



## SESIÓN TÉCNICA

-AGENDA DETALLADA-

*Actualizada a 28 de noviembre. Por favor tengan en cuenta que dada la naturaleza y dimensiones de la Conferencia podrían producirse cambios de última hora*

JUEVES 28 DE NOVIEMBRE

**SESIÓN DE MAÑANA (10.00 - 12.00)**

**SALÓN CAHUITA 1**

**SESIÓN 01: TECNOLOGÍA PARA AGRICULTURA + SISTEMAS CIBERFÍSICOS**

Chairperson: Ignacio Trejos Zelaya

- 1 - Agriculture 4.0 in Central America: Current Status, Challenges, and Future Trends
- 2 - Assessment of Nitrogen Fertilization in Sugarcane Using Multispectral Photogrammetry
- 3 - Design and Development of Digital Twin Flow Control and FPC Level Application using Mixed and Augment reality
- 4 - Development of a Portable Air Quality Sensor Prototype for Real-Time Environmental Analysis
- 5 - Benchmarking of Microcontroller-based Platforms for EdgeAI Applications
- 6 - Dynamic response of an educational haptics device with a viscoelastic force model for soft tissue

**SALÓN CAHUITA 2**

**SESIÓN 04: INTELIGENCIA ARTIFICIAL (INCLUYE PROCESAMIENTO DEL LENGUAJE NATURAL)**

Chairperson: Steven Pacheco Portuguese

- 1 - Guided Data Augmentation by Transfer Function using Uncertainty Scores for Medical Image Classification
- 2 - Using the Mahalanobis Distance as a Dataset Comparison Metric for Semi-Supervised Detection of COVID-19 in Chest X-rays
- 3 - Generative IA-based tool for efficient processing of Human Rights violations-related news [sic]
- 4 - Improving Space Weather Forecasting with GESD: A Generative-Evolutionary Synthetic Data Approach
- 5 - Enhancing Sexism Detection with Ensemble Language Models
- 6 - Engineering in Service of the Population with Disabilities: The Right to Play

**SALÓN GÓNDOLA**

**SESIÓN 07: CÓMPUTO DE ALTO RENDIMIENTO + SIMULACIÓN Y MODELAJE DE SISTEMAS COMPLEJOS**

Chairperson: Gustavo Núñez Segura

- 1 - Hierarchical energy management system with demand side management for green hydrogen-based microgrids
- 2 - Dynamic Models for Estimating the U.S. Treasury Yield Curve for the Costa Rica Central Bank
- 3 - Quantifying the performance of decoding algorithms using Graphic Processing Units for the RICH subdetector at LHCb
- 4 - Implementing Multi-GPU Scientific Computing Miniapps Across Performance Portable Frameworks
- 5 - Estimation of Operation Areas and Environmental Parameters for High-Altitude Balloon Missions
- 6 - Measurement Range in Fringe Projection Profilometry: A Practical Case

## **PAUSA PARA ALMUERZO (12.00 - 14.00)**

### **PRIMERA SESIÓN DE TARDE (14.00 - 15.30)**

#### **SALÓN CAHUITA 1**

##### **SESIÓN 02: INGENIERÍA PARA LA MEDICINA Y LA BIOLOGÍA**

Chairperson: Andrés Segura-Castillo

- 1 - Advances in flexible solar cells for clothing, types, characteristics and uses
- 2 - Structural miRNA-lncRNA Interaction Database: Integrating Structural Insights for Enhanced Predictive Modeling
- 3 - An IMU-based Gait Acquisition System for Biomechanical Analysis
- 4 - Design of a Pilot Data Network for Educational Institutions in the Canton of Gualaceo, Ecuador

#### **SALÓN CAHUITA 2**

##### **SESIÓN 05: CIRCUITOS Y SISTEMAS I**

Chairperson: Jorge Castro-Godínez

- 1 - Improving Pre-Route Delay Estimations in Open-Source EDA Tools via Machine Learning
- 2 - Harnessing Design History and Machine Learning for Precise Delay Estimation in Open Source EDA
- 3 - Lossless 1.6 Mbits/s FPGA-based Real-Time Data Transmission System for Converse ME Sensors
- 4 - Resource-Efficient FPGA-based I/Q-Demodulator Detects 0.0005 Modulation Index with 9.5 dB SNR for Converse ME Sensors

#### **SALÓN GÓNDOLA**

##### **SESIÓN 08: SISTEMAS Y DISPOSITIVOS ELECTRÓNICOS I**

Chairperson: Matías Díaz Díaz

- 1 - Battery Cell State of Charge Control in AC Battery Using a Consensus-Based Distributed Control Scheme implemented with Hardware-in-the Loop
- 2 - An Enhanced Framework for Sequence-Based Model Predictive Control applied to Grid-Tied Converters with LCL Filters
- 3 - Hardware-in-the-Loop Assessment for Continuous Set Model Predictive Control of a Modular Multilevel Matrix Converter
- 4 - Sustainable Microgrid Solution for Improving Energy Resilience on Coco's Island

## **PAUSA PARA CAFÉ (15.30 - 16.00)**

### **SEGUNDA SESIÓN DE TARDE (16.00 - 18.00)**

#### **SALÓN CAHUITA 1**

##### **SESIÓN 03: MICROREDES**

Chairperson: Juan Zúñiga Gutiérrez

- 1 - Trends and Outlook of BESS in Electrical Grids of Latin America
- 2 - Impact assessment of the technical regulation on the sizing of PV module arrays for a grid-connected PV power system in an academic complex
- 3 - Preliminary Power Hardware in the Loop Simulation of a Microgrid Test Bench in OPAL-RT
- 4 - Assessment of the Techno-Economic Feasibility of an Isolated Hybrid SPV/Wind/Diesel/Hydrogen /Battery System
- 5 - Development of Photovoltaic Systems for Indigenous Communities in Amazonia

**SALÓN CAHUITA 2**

**SESIÓN 06: ENERGÍAS RENOVABLES I**

Chairperson: Reynaldo Iracheta Cortez

- 1 - Economic Benefits of Partial Discharge On-Line Monitoring on Sugar Cane Co-Generation Plants
- 2 - Preliminary Location of Fast Charging Stations for EVs Along National Corridors: A Case Study
- 3 - Optimization of Energy Storage in Hybrid Solar Photovoltaic/Biomass/Diesel Generator System Considering Battery Life Time
- 4 - Design and Economic Feasibility Assessment of a Wind Farm to satisfy the Energy Demand of the University of the Isthmus, Juchitan Campusnu
- 5 - Analysis of the expansion of the 5 de Noviembre Hydroelectric Power Plant using ML algorithms

**SALÓN GÓNDOLA**

**SESIÓN 09: INGENIERÍA DEL SOFTWARE Y DE SISTEMAS + CIBERSEGURIDAD**

Chairperson: Ignacio Trejos Zelaya

- 1 - Enhancing the UR-OS Simulator for Teaching Memory Management
- 2 - S-Boxes Generation Using Chaotic Maps without Fixed Points
- 3 - A System-Level Design for a Public Transportation Information System in Costa Rica
- 4 - Proposal of a base structure for a software project management methodology
- 5 - Machine Learning for Distributed Denial of Service Attack Detection in Software-defined IoT
- 6 - Analyzing the Weaknesses of Public Policies for Exceptional Talents in Colombia

**CONCAPAN**  
*FIN DE LA JORNADA JUEVES*  
**XLII** COSTA RICA  
2024

VIERNES 29 DE NOVIEMBRE

**SESIÓN DE MAÑANA (10.00 - 13.00)**

**SALÓN CAHUITA 1**

**SESIÓN 10: OPERACIÓN Y PLANEAMIENTO ENERGÉTICO I**

Chairperson: Carlos Eugenio Martínez Cruz

- 1 - Costa Rica's Electric Grid: A System Overview and Modeling Parameters for Power and Energy Studies
- 2 - Distributed Generation in Costa Rica: how do regulation changes move the numbers in the residential sector?
- 3 - Swift steady-state solution of large-scale power systems including PV sources using discrete models
- 4 - Experience of Congestion Analysis in Peruvian Power System Transmission Planning
- 5 - Analysis of Frequency in El Salvador's Power Grid: Understanding the period of 2022 to 2023
- 6 - Leveraging Temporal Patterns in Electricity Price Forecasting with Cluster-Based Feature Engineering and Temporal Fusion Transformers
- 7 - Improving Accuracy in Nodal Marginal Costs and Active Energy Valuation Using PMUs in Peruvian Electricity Market Framework
- 8 - A Real-Time Framework Design for Local Energy Markets Under a Generalized Nash Equilibrium considering Prosumers-Utility Electricity Market

**SALÓN CAHUITA 2**

**SESIÓN 13: OPERACIÓN Y PLANEAMIENTO ENERGÉTICO II + MAQUINARÍA Y ELECTRÓNICA EN POTENCIA Y ENERGIA I**

Chairperson: Andres Argüello Guillén

- 1 - Residential Power Satisfaction as a Demand Side Management Approach in Puerto Rico
- 2 - Technical and Financial Analysis of the Integration of Electrochemical Storage Systems in the Costa Rican Power System
- 3 - Advancing Electromobility in Central America: An Analysis of Policies and Regulations
- 4 - Analysis of Bifacial Photovoltaic System Configurations for Enhanced Grid Integration: A Case Study of Costa Rica's Load Demand Profile
- 5 - Measurement-based Analysis of the Harmonic Couplings Below the Switching Frequency of Single-Phase Inverter-Based Resources
- 6 - Generator Redispatch Strategy for Transmission Line Connection Guarded by Synchro-check Devices
- 7 - Surge Testing in Low-Voltage Three-Phase Motors with Random Winding: A Case Study Demonstrating Its Effectiveness.
- 8 - Controlled overvoltage DC testing on low voltage three-phase motors: two study cases showing its effectiveness.
- 9 - Technological Evolution of Medium Voltage Cables

**SALÓN GÓNDOLA**

**SESIÓN 16: MAQUINARÍA Y ELECTRÓNICA EN POTENCIA Y ENERGIA II + SISTEMAS DE POTENCIA Y ENERGÍA**

Chairperson: Rodolfo García Colón

- 1 - An efficient and accurate technique for the reduction of power systems based on discrete equivalent frequency-dependent model
- 2 - Thermal Analysis for Designing Wind Turbines based on RF-PMSGs
- 3 - Designing a battery state estimator considering the challenges for real-world applications
- 4 - Simplified Method for Measuring Tangent Delta
- 5 - Protections in Electrical Power Systems: Setup of Simulations and Laboratory Experiments
- 6 - Use of Surface Treatment of Conductors for Recapacitation of Transmission Lines and Asset Renovation
- 7 - Machine learning techniques for fault detection in simulated synchrophasors data 25kV distribution feeder.
- 8 - Energy Flexibility: A Systematic Review with a Perspective from Latin America

## **PAUSA PARA ALMUERZO (13.00 - 14.00)**

### **PRIMERA SESIÓN DE TARDE (14.00 - 15.30)**

#### **SALÓN CAHUITA 1**

##### **SESIÓN 11: TELECOMUNICACIONES PARA EL PRESENTE Y EL FUTURO**

Chairperson: Gustavo Núñez Segura

- 1 - Advancements and Trends in IoT Applications for Education: A Bibliometric Analysis
- 2 - Low power datalogger for hydrometeorological variables in high mountain based on ESP32, LDO with low quiescent current and P-channel MOSFET
- 3 - Design of Polymer Optical Waveguides for the Detection of Azo Dye Water Contaminants

#### **SALÓN CAHUITA 2**

##### **SESIÓN 14: CIRCUITOS Y SISTEMAS II**

Chairperson: Erick Carvajal

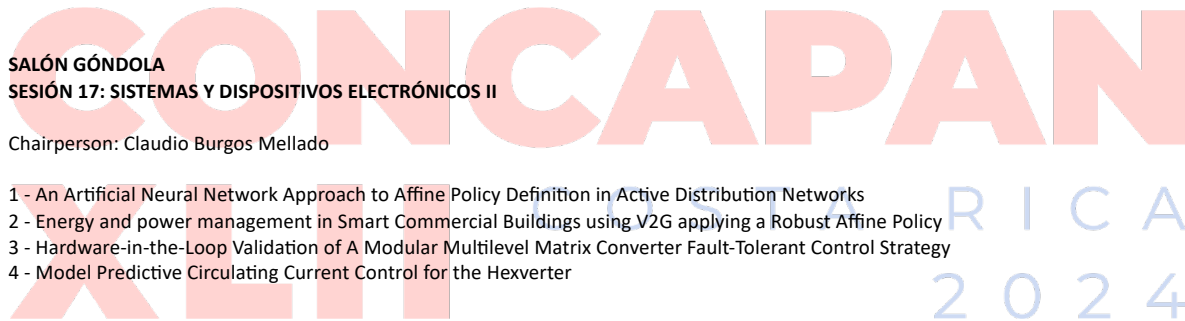
- 1 - Using pulsed-latch scan chains for non-destructive ASIC testing
- 2 - Configurable High-Level Synthesis Approximate Arithmetic Units for Deep Learning Accelerators
- 3 - LLM Acceleration on FPGAs: A Comparative Study of Layer and Spatial Accelerators
- 4 - Exploring DNN Robustness Against Adversarial Attacks Using Approximate Multipliers

#### **SALÓN GÓNDOLA**

##### **SESIÓN 17: SISTEMAS Y DISPOSITIVOS ELECTRÓNICOS II**

Chairperson: Claudio Burgos Mellado

- 1 - An Artificial Neural Network Approach to Affine Policy Definition in Active Distribution Networks
- 2 - Energy and power management in Smart Commercial Buildings using V2G applying a Robust Affine Policy
- 3 - Hardware-in-the-Loop Validation of A Modular Multilevel Matrix Converter Fault-Tolerant Control Strategy
- 4 - Model Predictive Circulating Current Control for the Hexverter



## **PAUSA PARA CAFÉ (15.30 - 16.00)**

### **SEGUNDA SESIÓN DE TARDE (16.00 - 18.00)**

#### **SALÓN CAHUITA 1**

##### **SESIÓN 12: ROBÓTICA Y MECATRÓNICA**

Chairperson: Felipe Meza Obando

- 1 - Atta-Bot: A Do-It-Yourself approach for swarm robotics
- 2 - Physical Validation of a Synchronization and Formation Control Algorithm for Multi-Agent Robotic Systems
- 3 - Physical Validation of PSO and ACO Based Algorithms for Multi-Agent Robotic Systems
- 4 - A Bipedal Robot Diffuse Logic Equilibrium Control
- 5 - Load cell system designed to estimate interaction forces in robotic applications

## **SALÓN CAHUITA 2**

### **SESIÓN 15: EDUCACIÓN Y COMPUTACIÓN + TECNOLOGÍA HUMANITARIA**

Chairperson: Ignacio Trejos Zelaya

- 1 - Game Jams as a STEAM learning experience to complement computer engineering curricula
- 2 - AI-Driven Innovations in Higher Education: Improving Lesson Planning and Teaching Quality at UABC
- 3 - Improving the Efficacy of an Automated Judging System in an Introductory Programming Class using a Large Language Model
- 4 - Harnessing Artificial Intelligence in Education: Innovations, Opportunities, and Challenges
- 5 - Development of STEM Competences and Soft Skills for future engineers: Science Girl Camp

## **SALÓN GÓNDOLA**

### **SESIÓN 18: ENERGÍAS RENOVABLES II**

Chairperson: Carlos Osmin Pocasangre Jiménez

- 1 - Experience in the use of an In-House Mathematical Model for Short-Term Hydrothermal Economic Dispatch in Peru
- 2 - Santa Cruz, Galapagos: Strategy to transform the energy matrix into 100% renewable by 2030
- 3 - Trends in Renewable and Decentralized Energy Grids: A Comparative Study between Brazil and Central America
- 4 - A Novel Methodology for the Realization of Failure Modes, Effect and Criticality Analysis to Wind Turbines
- 5 - Maximum Power Point Tracking MPPT Control Based on Neural Networks for Photovoltaic Panels Implemented in Typhoon HIL
- 6 - Underground DC Cable Sizing with Cyclical Loading in Utility-Scale Solar Applications

**CONCAPAN**  
**FIN DE LA JORNADA VIERNES Y DE LA SESIÓN TÉCNICA**  
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