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D.Eng. 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: C1 OTE
- 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, Raziel 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

Basic programmable logic controller on Instituto Tecnológico de Costa Rica 01/10/2025

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

Introduction to Semiconductor Packaging and Design on Arizona State University 09/09/2024

Data Mining and Business Inteligence on Instituto Tecnológico de Costa Rica 01/08/2022

Big Data on Instituto Tecnológico de Costa Rica 17/03/2022

Statistics for Data Science on Instituto Tecnológico de Costa Rica 13/01/2022

Machine Learning on Instituto Tecnológico de Costa Rica 23/09/2021

Mathematics for Data Science on Instituto Tecnológico de Costa Rica 22/07/2021

Introduction to battery-management systems on Coursera 03/09/2020

Introduction to Embedded Systems Software and Development Environments on Coursera 05/09/2019

Embedded Software and Hardware Architecture on Coursera 20/08/2019

Converter Control on Coursera 19/03/2017

Converter Circuits on Coursera 14/02/2017

Introduction to Power Electronics on Coursera 06/12/2016

SolidWorks Associate - Mechanical Design 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 — Jan 2025 – Dec 2027

Design, integration, verification, and validation of the monitoring and alert system

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 — Jan 2025 – Dec 2027

Integration of chemical sensing systems into the monitoring system for rural aqueducts

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 — Jan 2025 – Dec 2026

Design, integration, verification, validation, and implementation of the monitoring system for rural aqueducts

Predictive Maintenance: Development of Diagnostic and Prognostic Systems, Instituto Tecnológico de Costa Rica — Jan 2024 – Dec 2025

Prediction of battery health using existing datasets

Development of a Pilot Digitalization Plan in ASADAS: Towards Better Water Resource Utilization through IoT Systems, Instituto Tecnológico de Costa Rica — May 2023 – Dec 2023

Implementation of a pilot integrated monitoring system for rural aqueducts

Diagnosis of the Potential for Digital Transformation of Rural Aqueduct Administrative Associations (ASADAS) in the Chorotega Region, Instituto Tecnológico de Costa Rica — Jan 2022 – June 2023

Interviews and analysis with stakeholders for digital transformation initiatives

Development of an Integrated System for CubeSat Power System Testing, Instituto Tecnológico de Costa Rica — Jan 2022 – June 2024

Design, integration, verification, and validation of the testing system

Development of a Charger/Discharger System for Electrochemical Cell Screening and Testing, Kyushu Institute of Technology (Center for Nanosatellite Testing) Oct 2016 – Oct 2016
Design, integration, verification, and validation of the testing system

Ten-Koh Satellite, Kyushu Institute of Technology (OkuyamaLAB) Sept 2016 – Nov 2018
Design, integration, and verification of the power subsystem

BATSU-CS1 CubeSat (Irazú Project), Instituto Tecnológico de Costa Rica Feb 2016 – June 2018
Definition and programming of flight segment operations, environmental testing, and system integration

Design and implementation of an Electrical Impedance Spectroscopy System for Bioengineering Applications, Instituto Tecnológico de Costa Rica Jan 2016 – Dec 2019
Fabrication and testing of multiple microfluidic devices