – present
Teaching subjects such as Electricity, Electrical Control, and Instrumentation, and conducting research in cyber-physical systems, satellite power systems, and instrumentation

Maintenance Manager, Crowne Plaza Hotel Feb 2013 – June 2013
Maintenance and investments management

Project Engineer, Musmanni Corporation Apr 2012 – Dec 2012
Facilities remodeling and permits coordination

Electromechanical Instalations Engineer, Walmart Dec 2008 – Mar 2012
Coordination of electromechanical installations in construction projects

Languages

- Spanish: Native
- English: TOEFL 100/120 iBT
- Portuguese: Basic conversation
- Japanese: Beginner

Interests

- Custom-made cyber-physical systems oriented to specific user or community needs
- Custom-made instrumentation systems
- Battery characterization and modeling
- Satellite power systems

Publications

- Design of an embedded system for the control and regulation of the dynamic charging and discharging process of electrochemical cells and its subsequent validation for CubeSat 1U satellites** 28/06/2024
Kevin Gómez-Villagra, Juan José Rojas-Hernandez
[10.18845/tm.v37i3.6833](#) (Revista Tecnología en Marcha)
- Development and testing of a system for remotely sensing wind speed** 01/08/2022
Nestor Martínez-Soto, Juan J. Rojas, Gustavo Richmond-Navarro
[10.18845/tm.v35i7.6331](#) (Revista Tecnología en Marcha)
- Vertical evolution of wind turbulence intensity in complex terrain with obstacles** 01/08/2022
Gustavo Richmond-Navarro, Raziell Farid Sanabria-Sandí, Luis Enrique Castro-Rodríguez, Juan J. Rojas, Williams R. Calderón-Muñoz
[10.18845/tm.v35i7.6332](#) (Revista Tecnología en Marcha)
- Integration of an energy storage system in a wind farm: Case study** 01/08/2022
Jorge David Araya Rodríguez, Juan J. Rojas, Gustavo Richmond-Navarro
[10.18845/tm.v35i7.6333](#) (Revista Tecnología en Marcha)
- Design and development of a microfluidic platform with interdigitated electrodes for electrical impedance spectroscopy** 15/12/2021
José Miguel Barboza-Retana, Cristopher Vega Sánchez, Juan J. Rojas, Steven Quiel Hidalgo, Sofía Madrigal Gamboa, Paola Vega Castillo, Renato Rimolo Donadio
[10.18845/tm.v35i1.5389](#) (Revista Tecnología en Marcha)
- A Lean Satellite Electrical Power System with Direct Energy Transfer and Bus Voltage Regulation Based on a Bi-Directional Buck Converter** 05/07/2020
Juan J. Rojas, Yamauchi Takashi, Mengu Cho
[10.3390/aerospace7070094](#) (Aerospace)
- Design, Implementation, and Operation of a Small Satellite Mission to Explore the Space Weather Effects in LEO** 27/09/2019
Isai Fajardo, Aleksander Lidtke, Sidi Bendoukha, Jesus Gonzalez-Llorente, Rafael Rodríguez, Rigoberto Morales, Dmytro Faizullin, Misuzu Matsuoka, Naoya Urakami, Ryo Kawauchi, Masayuki Miyazaki, Naofumi Yamagata, Ken Hatanaka, Farhan Abdullah, Juan Rojas, Mohamed Keshk, Kiruki Cosmas, Tuguldur Ulambayar, Premkumar Saganti, Doug Holland, Tsvetan Dachev, Sean Tuttle, Roger Dudziak, Kei-ichi Okuyama
[10.3390/aerospace6100108](#) (Aerospace)

Certificates

- Test and Data Analysis for Quality and Reliability** on Arizona State University 04/11/2024
- Application of Electrical & Thermo-Mechanical Modeling** on Arizona State University 28/10/2024
- 2D Packaging & Assembly** on Arizona State University 18/10/2024
- Materials Selection for Thermo-Mechanical and Electrical Performance** on Arizona State University 18/10/2024
- Introduction to Packaging Materials, Manufacturing, Test, and Reliability** on Arizona State University 30/09/2024
- Introduction to Thermal Management and Mechanical Properties of Packages** on Arizona State University 25/09/2024
- Introduction to Electrical Concepts in Semiconductor Packaging** on Arizona State University 16/09/2024

<u>Introduction to Semiconductor Packaging and Design</u> on Arizona State University	09/09/2024
<u>Data Mining and Business Intelligence</u> on Instituto Tecnológico de Costa Rica	01/08/2022
<u>Big Data</u> on Instituto Tecnológico de Costa Rica	17/03/2022
<u>Statistics for Data Science</u> on Instituto Tecnológico de Costa Rica	13/01/2022
<u>Machine Learning</u> on Instituto Tecnológico de Costa Rica	23/09/2021
<u>Mathematics for Data Science</u> on Instituto Tecnológico de Costa Rica	22/07/2021
<u>Introduction to battery-management systems</u> on Coursera	03/09/2020
<u>Introduction to Embedded Systems Software and Development Environments</u> on Coursera	05/09/2019
<u>Embedded Software and Hardware Architecture</u> on Coursera	20/08/2019
<u>Converter Control</u> on Coursera	19/03/2017
<u>Converter Circuits</u> on Coursera	14/02/2017
<u>Introduction to Power Electronics</u> on Coursera	06/12/2016
<u>SolidWorks Associate - Mechanical Design</u> on SolidWorks	22/03/2014

Research

Development of a Monitoring and Alert System for the Detection of Heat Exposure in Agricultural Work: Application in Sugarcane Harvesting , Instituto Tecnológico de Costa Rica Design, integration, verification, and validation of the monitoring and alert system	Jan 2025 – Dec 2027
Development of a Scalable and Modular Technological Platform for the Registration of Physical and Chemical Variables Associated with the Quality and Abundance of Drinking Water , Instituto Tecnológico de Costa Rica Integration of chemical sensing systems into the monitoring system for rural aqueducts	Jan 2025 – Dec 2027
ASADAS-IoT: Development and Transfer of a Scalable, Modular, and Open Technological Platform for the ASADA of Paso Ancho, Oreamuno, Cartago , Instituto Tecnológico de Costa Rica Design, integration, verification, validation, and implementation of the monitoring system for rural aqueducts	Jan 2025 – Dec 2026
Predictive Maintenance: Development of Diagnostic and Prognostic Systems , Instituto Tecnológico de Costa Rica Prediction of battery health using existing datasets	Jan 2024 – Dec 2025
Development of a Pilot Digitalization Plan in ASADAS: Towards Better Water Resource Utilization through IoT Systems , Instituto Tecnológico de Costa Rica Implementation of a pilot integrated monitoring system for rural aqueducts	May 2023 – Dec 2023
Development of an Integrated System for CubeSat Power System Testing , Instituto Tecnológico de Costa Rica Design, integration, verification, and validation of the testing system	Jan 2022 – June 2024
Diagnosis of the Potential for Digital Transformation of Rural Aqueduct Administrative Associations (ASADAS) in the Chorotega Region , Instituto Tecnológico de Costa Rica Interviews and analysis with stakeholders for digital transformation initiatives	Jan 2022 – June 2023
Development of a Charger/Discharger System for Electrochemical Cell Screening and Testing , Kyushu Institute of Technology (Center for Nanosatellite Testing) Design, integration, verification, and validation of the testing system	Oct 2016 – Oct 2016

Ten-Koh Satellite , Kyushu Institute of Technology (OkuyamaLAB) Design, integration, and verification of the power subsystem	Sept 2016 – Nov 2018
BATSU-CS1 CubeSat (Irazú Project) , Instituto Tecnológico de Costa Rica Definition and programming of flight segment operations, environmental testing, and system integration	Feb 2016 – June 2018
Design and implementation of an Electrical Impedance Spectroscopy System for Bioengineering Applications , Instituto Tecnológico de Costa Rica Fabrication and testing of multiple microfluidic devices	Jan 2016 – Dec 2019