IEEE International Conference on Industrial Technology

Tuesday 3 March 2026

14:00-18:00	Auditorium — Training **Registration**
18:00-20:00	Auditorium — Coffee Break **Welcome Reception**

Wednesday 4 March 2026

08:45-09:15	Auditorium — Keynote **Opening Ceremony**
09:15-10:15	Auditorium — Technical Session **Internet of Things, Cyber-Physical Systems, and Cybersecurity** Chairs: Anil Riza Bektas, Sebastian Leclerc **Reducing IoT Data at the Edge: A Comparative Evaluation** *Sebastian Leclerc, Emma Hansen, Alessio Bucaioni, Mohammad Ashjaei* **Process Modeling and Automation of AAS-Based Interactions in Industry 4.0** *Anil Riza Bektas, Jurgen Roßmann* **Embedding Human Participation in Industry 4.0 Processes: A Cross-Platform HMI Framework based on the Proactive Asset Administration Shell** *Anil Riza Bektas, Jurgen Roßmann* **Optimal Defense Resource Allocation Considering Metering Configuration in AC Power Systems** *Bowen Xu, Mengxiang Liu, Ruilong Deng*
	Room_B — Technical Session **Industrial Automation, Communication, and Manufacturing** Chairs: Aydin Homay, Benedict Janssen **Ambiguity of Design in Software Systems - With Extension on Industrial Control and Automation Software Systems** *Aydin Homay, Christos Chrysoulas* **Complexity and Coupling in Industrial Control and Automation Systems** *Aydin Homay, Martin Wollschlaeger* **Analysis of performance indicators to identify vulnerabilities in global production networks** *Benedict Janssen, Seth Schmitz, Gunther Schuh* **Traffic-Aware Configuration of OPC UA PubSub in Industrial Automation Networks** *Kasra Ekrad, Bjarne Johansson, Inés Álvarez, Saad Mubeen, Mohammad Ashjaei*
	Room_C — Technical Session **Real-time and Data-based Innovations in Intelligent Cyber-Physical Systems** Chairs: Alma Y. Alanis, Sahar Mobaiyen **Latency-Aware Industrial CPS for Connected Mobility: Real-Time Benchmarks from NMPC to Edge Lookup Policies** *Arnon Santos,*

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Marco Antonio Zanata Alves, Luiz Eduardo Oliveira

Cross-Partition Memory Interference in Software-Partitioned GPUs for Real-Time Tasks *Sahar Mobaiyen, Mikael Sjodin, Saad Mubeen*

Modified Soft Margin Optimal Hyperplane with Metaheuristic Optimization of Hyperparameters: Application to Heart Disease Diagnosis *Mario Antonio Ruz Canul, Jose A. Ruz-Hernandez, Alma Y. Alanis, Javier Sigales, Ramon Garcia-Hernandez, Jany Hernández*

Multi-Scale Dependency Extraction of Blast Furnace Temperature Prediction via Frequency-Adaptive Normalization *Jingyi Wang, Jiabo Li, Shanying Zhu*

10:15-10:30

Coffee Corner

Coffee Break

Coffee Break

10:30-11:30

Auditorium

Keynote

Data Center Challenges: Powering “the AI Factories”

Data Center Challenges: Powering “the AI Factories”

Prof. Don Tan IEEE Vice President Technical Activities, Founder and CTO E2 Systems, USA

Abstract: As the GPU (TPU) computation cost plummeted by almost 100%, AI continues its march from generative to agentic. In the meantime, the demand for power is skyrocketing. Recent projections by Microsoft/Google/ Meta forecast the power per rack is going from the current 100kW to the future 1MW. And the overall power demand for “AI factories” worldwide is doubling to be 1,000 TWh annually by 2030, as predicted by Delloitte. The ever-increasing power demand poses unprecedented challenges for the power, electronics, and computing industries. A brief history for powering computing industry is first recapped, followed by current challenges in power, thermal management, networking and workforce development. The power system architecture options are then presented, and key features for future architecture are discussed. Flexible electronic Large Power Transformers (FeLPTs) are emerging as a critical technology node. Key FeLPTs circuit options are discussed. Challenges in interfacing with power grids are detailed. Structured microgrids are natural candidates for efficient and effective data center power and energy management. Desired features for architecting the UPS systems, together with their required storage capacity, are then presented. In-rack and off-board power processing solutions are then proposed. Challenges in on-board power processing are elaborated, together with desired enabling characteristics for future sub-volt designs.

Keynote Speakers: Don Tan

11:30-13:00

Auditorium

Industry Forum

Industry Forum

AI-Driven Observability and Causal Correlation in Modern Operational Environments

Mario Romero Head of Intelligent Observability Engineering, SAP, Mexico

Santiago Reyes Chávez Innovation & Development Engineer, SAP, Mexico

Wednesday 4 March 2026

Abstract: In today's distributed, multi-stack operational environments, different monitoring tools generate massive volumes of alerts that are often siloed and viewed in isolation, causing slowness in incident resolution. This session explores how advanced observability platforms leverage cross-system data correlation and artificial intelligence to transform fragmented telemetry into actionable insights. Drawing on patented work in AI-augmented observability, we will demystify how correlated alert aggregation, contextual enrichment, and machine learning models (including large language models) can identify common root causes across heterogeneous systems. You will learn how enriched alert signals are analyzed for temporal, structural, and service dependencies; how AI models help infer causation rather than mere coincidence; and how human-centric outputs enable faster remediation and improved operational reliability. Attendees will walk away with practical strategies for integrating AI-based correlation into observability practices, reducing mean time to resolution, and enabling a shift from reactive troubleshooting to proactive causation understanding in complex enterprise operations

Manufacturing 3D Printable Filament with Poly-lactic acid (PLA) and Brewer Spent Grain (BSG)

Prof. Leonardo Chávez Guerrero Agacel Nanotecnologías / RecyProtein / Universidad Autónoma de Nuevo León, Mexico

Abstract: 3D printing has emerged as a transformative element for sectors such as manufacturing and prototype/product development, enabling model customization and on-demand manufacturing, and establishing itself as an essential tool for innovation. This study focuses on the valorization of organic waste such as malted barley bagasse, a lignocellulosic material, for the manufacture of biocomposites suitable for 3D printing. The proposed methodology covers pretreatment and pulverization of the raw material, incorporation of the raw material into a polylactic acid (PLA) matrix by extrusion, and optimization of filament manufacturing parameters. The characterization focuses on studying its composition using Fourier transform infrared spectroscopy (FTIR), identifying the main functional groups of maltose present in the matrix, such as the carbonyl group at 1750 cm {ªand stretching vibrations of the (C-O) in the ester group at 1083 cm {¹çcharacteristic of PLA, as well as stretching vibrations of the (C-O) bonds between 1000 cm {ªand 1200 cm {¹ętypical of polysaccharides such as barley. Additionally, scanning electron microscopy (SEM) was used to obtain images of the surface morphology, providing a clear view of the protein nanoparticles, which are 40-80 nm in size and can be easily integrated into the composite. This work seeks to offer innovative solutions for waste management and sustainable manufacturing, promoting the principles of the circular economy and reducing the beer industry's environmental impact.

Chairs: Carlos Luna Criado

Keynote Speakers: Leonardo Chávez Guerrero, Mario Romero, Santiago Reyes Chávez

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13:00-14:00	Lunch Room — Lunch **Lunch**
14:00-15:30	Auditorium — Technical Session **Data-driven Fault Diagnosis, Detection, and control in Industrial Systems** Chairs: Michael Theiler **Modeling and Control of a Triple Active Bridge–Based UPS with Integrated Active Power Buffer** *Ahmad Rammal, Jean Sawma, David Frey, Seddik Bacha, Hadi Kanaan* **Explaining Vibration Patterns and Fault Diagnoses in the Oil Industry via Finetuned Chatbot** *Nilo Monteiro, Alexandre Rodrigues, Flávio Varejão, Marcos Ribeiro, Thiago Oliveira-Santos* **Cross-Cell Monitoring for Fault Detection in Battery Systems: Sensitivity to Initial Cell-to-Cell Variations** *Michael Theiler, Christian Endisch* **Applications of Large Language Models in Microgrids: A Literature Review** *Adam Adib, Kamal Al-Haddad, Lyne Woodward* **BLDC Motor Fault Detection through Decision-Level and Data-Level Fusion Strategies** *Adam Filapek, Kacper Jarzyna, Waldemar Bauer* **Conditional WGAN-GP for Acoustic Anomaly Generation in Dam Structural Health Monitoring** *Yuanzhe Hu, NAICHENG CHEN, Kefan Zhang, Aquil Mirza MOHAMMED*
	Room_B — Technical Session **Artificial Intelligence and Industrial Informatics** Chairs: Muhammad Uddin, Thiago Oliveira-Santos **evEntropy: An Information-Theoretic Framework for Temporal Event-Based Time Series Analysis** *Ali Abbasi, Nelson Ricardo Rodrigues* **SmartFlow-PdM: A Hybrid Framework using Differential Degradation Features for Industrial Predictive Maintenance** *FERNANDO VELASCO-LOERA, MILDRETH ALCARAZ-MEJIA, JOSE CHAVEZ-HURTADO* **Fault Diagnosis Explanation with Decision Trees and Large Language Models** *Luciano Henrique Peixoto da Silva, Theo de Sá, Nilo Monteiro, Alexandre Rodrigues, Flávio Varejão, Marcos Ribeiro, Thiago Oliveira-Santos* **A Data-Driven Digital Twin for Predicting Manufacturing Process Efficiency** *Muhammad Uddin, Michele Lora, Davide Cannizzaro, Davide Maria Gatta, Franco Fummi* **Product Design of Video Analytics Applied to Ternium's Industrial Environment** *Michel Alvarez Cancio, Andrés Gómez, Matías Sisterna* **Vision-Based 3D Fruit Localization for Robotic Harvesting Using Recursive State Estimation** *Yinglun Wang, Gao Zhao, Taitian Xiang, Ka-Hing Wong*
	Room_C — Technical Session **Work In Progress (WiP)** Chairs: Alison Garza Alonso, Yan-Jun Pan **Implementation of Peak Current Control to a Buck Voltage**

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Converter for a 5 kW Alkaline Electrolyzer *Miguel-Angel Gonzalez-Ramirez, Nancy Mondragón-Escamilla, Ismael Araujo-Vargas, Pedro-Enrique Velázquez-Elizondo, Anahi Guerra-Elguera*

A High-Order Fully Actuated Predefined-Time Robust Control Strategy for DC Motors *Alison Garza-Alonso, Pablo Rodriguez-Ramirez, Michael Basin*

Identifying Road Conditions by Sliding Windows Approach on Inertial Measurement Signals *David Meza Garcia, Julio Rodriguez, M. Fernanda López-Barajas, Oleg Sergiyenko, Wendy Flores-Fuentes, Moises J. Castro-Toscano, Paolo Mercorelli*

Design and Implementation of ROLLS (Rotational and Linear Learning System): A Dual Brushless-Motor Ball-Balancing Platform for Education and Research *Victor Benitez, Jesus Pacheco, Mario Gomez, Agustín Brau-Avila*

Disaggregation of Superposed Time-Series: Device Detection in Aggregated Load Profiles *Benedikt Herold, Stefan Wilker, Thilo Sauter*

Intelligent Model for Dynamic PFMEA Implementation in Test Stations for Industry 4.0 *Eduardo Rangel-Carrillo, Alma Y. Alanis, Jesus G. Alvarez*

A Hybrid Onshore Power Supply Architecture Using Inductive Power Ship Charging *Daniel Jesus, Tiago Oliveira, Marina Perdigão, André Mendes*

Dynamic Real-time Output Allocation Mechanism for a Multilevel Multiport Onshore Power Supply *Tiago Oliveira, Luís Caseiro, Marina Perdigão, André Mendes*

15:30-15:45

Coffee Corner

Coffee Break

Coffee Break

15:45-17:15

Auditorium

Tutorial

Recent Advances, Challenges and Future Trends of Machine Learning and Mode Free Predictive control Applied to Power Electronics

Recent advances in embedded computing platforms, including FPGAs, DSPs, and heterogeneous SoC architectures, have enabled the real-time implementation of Machine Learning (ML) algorithms in industrial systems. In power electronics, where converters operate under nonlinear dynamics, parameter uncertainty, and rapidly changing conditions, traditional model-based control strategies often face performance and robustness limitations. In this context, Machine Learning and Model-Free Predictive Control (MFPC) have emerged as powerful alternatives. Reinforcement learning and data-driven predictive approaches allow controllers to adapt using real-time measurements without requiring accurate mathematical models, improving flexibility and robustness in complex operating scenarios. This tutorial provides a concise yet comprehensive overview of recent advances, key challenges, and future trends in Reinforcement learning and MFPC applied to power converters. It covers theoretical foundations, implementation constraints, computational trade-offs, and real-time deployment aspects. Special attention is given to robustness, explainability, and industrial feasibility. The objective is to bridge academic research and practical deployment, equipping participants with a structured understanding of how data-driven and model-free strategies are reshaping next-generation power electronic systems.

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Chairs: Felipe Ruiz Allende, Giovanny Sanchez, Juan Gerardo Avalos

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08:45-10:15

Auditorium — Technical Session

Signals, Image Processing, and Computational Intelligence

Chairs: Jesus Mejia Ortiz, Wendy Flores-Fuentes

- **A New MMC-based Architecture for Enhanced Fault Resilience in Onshore Power Supply Systems** *Tiago Oliveira, André Mendes, Marina Perdigão, Luís Caseiro*
- **EGGS: Event-Guided Gaussian Splatting for Sharp 3D Reconstruction from Blurred Images** *Gu Gong, Qiang Wang, Navarro-Alarcon David, Zhen He*
- **WA-YOLO: A Wavelet-Transform-Enhanced Attention YOLO for Car Paint Defect Detection** *Tianyi Liu, Qiang Wang, Jiaxuan Liu*
- **EV Charging Socket Detection using YOLO for High Precision Robot Manipulation** *NYEIN HTIKE ZAW, Qiang Wang*
- **A Hierarchical Selection of Instance Segmentation Models for Wind Turbine Blade Defect Detection** *Juan Pablo Carballal, Juan Pedro Maestrone, Mauricio Olivera, Agustín López, Juan Pirotto, Facundo Benavides, Guillermo Carbajal, Rafael Canetti*
- **Modeling Energy Potential Under Physicochemical Analysis Of Biomass For Biofuel Production** *Jesus Mejia Ortiz, Yolocuauhtli Salazar Muñoz, Cynthia Adriana Nava Berumen, Artemio Carrillo Parra, Ruben Guerrero Rivera*

Room_A — Technical Session

Power Electronics, Energy, and Smart Grids

Chairs: Gabriel Esteban Narvaez Morales, Nelson Ricardo Rodrigues

- **Sliding-mode control in the dq-reference frame for a three-phase CSI feeding an isolated load** *Pau Boira Pujol, Arnau Doria-Cerezo, Robert Grino*
- **Embedded Implementation and Validation of a PI-Controlled Hydrokinetic Energy Conversion System for Low-Head River Applications** *Diego Herrera Jaramillo, Maribel Arroyave, Carlos Andrés Ramos-Paja, Edwin Moncada, Gabriel Esteban Narvaez Morales*
- **evenTra: Interpretable Anomaly Detection in Irregular Event-Based Time Series via Probabilistic Temporal Transition Modeling** *Ali Abbasi, Nelson Ricardo Rodrigues*
- **An Efficient Physics-Guided Learning Approach to Modeling Battery Degradation with Sparse Observations** *Yixin Nie, Zekai Yu, Fan Yang*
- **DC Arc-Fault Detection in PV Systems: A Practical Application of IEC 63027 with Extended Cable Lengths** *Gabryel gouveia de jesus souza, Pedro Follador, Filipe Ramos, José Neto, Lúcia Saito, Bruno Lima*
- **SST Testbed: An Experimental Platform of Attacks and Defenses for Networked Embedded Systems** *Carlos Beltran Quinonez, Dongha Kim, Hokeun Kim*

Thursday 5 March 2026

Room_C — Technical Session

Industrial Automation, Communication, and Manufacturing

Chairs: Hendrik Eisbein, Joschka Kersting

- **A Human-Centred Architecture Integrating Digital Twin and Agentic AI for Predictive Maintenance** *Leonardo Mendonca, Jose Barbosa, Paulo Leitao*
- **Wireless and Digital Driving Mode Switch System for the Next-Gen of Automotive Vehicles** *Lucas Pinow, Luis Piardi, Miguel Afonso Beckers, José Augusto Carvalho, Jorge Laranjeira, Paulo Leitao*
- **A Review of Maturity Models for Industry 4.0: From Assessment to Roadmap** *Zied Ben Cheikh, Flávia Pires, Joseane Pontes, Paulo Leitao*
- **Vendor-Aware Industrial Agents: RAG-Enhanced LLMs for Secure On-Premise PLC Code Generation** *Joschka Kersting, Gesa Benndorf, Michael Rummel*
- **Simulation-Based Evaluation of Fleet Management Strategies for Autonomous Mobile Robots in Warehouse Environments** *Joachim Schenk, Julian Ernst, Philipp Schaber, Timotheus Tauber*
- **Identification of production segments within circular productions** *Hendrik Eisbein, Gunther Schuh, Seth Schmitz*

10:15-10:30 — Coffee Corner — Coffee Break

Coffee Break

10:30-11:30 — Auditorium — Keynote

Inverter-Based Resource Impacts on Electric Power Systems

Inverter-Based Resource Impacts on Electric Power Systems

Prof. Hector Altuve Ferrer Dean of SEL University en Schweitzer Engineering Laboratories, Mexico

Abstract: I begin this presentation by describing the ongoing changes in electric power systems. I then introduce the inverter-based resources (IBRs) and explain the concept of inertia along with its influence on power system transient behavior. I compare electromechanical generators and IBRs to highlight key differences and explain system transient and frequency stability, and how increasing IBR penetration affects them. Next, I examine power system voltage stability and its sensitivity to high levels of IBR integration. I describe how fault contributions from IBRs differ from those of electromechanical generators, and finally, I address the impact of IBRs on power system protection and also present potential solutions to this challenge.

Keynote Speakers: Hector Altuve Ferrer

11:30-13:00 — Auditorium — Industry Forum

Industry Forum

Intelligent Autonomy in Industrial Systems: Engineering Digital Twin based Multi-agent systems from Testbed to Production-ready systems

Thursday 5 March 2026

Daniel R. Isaacs CTO and General Manager, Digital Twin Consortium (DTC) / Object Management Group (OMG), USA

Abstract: The convergence of digital twins, generative AI, and multi-agent systems enables unprecedented levels of autonomous reasoning in industrial operations. Drawing from the DTC's active testbed portfolio spanning manufacturing, energy, healthcare, and infrastructure, this plenary will showcase how organizations are developing and deploying Digital Twin based multi-agent systems. Attendees will learn capability-base methodologies that scale from pilot to production.

Innovation through New Product Development: Steel Industry Insights

Lucia Nares Candia Product Development Director, Ternium, Mexico

Abstract: Innovation matters because it's how we solve real problems faster and better. It keeps us competitive in a world that's constantly changing, and it transforms ideas into real value for people and industries. In the steel sector, innovation is driven by global megatrends such as clean energy, sustainability, and high performance demands. Through a structured development process, we turn complex challenges into stronger, lighter, and more efficient materials. By reviewing real cases from the steel industry, we see how precise chemistry, smart heat treatments, and rigorous validation enable breakthrough products. In short, innovation is what moves industries forward - and it's what turns creativity into real world impact.

Chairs: Michael Basin

Keynote Speakers: Daniel Isaacs, Lucia Nares Candia

13:00-14:00

Lunch Room — Lunch

Lunch

14:00-15:30

Auditorium — SYP

Meeting: Students and Young Professionals

Room_A — Technical Session

Electrical Machines, Drives, Sensors and Actuators Advanced Motion Control

Chairs: Julio Rodriguez, Michael Bierhoff

FEA-Based Evaluation of Fault Sensitivity in Spoke-Type and SPMSM Designs for Light EV *Fatemeh Ghalavand, Thirumarai Ilamparithi*

An Effective MTPA-Field Weakening Approach for Interior Permanent Magnet Synchronous Machines *Michael Bierhoff, Ahmed Mudassar*

Development of a practical 2D printing system for flexible nanosensors *Adley Bracho-Garduño, Darcy Gabrielle Torres-Salazar, Norma*

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Alicia García-Vidaña, Rocío Margarita Lopez-Torres, Rubén Guerrero-Rivera, JOSUE ORTIZ-MEDINA

Electromagnetic Simulation based Study of External Magnetic Field Sensitivity to Magnet Temperature in an Interior Permanent Magnet Machine *Claude Sandra KAMWO FOUDJIN, Andre Nasr, Fabrice MORGANTI, Jean NINET, Hugo QUINTENS*

Complex-valued model of permanent magnet synchronous motors considering spatial harmonics *Ludovica Luciano, Arnau Doria-Cerezo, Nicolò Salamone*

Purposive Sampling Method for Precise and Accurate Parameter Identification in Motor Drives *Yuichiro Yazaki, Akihiro Imura, Shinji Doki*

Room_B

Technical Session

Signals, Image Processing, and Computational Intelligence

Chairs: Daswin Silva, Oleg Sergiyenko

Stable Diffusion based Image Generation for Vision-Based Tool Condition Monitoring *Jakob Rothe, Biray Sutcuoglu, Raven Reisch, Thomas Runkler*

Quantized LLMs for Clinical Report and Question Answering in Retinal Disease Assessment *Andre Ivann Herrera Chavez, Wendy Flores-Fuentes, Eder Alejandro Rodriguez Martinez, Paolo Mercorelli, Julio Rodriguez, Oleg Sergiyenko*

Hybrid F 2 and ROS 2 Architecture for Vision-Based Autonomous Flight: Design and Experimental Validation *Abdelrahman Metwally, Monijesu James, Alexey Fedoseev, Miguel Cabrera, Dzmitry Tsetserukou, Andrey Somov*

Evaluation of Monocular Visual SLAM using a Consumer Camera *Kazuki Adachi, Wenzheng Zhang, Yoshitaka Hara, Sousuke Nakamura*

Semantic Segmentation based on Label Voting with Segment Anything Model *Kei Miyagawa, Yoshitaka Hara, Sousuke Nakamura*

Blockchain-based Provenance for Artificial Intelligence Lifecycle Traceability *Lakshitha Gunasekara, Daswin de Silva, Nishan Mills, Harsha Moraliyage, Andrew Jennings*

Room_C

Technical Session

Internet of Things, Cyber-Physical Systems, and Cybersecurity

Chairs: Anibal Calle-Zuniga, Tarmo Korõtko

Driving Circularity through Digital Product Passport: Current Status and Research Challenges *José Costa, Flávia Pires, Paulo Leitao*

Towards Efficient Blockchain-Integrated Smart Grids: Experimental Study with IoT Virtual Smart Meters *Anibal Calle-Zuniga, Washington Velásquez Vargas*

Automatic Instrumentation of PLC Programs for Anomaly Detection in Industrial Control Systems *OMAYMA ALLA, stephane mocanu*

Implementation of MITRE CRUC for Operational Resilience Assessment in Cyber-Physical Systems *Tarmo Korõtko, SHAYMAA KHALIL, Alvaró Schuller, Vahur Kotkas, Jaakob Lambot, Karl Pappel*

Temperature-Dependent Modeling of the Solid Electrolyte Interface Growth via a Physics-Based Equivalent Circuit Framework *Ziqi Wang, Mo-Yuen Chow*

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Objective Function Library and Adaptive Objective Selection for Resilient Microgrids in Disaster Relief *Zhiyu Long, Mo-Yuen Chow*

15:30-15:45

Coffee Corner — Coffee Break

Coffee Break

15:45-16:30

Room_C — Industry Forum

Industry Forum

Application of Data Analytics and IA for Product Quality in the Steel Industry

Ramiro Chapa Olivares Quality Plant Director, Ternium, Mexico

Abstract: Most Quality practices in the industry rely on visual inspection and manual measuring, but how are we applying data analytics and artificial intelligence to have a better process control and for better quality in our products? This talk will show you how we´re applying data analytics and machine learning by obtaining data from multiple equipment, understanding and preparing data for models that helps us detect, control and have a quick response in a production environment.

Chairs: Michael Basin

Keynote Speakers: Ramiro Chapa

15:45-17:15

Auditorium — SYP

Meeting: Student and Young Professionals

19:00-22:00

Gala Dinner — Gala Dinner

Gala Dinner

Friday 6 March 2026

08:30-10:30

Auditorium — Tutorial

Quantum-Resilient Security for Industrial 6G and Cyber-Physical Systems

Industrial Cyber-Physical Systems increasingly rely on advanced wireless connectivity, edge computing, and distributed control to support automation, robotics, and critical infrastructure. Emerging 6G networks are expected to play a central role in enabling these systems by providing ultra-reliable and low-latency communication across industrial environments. At the same time, advances in quantum computing pose a long-term threat to classical cryptographic mechanisms that currently protect industrial communication and control channels. Since industrial systems often have long operational lifetimes, addressing quantum security risks early is critical.

This tutorial focuses on quantum resilient security mechanisms for

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	industrial Cyber-Physical Systems, with emphasis on post-quantum cryptography and quantum-based key management. The tutorial introduces the fundamental security challenges posed by quantum adversaries and discusses how quantum-safe mechanisms can be integrated into industrial 6G and next-generation industrial communication architectures. A key focus is placed on practical deployment considerations, including computational overhead, memory usage, latency impact, and system reliability in resource-constrained industrial devices. The tutorial combines conceptual foundations with practical demonstrations and case studies using current user equipment platforms as realistic precursors to future industrial 6G devices. The goal is to provide attendees with actionable insight into designing secure and future-proof Industrial Cyber-Physical Systems in the post-quantum era. Chairs: Abdullah Aydeger, Engin Zeydan
10:30-10:45	Coffee Corner Coffee Break **Coffee Break**
10:45-11:45	Auditorium Keynote **Dynamic Event-Triggered Distributed Coordination Control** **Dynamic Event-Triggered Distributed Coordination Control** Prof. Qinglong Han Pro Vice-Chancellor and Distinguished Professor at Swinburne University of Technology, Australia Abstract: Distributed coordination control is the current trend in networked systems and finds prosperous applications across a variety of fields, such as smart grids and intelligent transportation systems. One fundamental issue in coordinating and controlling a large group of distributed and networked agents is the influence of intermittent inter-agent interactions caused by constrained communication resources. Event-triggered communication scheduling stands out as a promising enabler to strike a balance between the desired control performance and the satisfactory resource efficiency. What distinguishes dynamic event-triggered scheduling from traditional static event-triggered scheduling is that the triggering mechanism can be dynamically adjusted over time in accordance with both available system information and additional dynamic variables. This plenary lecture provides an up-to-date overview of dynamic event-triggered distributed coordination control. The motivation of dynamic event-triggered scheduling is first introduced in the context of distributed coordination control. Then, some techniques of dynamic event-triggered distributed coordination control are discussed in detail. Implementation and design issues are well addressed. Furthermore, this plenary lecture exemplifies two applications of dynamic event-triggered distributed coordination control in the fields of microgrids and automated vehicles. Several challenges are suggested to direct future research. Keynote Speakers: Qinglong Han
11:45-13:15	Auditorium Industry Forum **Industry Forum**

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Empowering Humanity: MicroMob and the Democratization of Sustainable Urban Transport

Ricardo Apaez CEO at DRIVEN, CLAUT Innovation Center, Mexico

Abstract: For over a century, the automotive industry has prioritized over-engineered, two-ton vehicles for short-distance trips, creating a stagnant status quo that ignores urban reality. This keynote introduces the “Mexico People’s Car,” a paradigm shift designed to dismantle these inefficient norms. By right-sizing technology and localized engineering, we are democratizing freedom of movement. Join us to explore how Micromob transforms mobility from a luxury burden into an accessible enabler of human progress.

Public Strategy for High-Impact Innovation: The Nuevo León Approach

José Alfredo Pérez Bernal General Director, Institute of Innovation and Technology Transfer of Nuevo León (I2T2), Mexico

Abstract: In an era defined by technological acceleration and industrial transformation, regional governments play a decisive role in shaping competitive innovation ecosystems. Nuevo León has positioned innovation as a central pillar of its economic development strategy, aligning public policy, industry strength, and scientific capacity to build a high-impact, globally connected ecosystem. From the Government of Nuevo León and through I2T2, targeted instruments have been launched to stimulate science-based entrepreneurship, particularly in nanotechnology and biotechnology—strategic sectors with strong industrial relevance. These calls are not isolated funding efforts, but part of a broader policy vision to consolidate advanced manufacturing, deep tech capabilities, and knowledge-intensive industries. This intervention will present how strategic public leadership, sector prioritization, and ecosystem coordination are enabling Nuevo León to strengthen its global positioning as a competitive innovation-driven region.

Chairs: René Alberto Villarreal Ramos

Keynote Speakers: José Alfredo Pérez Bernal, Ricardo Apaez

13:15-14:15

Lunch Room — Lunch

Lunch

14:15-15:45

Room_A — Technical Session

Power Electronics, Energy, and Computational Intelligence

Chairs: Kevin Cano-Pulido, Mia Mejia

Low-Cost Dual-IMU and Video System for Sit-to-Stand Analysis
Jesus Heriberto Orduño-Osuna, Wendy Flores-Fuentes, Fabian Murrieta, Julio

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Rodriguez, Gabriel Trujillo-Hernández, Kevin Fabian Rios-Alejo, Oleg Sergiyenko, Ivan Alba-Corpus, Paolo Mercorelli

Impact Assessment of EBs Charging Stations on the MV Distribution Network in Honduras *Mia Mejia, Osly Rodas, Miguel Figueroa*

Location, Location, Location: How Injection Site Placement Influences Hydrogen Injection Capacity in Gas Distribution Networks *Joachim Schenk, Christian Fiebig, Markus Erhart*

SAPF-Based Power Quality Enhancement for LEV Charging Loads in Off-Grid PV Systems *Kevin Cano-Pulido, Nancy Mondragón-Escamilla, Pedro-Enrique Velázquez-Elizondo, Marco-Antonio Hernández-Nochebuena, Teresa-Raquel Granados-Luna*

Towards Informed EV Purchases: Real-World Urban Driving and Energy Estimation in Mexico City *Delia Guadalupe Robles-Galeana, Cristian Martinez-Dominguez, Yoselin Rosas-Ordoñez, Kevin Cano-Pulido, Lizbeth Soto-Jimenez, Marco-Antonio Hernández-Nochebuena*

Impact of Inverter Nonlinear Effects on Observer-Based Flux Estimation for SynRel Machines *Samar ALHAJ HASSAN, Romain DELPOUX, Vincent LECHAPPE, Thomas Huguet, Xavier BRUN*

Room_B — Technical Session

Electronic Systems-on-Chip, Industrial Automation and Manufacturing

Chairs: JOSUE ORTIZ-MEDINA, Leandro Becker

Axiomatic Design for Discrete Process Automation *Aydin Homay, Mario de Sousa*

Partial Order Reduction via Areal Partitioning for Modeling Truck Logistics by the Ambient Calculus *Toru Kato*

Orchestrating Distributed Simulations for Circular Manufacturing-as-a-Service Ecosystems *Milan Vathoopan Kannan, Prasad Talasila, Jalil Boudjadar, Chresten By Larsen, Nicola Bicocchi, Marco Picone, Marco Melloni*

Optimization of conductive SWCNT-based nanocomposites for printing flexible electronics *Darcy Gabrielle Torres-Salazar, Adley Bracho-Garduño, Adriana Robledo-Peralta, Ignacio Villanueva-Fierro, José Antonio Martínez-Rivera, Francisco Javier Godínez-García, JOSUE ORTIZ-MEDINA*

Applying Runtime Verification in the Control System of a VTOL UAV *Rafael Ramildes Ferreira, Leandro Becker*

A low-latency, lightweight EtherBone core for data communication in synchronized sensor networks *Unai Sainz-Estebanez, Alejandro Arteaga-Perez, Armando Astarloa, Koldo Basterretxea*

Room_C — Technical Session

Control Systems, Robotics and Mechatronics

Chairs: Joachim Schenk, Valentin Leipe

Compliant Load-Sensing Frame for Integrated Weight Monitoring in Autonomous Mobile Robots *Joachim Schenk, Philipp Schaber, Timotheus Tauber, Julian Ernst*

Model Predictive Position Control for Electrically Preloaded Rack-and-Pinion Drives *Valentin Leipe, Lukas Steinle, Philipp Krause, Armin Lechler, Alexander Verl*

Multimodal biceps brachii contractions data acquisition during exercise using Surface Electromyography and Transversal

Friday 6 March 2026

	Electrical Impedance Myography based on AD8302 Chip-Demodulation: a preliminary study *Oscar Celedon, José Antonio Gutiérrez, Marcos Gutiérrez, Irán Melchor, Enrique Reyes* **Gradient-guided Prediction of High Manipulability Configurations for Potential Field Surface-following Path Planning** *Ryuji Nakagawa, Hiroki Kimura, Ryosuke Tasaki* **Symgait: Experimental Development of a Transtibial Prosthesis for Symmetrical Gait** *Ricardo E. Garcia, Carlo Leonardo Jara Viveros, Hector Emmanuel Gonzalez Tortolero, Iker Salvador Sandoval Nungaray* **Optimal Torque Distribution based Motion Planning for Redundant Manipulators Using an Integrated MVN-RMP-MFE Approach** *Qiguang Chen, Ya-Jun Pan*
15:45-16:00	Auditorium Keynote **Conference Closing**