جامعة عبد المالك السعدي
Université Abdelmalek Essaâdi

FACULTE DES SCIENCES ET TECHNIQUES - AL HOCEIMA
كلية العلوم والتقنيات - الحسيمة

ENSA KHOURIBGA ÉCOLE NATIONALE DES SCIENCES APPLIQUÉES

جامعة السلطان مولاي سليمان
Université Sultan Moulay Slimane

INTERNATIONAL CONFERENCE ON ELECTRICAL SYSTEMS & AUTOMATION

W W W . I C E S A . M A

May 29-30, 2023

Faculty of Sciences and Techniques of Al Hoceima

AQUALAB

ADAR TANGER-TETOUAN-AL HOCEIMA

Centre National pour la Recherche Scientifique et Technique

Royaume du Maroc

Académie Hassan II des Sciences et Techniques

ensi ÉCOLE DES NOUVELLES SCIENCES & INGÉNIERIE

CONTENT

Welcome Message

On behalf of the Organizing Committee, we would like to extend a warm welcome to all the participants of the International Conference on Electrical Systems & Automation (ICESA'23) held on May 29-30, 2023 in Al Hoceima, Morocco.

This scientific event organized by Abdelmalek Essaâdi University and Faculty of Sciences and Technology, Al Hoceima will provide a remarkable opportunity for academic and industrial communities to address new challenges, share their experiences and discuss future research directions in the field of renewable energies and electrical systems. The technical program will include plenary and regular technical sessions in hybrid mode.

There were 140 paper submissions from 12 countries. Each submission was reviewed by at least three chairs or PC members. We accepted 74 regular papers (52%). Unfortunately, due to limitations of conference topics and edited volumes, the Program Committee was forced to reject some interesting papers, which did not satisfy these topics or publisher requirements.

All accepted papers after the peer-review process, will be published as chapters in the Book Series “Advances in Science, Technology and Innovation” (ASTI) by Springer, indexed by Scopus.

The ICESA'23 is honored this year to have the following distinguished keynotes speakers: Pr. Ahmed RUBAAI (Howard University, Washington, USA), Pr. Amin BENNOUNA (Cady Ayyad University, Morocco), Pr. Houcine CHAFOUK (University of Rouen Normandy, France), Pr. Alfredo VACCARO (University of Sannio, Benevento, Italy).

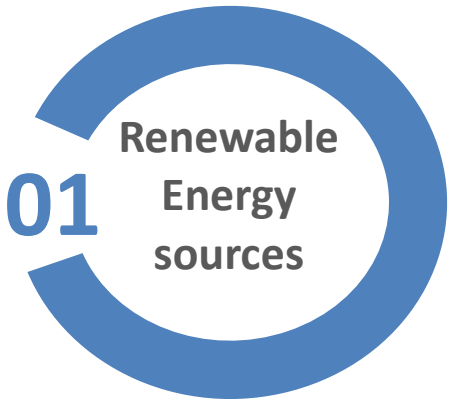
We would like to thank all members of different committees for their efforts before and during the conference and all members of the Technical Program Committee for their hard work in providing reviews in a timely manner. Special thanks also go to all authors for their valuable contributions since ICESA'23 would not be possible without their contributions.

We are also grateful to all our partners and sponsors, especially Abdelmalek Essaâdi University and the Faculty of Sciences and Technology, Al-Hoceima, the CNRST center and National School of Applied Sciences of Khouribga.

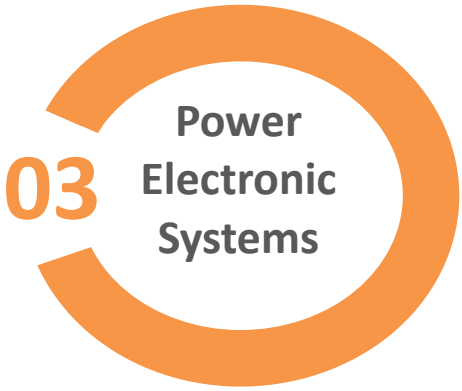
We hope you enjoy your time with us and we look forward to meeting you all in the next edition of the ICESA conference.

ICESA'23 Organizing Committee

CONFERENCE PROGRAM

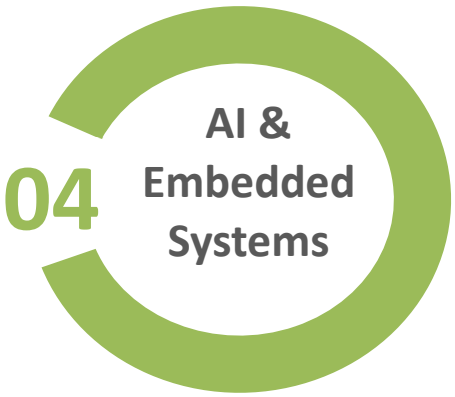


Solar energy systems
Wind energy Systems
Smart grid
AC micro-grids & DC micro-grids
Energy Efficient in Building Design and management



Power converters
Electrical Machines
Energy conversion
All types of converters
Active filters

Modeling and identification
Linear and nonlinear control
Discrete Event systems
Predictive and robust control
Optimization



Artificial Intelligence
Micro-Electronics
Antennas and propagation
Embedded systems
Intelligent sensors & sensor Networks

CONFERENCE PROGRAM

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Webinar link : (ID: 343 167 435 356 | Code: 862Jgj)</td></tr>
<tr><td>9h00-10h00
(UTC+1)</td><td colspan="6">• Pr. EL MOUMNI Bouchta, President of Abdelmalek Essaâdi University
• Pr. BAKKALI Mohammed, Dean of the Faculty of Sciences and Technology, Al-Hoceima
• Pr. SAJIEDDINE Mohammed, Director of ENSA, Khouribga
• Pr. BENDAOUD Mohamed, General Chair of ICESA’23
• Pr. EL FATHI Amine, Local General Chair of ICESA’23</td></tr>
<tr><td colspan="7">PLENARY SESSION
Webinar link : (ID: 343 167 435 356 | Code: 862Jgj)</td></tr>
<tr><td>10h00-11h00
(UTC+1)</td><td colspan="6">KN11: Development and Implementation of Fuzzy-Neural-Network Structure-Based Self-learning Controls of Industrial Drives
Pr. Ahmed RUBAAI
Moderator: DIB Faiza</td></tr>
<tr><td colspan="7">Coffee Break</td></tr>
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Webinar link : (ID: 343 167 435 356 | Code: 862Jgj)</td></tr>
<tr><td>11h30-12h30
(UTC+1)</td><td colspan="6">KN12: Combined impact of slower economic growth and self-production on the moderation of electricity demand growth in Morocco
Pr. Amin Bennouna
Moderator: Pr Ismail ER RACHID</td></tr>
<tr><td colspan="7">Lunch</td></tr>
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(UTC+1)</td><td colspan="6">Parallel Sessions</td></tr>
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Room:B4</td><td>Oral Session 1.2
room: C4</td><td>Oral Session 4.1
room: P4</td><td>Oral Session 2.2
Google Meet Link</td><td>Oral Session 3.2
Google Meet Link</td><td>Oral Special Session SS2
room: G4</td></tr>
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<tr><td colspan="7">TUESDAY MAY 30, 2023</td></tr>
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<tr><td>09h30-10h30
(UTC+1)</td><td colspan="6">KN21: Diagnosis and Fault Tolerant Control for the Wind Turbine
Pr. Houcine CHAFOUK
Moderator : Pr. Kadija EL ANOUZ</td></tr>
<tr><td colspan="7">Coffee Break</td></tr>
<tr><td colspan="7">PLENARY SESSION
Webinar link : (ID: 343 167 435 356 | Code: 862Jgj)</td></tr>
<tr><td>11h00-12h00
(UTC+1)</td><td colspan="6">KN22: Decentralized Smart Grids Operation by Self-Organizing Dynamic Agents
Pr. Alfredo VACCARO
Moderator : Pr. Mohamed FAHIM</td></tr>
<tr><td colspan="7">Lunch</td></tr>
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(UTC+1)</td><td colspan="6">Parallel Sessions</td></tr>
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room: C1</td><td colspan="2">Oral Session 1.3
Google Meet Link</td><td>Oral Session 4.2
Google Meet Link</td><td>Oral Special Session SS1:
Google Meet Link</td></tr>
<tr><td colspan="7">CLOSING CEREMONY</td></tr>
<tr><td colspan="7">Coffee Break</td></tr>
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TOPIC 1: RENEWABLE ENERGY SOURCES

- **PARALLEL SESSION 1.1**

Session Chairs: CHIKH & ER RACHID		**Date: 29 May 2023** **15h00 - 17h00**
Paper ID	**Room: B4**	
82	**RAHMOUNI,** YOUSFI, BACHIRI and BAKHOUYA	Sizing and Simulation of an Alternative Microgrid System
87	**EL MOUSSATI** AND HAMDI	Energy harvesting using coupled aero-electromagnetic 2DOF mechanical system
104	**MBODJI,** DIOUF, PIRIOU AND MAIGA	Combustion characteristics of biomass pellet fuels in a fixed-bed micro-gasifier cook stove in Senegal
106	**MESSAOUDI,** DAHBI, MESSAOUDI, YAHYAOUI, BLAACHA AND AZIZ	Production of hydrogen by photovoltaic mean using seawater
126	**LAMKADDEM,** EL MOUSSAOUI, MALEK, DEBLECKER, KASSMI, and BACHIRI	Simulation of the Operation of a Photovoltaic Cooker System (1.2 kW) with Energy Storage in Solar Batteries
129	**NCIR,** EL AKCHIOUI and EL FATHI	Enhancing Photovoltaic System Modeling and Control under Partial and Complex Shading Conditions using a Robust Hybrid DE-FFNN MPPT Strategy
131	**YAYHAOUI,** AZIZ, A. MESSAOUDI, BLAACHA, DAHBI, I. MESSAOUDI	Hydrogen production by water electrolysis in an optimized photovoltaic conversion chain

- **PARALLEL SESSION 1.2**

Session Chairs: M. FAHIM, B. BENAMROU and H. HIHI		**Date: 29 May 2023** **15h00 - 17h00**
Paper ID	**Room: C4**	
47	**EL FEZAZI**, EL FEZAZI, EL AKCHIOUI, EL FATHI, TISSIR, and IDRISSI	Improved approach to stabilize discrete-time delayed systems: controller for wind tunnels
29	**BENBRAHIM,** BENABBOU, DAGDOUGUI, BOUZEKRI, BERRADO and BELHAJ	Deep Learning Approach for Solar Irradiance Forecasting: A Moroccan case study
31	**ABOUSAID,** BENABBOU, DAGDOUGUI, BOUZEKRI, BERRADO and BELHAJ	PV Power Forecasting Using Deep Learning and Physical Models: Case study of Morocco
86	**BOUAFIA,** EL FATHI, BENDAOUD, EL-HAMMOUCHI and EL AKCHIOUI	Sizing Renewable Energy by Using Genetic Algorithm
88	**EL-QASERY,** ABBOU and ID-KHAJINE	Grid-tied Energy Management System for hybrid microgrid using advanced-PSO algorithm
121	**AGOUZOUL,** OUKENNOU, ELMARIAMI, BOUKHEROUAA, GADAL and TARRAQ	A comparative study of metaheuristics algorithms applied for optimal reactive power dispatch problem considering load uncertainty
16	**SEBBANE,** EL AKCHIOUI and FAHIM	Intelligent PV Fault Detection and Categorization Based on Metaheuristic Algorithm and Feedforward Neural Network

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- **PARALLEL SESSION 1.3**

Session Chairs: S. ZKHNINI, O. EL ABOUTI, and I. EL OUADI		**Date: 30 May 2023** **15h00 - 17h00**
Paper ID	**Meeting link:** https://meet.google.com/dsf-vfnr-ehi	
8	**ELHAMMOUDY,** ELYAQOUTI, ARJDAL, BEN HMAMOU, LIDAIGHBI, SAADAOUI, and CHOULLI	PV Modelling and Extracting the Single-Diode Model Parameters: A Review Study on Analytical and Numerical Methods
48	**KHRISSI,** TILIOUA, MOUSSAOUI, KHRISSI, and LIFI	Acoustic assessment of a composite material based on plaster and date palm spathes
64	**EL BOUJI,** KAMIL and BEIDOURI	A numerical evaluation of the energy potential of waves along Morocco's Atlantic and Mediterranean coasts
85	**ANIGROU,** ZOUINI, EL KHLIFI	Feasibility study of the design of a floor heating system for the wet rooms of a Hammam using solar photovoltaic
105	**EL MARZOUGUI,** BAHSINE, CHIHAB, AIT NOUH and OUKENNOU	Micro-grid design and optimzation using COOT optimization algorithm
113	**OUMACHTAQ,** HALIMI, MESSAOUDI and EL HASSOUANI	Numerical analysis of a parabolic trough collector absorber with a Two-Straight-Tubes Exchanger
118	**HALIMI,** OUMACHTAQ, ELAMRANI, AMRANI, LAMRANI ALAOUI and MESSAOUDI	Long-Term Investigation of Hybrid System for Building Integration: PTC-Based Heating system and Power Generation (CPV/T)
128	**BENBBA,** AKHSASSI, AIT SI AHMED, EL MOUDEN, WIFAYA and OUTZOURHIT	Assessment of Bifacial Modules in an AgriVoltaic System installed in Agadir, Morocco

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TOPIC 2: CONTROL SYSTEMS & AUTOMATION

PARALLEL SESSION 2.1

Session Chairs: N. EL AKCHIOUI, M. SEDDIK and M. HAMDI		**Date: 30 May 2023** **15h00 - 17h00**
Paper ID	**Room: B4**	
6	**JEBRANE and** EL AKCHIOUI	Toward Intelligent Navigation for Autonomous Mobile Robots: Learning from the classics
32	**ISSAM,** LAMZOURI, EL AMRANI and BOUFOUNAS	Integral SMC Strategy for MPPT of the Solar PV System under Varying Climatic Conditions.
37	**AKKADER,** BOUYGHF and BAGHDAD	Compact Design of SIW Resonator using Differential Evolution Algorithm
50	**MORADI,** TAHIRI, OUAFI and CHIKH	Modeling and control of a standalone PMSG wind generation system to extract the maximum power based on direct power control
53	**LAKHAL,** FATIMA ZAHRA, AIT EL KADI and BENCHAGRA	The efficiency of fuzzy logic control on the power stabilization of wind turbine
68	**EL-MOUMEN,** EL AKCHIOUI and HASSANI ZERROUK	Continuous Approximation of Stochastic Petri Nets: Adaptive maximal firing speeds
90	**SAADOUNI,** SAMOUDI, BENDAOU and HANAFI	Maximizing Performance of Light Emitting Diode Luminaires for Road Illumination

PARALLEL SESSION 2.2

Session Chairs: A. MESSAOUDI & A. AZIZ		**Date: 29 May 2023** **15h00 - 17h00**
Paper ID	**Meeting link:** https://meet.google.com/gdz-squj-uzv	
30	**BOUASRIA,** JEBRANE and EL AKCHIOUI	Self-Driving Cars Perception Pedestrian Detection
20	**ET-TAIBI**, ABID, BOUFOUNAS, BOURHNANE and BENHADDOU	Machine Learning for Cloud and IoT-based Smart Agriculture
67	**HAMZA**, ABOUZAHIR and RAMZI	An outdoor navigation system dedicated to a Moroccan micro-tractor based on SLAM algorithms and multisensor fusion.
71	**YOUSSFI,** HAKAM and AIT EL KADI	Comparative Study of Proportional–Integral, Fuzzy Logic and Neural Fuzzy logic Controllers for Boost converter
80	**MIMI,** BEN MAISSA and TAMTAOUI	A control strategy for energy cost reduction, peak shaving and power factor correction using batteries
99	**ET-TALEBY,** CHAIBI, EL KARI, CHALH and BENSLIMANE	Detection and Classification of Faults in PV Systems Based on Thermal Imaging and Fuzzy Logic Algorithm
107	**TALBI**, EL MOUDDEN, BAIJOU and ABAALI	Robust Deterministic Optimization Approach for Optimal Reactive Energy Management in Electrical Transmission Network
120	**EL IDRISSI**, EL-BOUZAIDI and ABDOUN	Health Care Intelligent System: Deep Residual Network Powered by Data Augmentation for automatic Melanoma Image Classification

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TOPIC 3: POWER ELECTRONICS

PARALLEL SESSION 3.1

Session Chairs: Z. BOULGHASSOUL, N. BENAYA & A. SOUFI		Date: 30 May 2023 15h00 - 17h00
Paper ID	**Room: C4**	
35	**ARRACH,** CHIKH and LOKRITI	Design and analysis performances of a 3.6 kW three-phase charger with low harmonic distortion for urban cars
73	**EL HOURE,** YOUSFI and CHAKER	Evaluation of Charging Protocols for Lithium-ion Batteries Using Battery Equivalent Circuit Model
77	**ZALLOUGH,** DIB, BEN MEZIANE and BENAYA	The Impact of Fitness Functions for Optimal Tuning of PID Controller Applied to DC Motor
115	**LATIFI,** OUACHTOUK, ABOUDRAR and ZEGRARI	A comparative study of the ADRC and PI controller of a wind turbine driven by a PMSG
119	**DAGHOURI** and EL HANI	Assessing MPPT Techniques for Nanosatellite EPS in Sun-Pointing Orientation: A comparative Study
130	**BLAACHA**, AZIZ, ABOUTNI, MESSAOUDI, DAHBI, YAHYAOUI, EL FATHI, CHENNAIF, MAAOUANE and BOURHALEB	Injection of Photovoltaic Power into the utility grid through a modified 5 Level transformerless H-bridge Inverter
132	**H. CHADLI**, SALMI, S. CHADLI, MALEK, DEBLECKER, KASSMI and BACHIRI	Feasibility of a power and control system for an autonomous photovoltaic hot plate type cooker (600 Wp)

PARALLEL SESSION 3.2

Session Chairs: D. FAIZA & K. BEN MEZIANE		Date: 29 May 2023 15h00 - 17h00
Paper ID	**Meeting link: https://meet.google.com/qea-vuvk-izu**	
25	**RIBEIRO,** CARVALHO, DA SILVA, LIMA, PRYM, BARROS, MARQUES and VILLALVA	The Influence of PVTf on Machine Learning Estimation of IGBT Junction Temperature
38	**FOUAD,** BENKIRANE, KHAFALLAH and AZIZ	Improved Direct Torque Control of Dual Three Phase Permanent Magnet Synchronous Motor
51	**SARIH**, BOULGHASOUL, CHAABA, ELBACHA and TAJER	Performing ANN fault tolerant control based Dynamic Voltage Restorer over a PV tied microgrid in accordance with the new Moroccan Grid Code requirements
69	**FAHMANI,** BENHADOU and MEDROMI	Unmanned Aerial Vehicle Path Planning Algorithms for Very High Voltage Transmission Lines Inspection
75	**JOUAHRI,** BOULGHASOUL and TAJER	Intelligent control of electrical energy in a public lighting system by fuzzy logic method
81	**EL MOURABIT,** AKAABOUNE, OULAAROSS and BENCHAGRA	Study and implementation of a single-phase H-bridge inverter and development of the MOSFET gate driver
110	**OULAAROSS,** AKAABOUNE, EL MOURABIT, LAKHAL and BENCHAGRA	Study and realization of a single-phase solar inverter with harmonics rejection
114	**FADLAOUI** and MASAIF	State-of-charge estimation of a lithium-ion battery in an electric vehicle using the XGBoost method

CONFERENCE PROGRAM

TOPIC 4: ELECTRONICS & EMBEDDED SYSTEMS

PARALLEL SESSION 4.1

Session Chairs: A. KAABAL, AMHARECH and N. EL BARBRI		**Date: 29 May 2023** **15h00 - 17h00**
Paper ID	**Room: P4**	
74	**EL MAIMOUNI,** AHYOUD and KAABAL	Mechanical Reconfiguration of Circular Patch Antenna using Metasurface for 5G Wireless Communication
65	**ALI AMKOR** and EL BARBRI	An electronic tool to differentiate between potatoes according to fertilization methods
117	**SRATA,** KAABAL and HAMDI	Review: Limitations of ADAS Hardware and the Contribution of IoT and 5G
46	**EL FEZAZI,** EL FEZAZI, EL AKHCIOUI, EL FATHI, ALVAREZ, TISSIR and IDRISSI	Multiclass AQM on TCP/IP routers: Modeling, analysis, and design

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Session Chairs: M. EL GHABZOURI, R. ROCHDI and A. AMAHMOUJ		**Date: 30 May 2023** **15h00 - 17h00**
Paper ID	**Meeting link: https://meet.google.com/tam-spgg-fzv**	
4	**JENKAL,** EL FERDAOUSSI, SEBBAR, LAABOUBI, and LATIF	GPU-OpenCL accelerated ECG signal filtering process
13	**EL HASSANI** and SAADI	Design and analysis of antenna arrays operating at microwave frequencies for biomedical applications
66	**AMEZIANE,** ZARED, AKHMAL and QJIDAA	Design and Optimization of a Sub-Threshold CMOS LDO Regulator with Improved Performance for IoT and Wearable Devices
93	**AMEZIANE**, ZARED, AKHMAL and QJIDAA	Temperature-Compensated and Robust Bandgap Reference Voltage Circuit for High-Precision Sensors and Voltage regulators
108	**BOUYAHROUZI,** EL KIHEL, EMBARKI and EL KIHEL	Intelligent Bearing Fault Diagnosis using Artificial Neural Networks and IoT for Maintenance 4.0 Implementation
125	**AL RIMI,** ZUGARI, ABOUHSSOUS and ALTALQI	Wearable Textile Antenna for Mobile Health and Telemedicine Systems
127	**Taybi,** Assahsah, Karkril, Moutaouekkil, Elmagroud, and Ziyyat	Evaluation of the Exposition to ElectroMagnetics Field at 5G and 6G Frequencies

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Special Session SS1: Renewable energy and the important role of power converters

Session Chairs: F. BAKHSH, A. SALMAN FURKAN AND A. IQBAL		Date: 29 May 2023 15h00 - 17h00
Paper ID	**Meeting link: https://meet.google.com/ggx-ybvv-jqt**	
45	**AHESSAB,** HAKAM, GAGA and EL HADADI	Design and simulation of an intelligent grid connected MPPT inverter with battery storage using ANN algorithm
54	**OUKENNOU,** SANDALI, GADAL and AGOUZOUL	An Investigation of Overall Indices' Sensitivity in Detecting Voltage Collapse Proximity in Power Systems
78	**AKAABOUNE,** EL MOURABIT, OULAAROSS and BENCHAGRA	A new SPWM approach for high-performance single-phase half-bridge inverters with pure sine wave
83	**GAUTAM**, JALIL, BAKHSH, KHATOON	A Comparative Study of Various SuDoKu Algorithms for Improvement of Generated Power under Partial Shading Conditions
98	**CHAIBI**, ET-TALEBY, ELKARI, CHALH, BENSLIMANE	An experimental assessment of the single and double-diode models: possibility of a hybrid approach
109	**AMIR**, SHAHRUKH, BAKHSH	Design of Switched Capacitor Based Interfacing Circuit for Lossy Capacitive Sensor in Power System Monitoring

Special Session SS2: Intelligent control for complex autonomous vehicles

Session Chairs : E. MELLOULI, Y. EL AFOU & Y. BALBOUL		Date: 29 May 2023 15h00 - 17h00
Paper ID	**Room: G4**	
43	**HAKAM,** GAGA, EL HADADI, AHESSAB	OFF-Board Electric Vehicle Charger V2G and G2V based on PID controller
102	**ELABBASSI,**KHALA, EL YANBOIY, ELOUTASSI, EL HASSOUANI and MESSAOUDI	Management of battery-hydrogen tank storage system of electric vehicle energy using machine learning classification methods: Comparative Study
SS2.2	**JENNAN** and MELLOULI	Direct Fuzzy Logic controller Based on Sliding Mode for an Anti-Lock Braking System
SS2.3	**EL BOUASSI,** CHALH and MELLOULI	Optimizing Wind Turbine Control with Sliding Mode and Time delay Strategies
SS2.6	**ZAHID** and LAGRAT	Numerical Simulation of Flow in an Axial Turbojet Engine for Avionics System Design
SS2.5	**EL KASSMI,** EL AFOU and MELLOULI	Time-delay Sliding Mode Control of the Active Suspension System
SS2.1	**HMIDANI,** El AKCHIOUI, EL AFOU and MELLOULI	Comparative study of sliding mode control techniques for nonlinear active vehicle suspension system under external disturbances
SS2.4	**MOUSSA ABDILLAH,** EL AKCHIOUI and MELLOULI	A New Sliding Mode Control Based on Neural Networks for a Single-Rotor Helicopter

GUIDELINES FOR PRESENTATIONS

1. **Oral presentations for the ICESA may not exceed 15 minutes, plus 5 minutes given to Q/A.**
2. **All presentations are in English.**
3. **Arrive 10 minutes before the session start time to prepare your power point presentation.**
4. **Please, start and end your presentation on time and keep the time schedule.**
5. **Bring your presentation in MS-PowerPoint or PDF formats.**
6. **We will use the Google Meet platform for online presentations.**

CONFERENCE CHAIRS

KN11: Development and Implementation of Fuzzy-Neural-Network Structure-Based Self-learning Controls of Industrial Drives

Pr. Ahmed RUBAAI
Howard University
Washington, USA

Pr. AHMED RUBAAI, received the M.S.E.E degree from Case Western Reserve University, Cleveland, OH, and the Dr. Eng. degree from Cleveland State University, Cleveland, OH, in 1983 and 1988, respectively. In 1988, he joined Howard University, Washington, DC, as a faculty member, where he is presently a Professor and Chairperson of the Electrical Engineering and Computer Science Department. Dr. Rubaai has been named an IEEE Fellow in 2015.

As an Educator, Dr. Rubaai has been an acknowledged educator and leader of curriculum development at Howard University for more than two decades. He is the Founder and Lead Developer of Motion Control and Drives Laboratory that provides engineering students with valuable hands-on and "real-world" experiences." In recognition of his scholarly work and dedication to the improvement of engineering education, his work is recognized by the larger community of engineering educators, as verified by his receipt of the 2011 ASEE Robert G. Quinn Award and the Distinguished Educator Award of the Middle-Atlantic Section of the American Society for Engineering Education. This recognition is a clear demonstration and confirmation of his peers' high regard for his contributions to engineering education.

As a researcher, Dr. Rubaai has made significant contributions to the development and control of electric motor drives for industrial system applications in a variety of roles including scientist, research engineer, university professor, and as IEEE volunteer and leader. Most of these contributions are heavily oriented towards industrial applications that IEEE serves. Of importance is his development of control technologies by way of intelligence; laying the technological foundations for the production versions of high-performance drives used in an expansive array of industrial, commercial, and transportation applications today. His work covers a broad range of manufacturing and product applications and exemplifies his ability to bridge between academic research and the application to industrial applications. The bridges that Dr. Rubaai has built between industry and academia represent a uniquely valuable contribution that can be matched by very few others in the academic world today.

CONFERENCE CHAIRS

KN12: Combined impact of slower economic growth and self-production on the moderation of electricity demand growth in Morocco

Pr. Amin BENNOUNA

Cady Ayyad University,

Morocco

Prof. Amin BENNOUNA, retired after having taught Physics from 1980 to 2022. He won a National Research Prize Distinction in 2009, led two energy companies (to 2005 and 2018) and held several positions in the Moroccan Solar Industry Association until 2016. Now he coordinates a network of 250 Moroccan energy researchers after having led a solar energy research project with all Moroccan universities and two 'Medcampus' European Projects. After having built an energy scenario (2007) for Morocco'2030 and written more than 250 publications, he is now updating his "Monograph of energy in Morocco" (2011).

KN21: Diagnosis and Fault Tolerant Control for the Wind Turbine

Pr. Houcine CHAFOUK

University of Rouen Normandy,
France

Prof. Houcine Chafouk, IEEE member, is professor at ESIGELEC and Researcher at IRSEEM / University of Rouen Normandy, France, obtained a doctorate in automation at the University of Nancy, Lorraine, France in 1990, then he joined the same year the engineering school ESIGELEC, Rouen. From 2000 to 2008, he held the position of director of research and head of the research team in automation and systems. Since 2000, he has supervised around thirty doctoral, post-doctoral and HDR students who have carried out their research within IRSEEM or with international partners. He also participated in thesis juries as rapporteur (20 theses) and examiner (15 theses). Author and co-author of more than 200 research articles (publications and communications) in the fields of advanced control systems, diagnostics and fault tolerant control applied to the fields of renewable energy, automotive and aerospace.

CONFERENCE CHAIRS

KN22: Decentralized Smart Grids Operation by Self-Organizing Dynamic Agents

Pr. Alfredo VACCARO

University of Sannio, Benevento, Italy

Prof. Alfredo Vaccaro received the M.Sc. (Hons.) degree in electronic engineering from the University of Salerno, Salerno, Italy, and the Ph.D. degree in electrical and computer engineering from the University of Waterloo, Waterloo, ON, Canada. From 1999 to 2002, he was an

Assistant Researcher with the Department of Electrical and Electronic Engineering, University of Salerno. On March 2002 he joined the Department of Engineering, University of Sannio, Benevento, Italy, where he is currently a Full Professor of electrical power system. His research interests include interval-based methods for uncertain power system analysis, reliable computing techniques for robust power system optimization, and self-organizing architectures for decentralized smart grids computing.

Prof. Vaccaro is Editor in Chief of the -Smart Grids and Sustainable Energy- Ed. Springer Nature, and Associate Editor of the IEEE trans. on Power Systems, IEEE trans. on Smart Grids. He is the vice-Chair of the IEEE Power System Operation, Planning and Economics – Technologies & Innovations Subcommittee.

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