The First National Conference on Renewable Energies and Advanced Electrical Engineering (NC REAEE'25)

May 06-07ᵗʰ, 2025

University of M'Sila

Faculty of Technology

Electrical Engineering Laboratory (LGE)

CERTIFICATE Of PARTICIPATION

This Certificate is Awarded to:

RAHAL Mohamed Ilyas

for presenting (**online**) a paper entitled: **IoT-Driven Automatic Bottle Filling and Capping System Using Arduino**

Authors: **Mohamed Ilyas Rahal, Bendjama Oualid, Boukhemla Ahmed, Mourad Naidji, Adel Makhbouche, Zine Eddine Meguetta**

at the First National Conference on Renewable Energies and Advanced Electrical Engineering (NC-REAEE'25), held at M'Sila University- Algeria, on May 6–7ᵗʰ 2025.

Paper ID: **25**

Conference Chair

Dr. Abderrahim ZEMMIT

IoT-Driven Automatic Bottle Filling and Capping System Using Arduino

1th Mohamed Ilyas Rahal
dept. of Electronics, LASA laboratory
Badji Mokhtar-Annaba University
Annaba, Algeria
mohamed-ilyas.rahal@univ-annaba.dz

2nd Bendjama Oualid
dept. of Electronics
Badji Mokhtar-Annaba University
Annaba, Algeria
bendjamaoualid4@gmail.com

3th Boukhemla Ahmed
dept. of Electronics
Badji Mokhtar-Annaba University
Annaba, Algeria
bendjamaoualid4@gmail.com

4th Mourad Naidji
dept. of Electrotechnics
Badji Mokhtar-Annaba University
Annaba, Algeria
mourad.naidji@univ-annaba.dz

5th Adel Makhbouche
dept. of Electronics and Telecommunications
Université 8 Mai 1945 Guelma
line 4: Guelma, Algeria
makhbouche.adel@univ-guelma.dz

6th Zine Eddine Meguetta
Advanced Automation Research
Laboratory of Guelma
Higher Campus of the Lille)
Lille, France
z.meguetta@gmail.com

Abstract— **The fundamental objective of an automatic bottle filling system is to optimize production by minimizing or eliminating the need for human intervention. The key focus areas include ensuring filling accuracy, reducing errors, increasing productivity, and potentially lowering labor costs. By integrating technologies such as IoT and microcontrollers like Arduino, these systems enable remote monitoring and simplified management, contributing to the overall optimization of the filling process.**

A concrete example of this approach is illustrated in this paper, which focuses on an IoT- and Arduino-based system dedicated to automatic bottle filling and capping. The aim is to simplify business access to such processes, particularly in the manufacturing of carbonated beverages and pharmaceuticals. This paper implements various components, including the Arduino microcontroller, infrared transmitters and receivers, relay drivers, DC motors, and specialized mechanical devices, utilizing infrared detection to guide the process.

Remote monitoring via IoT ensures efficient management, reduces labor dependency, and optimizes the entire process.

Keywords—Automatic bottle filling, IoT, Arduino, remote monitoring, industrial automation, infrared detection, relay drivers, DC motors, capping system, manufacturing optimization.

I. INTRODUCTION

Automation systems are essential in modern industries, improving efficiency, precision, and scalability across various applications. These systems rely on controllers such as Programmable Logic Controllers (PLCs) and microcontrollers to manage operations with minimal human intervention. PLCs are widely used in industrial automation due to their robustness, reliability, and ability to handle complex control processes. They feature multiple input/output (I/O) ports, built-in communication protocols, and real-time processing capabilities, making them ideal for large-scale manufacturing, power plants, and process industries. However, PLCs can be expensive, especially for small and medium enterprises (SMEs), limiting their adoption in cost-sensitive applications. Microcontrollers, on the other hand, offer a more affordable and flexible alternative for automation. These compact, integrated circuits contain a processor, memory, and I/O interfaces, enabling them to control a wide range of electronic devices. Microcontrollers, such as those used in Arduino boards, are commonly employed in embedded systems for tasks like sensor integration, motor control, and data processing. Their affordability and ease of programming make them ideal for small-scale automation projects in fields such as home automation, robotics, and medical devices. Both PLCs and microcontrollers play a crucial role in automation, with the choice depending on factors such as complexity, cost, and scalability. As industries continue to adopt automation, the integration of IoT, artificial intelligence (AI), and cloud computing further enhances the capabilities of these systems, enabling smarter and more efficient industrial processes. Several studies in the literature [1-16] have explored automated bottle filling systems, utilizing various control techniques such as PLC, PID controllers, microcontrollers, and SCADA to enhance precision and efficiency. The presented works demonstrate a solid approach to automation; however, they lack a fully integrated IoT solution, which limits remote monitoring and real-time data analysis. Without IoT, system supervision remains local, reducing efficiency and adaptability. By incorporating IoT technologies such as cloud-based data storage and real-time mobile monitoring, the system could significantly improve performance by enabling remote control, predictive maintenance, and enhanced scalability. In this work, IoT has been utilized to enhance system monitoring and control. Remote monitoring via IoT ensures efficient management, reduces labor dependency, and optimizes the entire process. The bottle filling and capping process faces several challenges, including inefficiency, human errors, and high

operational costs. Manual operations are slow, prone to inconsistencies in liquid quantity, and lead to material wastage. Traditional automated systems, while effective, are often expensive and lack flexibility for small-scale industries. Additionally, limited remote monitoring capabilities hinder real-time supervision and predictive maintenance. By integrating IoT and microcontrollers like Arduino, these challenges can be addressed through real-time monitoring, cost-effective automation, and improved process efficiency, ultimately enhancing productivity and reducing labor dependency. **The primary goal of this work is to develop an efficient and automated bottle filling system that minimizes human intervention while ensuring high accuracy and productivity. By leveraging IoT and Arduino-based technologies, the system enables remote monitoring and real-time control, enhancing operational efficiency. This approach is particularly beneficial for industries such as beverage and pharmaceutical manufacturing, where precision and consistency are crucial. The integration of infrared sensors, relay drivers, and DC motors ensures smooth operation, while IoT-based supervision optimizes management, reduces labor dependency, and streamlines the entire process.**

II. MATERIALS USED

A. Infrared (IR) sensor

The infrared sensor is highly sensitive to ambient light and consists of an infrared emitter and receiver. The transmitter emits infrared rays at a specific frequency, which are reflected back to the receiver when they encounter an obstacle. The comparator circuit processes the signal, activating an indicator light and generating a low-level digital output.

Fig. 1.   Infrared (IR) sensor.

B. Diaphragm Pumps

Diaphragm pumps, also known as membrane pumps, are piston-driven pumps where the liquid does not come into contact with the machine's moving parts. This makes them ideal for pumping corrosive liquids or those containing solid particles. They are characterized by a low discharge flow rate (ranging from a few liters per hour to cubic meters per hour) and can reach discharge pressures of up to 300 bar. These pumps are self-priming and are only suitable for low-viscosity fluids.

Fig. 2.   Diaphragm Pumps.

C. Relay module

The relay is a controllable switch that isolates the control section from the power section. It is a widely used component when interfacing electronics with electrical systems. The relay allows opening or closing a contactor in a power circuit based on a signal ranging from 0 to 5V.
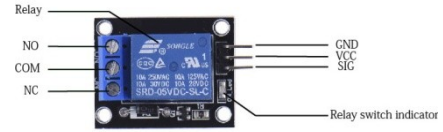

Fig. 3.   Relay module.

D. LCD Screen

The RW1063 IC controller integrates this 20x4 character LCD screen, offering multiple interface options such as 6800, 4-wire SPI, or I2C. The character size (AA) and pin layout of the WH2004G 20x4 LCD screen are identical to those of existing WH2004A and WH2004B character LCD modules, but with a smaller outline and VA size. This project utilizes the I2C interface. The I2C module allows parallel-to-serial conversion for LCD2004 and LCD1602 screens. With this module, the LCD screen can be connected using only two wires. Typically, LCD screens require eight pins, which may sometimes lead to a shortage of resources for the user. This module helps save resources by reducing the number of required pins to four while maintaining the standard power supply requirements.

Fig. 4.   Display LCD 20x4 with I2C

E. Stepper Motor Driver A4988

The stepper motor driver A4988 enables efficient motor control using only two control signals: STEP and DIR. The number of pulses sent to the motor corresponds to the number of steps taken, the pulse frequency determines the motor speed, and the DIR signal controls the rotation direction. The A4988 module sends the appropriate sequence to the motor's two coils based on the received input commands.
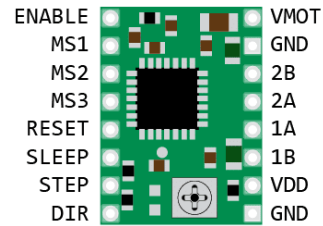

Fig. 5.   Stepper Motor Driver

F. Stepper Motor

A stepper motor is a simple brushless, two-phase synchronous motor consisting of a magnetized segmented rotor and a stator with a specific number of electromagnetic coils. When these coils are energized, they generate north and south poles that attract or repel the magnetized rotor segments, causing it to rotate. The illustration depicts the internal structure and tooth alignment of a conventional hybrid stepper motor. The finely spaced teeth are uniformly distributed across the diameter, enabling incremental angular rotation that produces mechanical movement.

Fig. 6. Stepper Motor

G. Arduino sensor shield

The Arduino Sensor Shield is a board that simplifies the connection of sensors, servomotors, and LCD screens to an Arduino board without requiring soldering. Thanks to the shield, each signal pin of the Arduino is connected to a dedicated 5V and GND connection. This makes prototyping and developing projects involving sensing and controlling the physical world much easier.

Fig. 7. Stepper Motor

H. DC motor

A direct current (DC) motor is a rotating electrical machine that converts electrical energy in the form of direct current into mechanical energy through electromagnetic interactions.

Fig. 8. DC motor

I. Servomotor

Servomotors, also known as servos, are precision drive devices that regulate speed, torque, and position with high accuracy. Unlike frequency converter drives, servomotors offer better efficiency and precise position control, even at low speeds. A servomotor integrates an internal encoder, which converts mechanical motion (shaft rotations) into digital pulses interpreted by a motion controller. Along with a driver, it forms a control circuit that manages position, torque, and speed.

Fig. 9. Servomotor.

J. Wi-fi Module

Wi-Fi modules are essential components in wireless connectivity, enabling various devices to communicate over wireless networks. They play a crucial role in modern communication systems. This article explores the features, types, and applications of Wi-Fi modules.

Fig. 10. Wi-fi Module

K. Conveyor

Chain conveyors are commonly used to transport various materials within industrial and logistics warehouses. They are particularly suited for moving heavy, sensitive, or bulky loads that require easy handling by operators. These systems typically consist of a chain driven by a motorized wheel and supported by rails or supports. Understanding the key components and operation of a chain conveyor is essential for optimizing its efficiency.

Fig. 11. Conveyor

L. Variable resistor

A variable resistor, also known as a rheostat, is a crucial electronic component used in various devices. Its ability to adjust and control electrical resistance makes it essential for numerous applications.

Fig. 12. Variable resistor

M. Robotic Gripper

The Gripper M.K.2 robotic gripper is designed for small robotic applications, allowing it to grasp objects up to 40 mm in size and weighing up to 150 g. It is relatively compact, measuring approximately 48.5 mm in length, 38 mm in width, and 41 mm in height. The gripper's maximum opening width is 42 mm.

Fig. 13. Robotic Gripper

N. Motor Driver

A motor driver is used to regulate the movement and direction of a motor by providing it with the appropriate current. Typically, the output of a motor control circuit is digital, allowing the use of Pulse Width Modulation (PWM) to control the motor speed. Essentially, motor drivers act as current amplifiers that follow input signals. They are also capable of controlling inductive loads such as relays, solenoids, and transformers.

Fig. 14. Motor Driver

III. SYSTEM DESCRIPTION

This section covers the implementation of components with Arduino, an essential approach for creating interactive electronic projects. Arduino, an open-source electronic prototyping platform, provides a solid foundation for integrating various components, enabling the development of innovative and customized systems. This section explores how components are connected and controlled within the Arduino architecture, providing a foundation for new electronic projects. The following figure (see Figure 15) illustrates the general mechanism of the automatic bottle filling system, which can be controlled by any type of microcontroller. The microcontroller manages the entire process, and with the aid of software, the entire system can be accessed remotely.
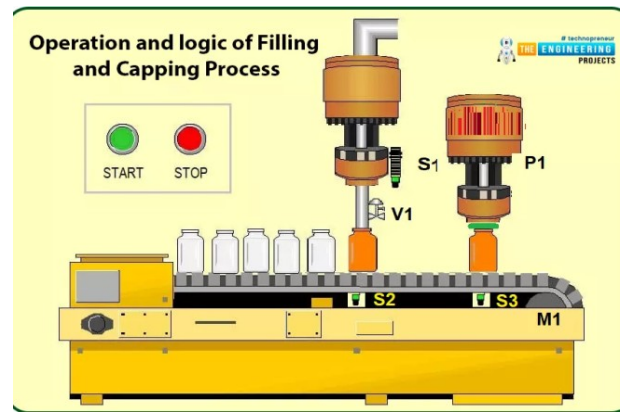

Fig.15. The Filling and Capping Process

To simplify the operation of the filling and capping process, Figure 15 illustrates the process flow, which consists mainly of the main motor driving the conveyor belt that carries the bottles, starting with the press of the start button. The conveyor belt begins moving, driven by motor M1, and the bottles travel along the belt until sensor S2 detects a bottle. At this point, motor M1 stops, and the conveyor belt halts. Simultaneously, valve V1 opens to allow water to flow into the bottle until it reaches a specific level detected by level sensor S1. Then, valve V1 closes, and motor M1 resumes operation. When sensor S3 detects a bottle, piston P1 is activated to cap the bottle, and the process continues in this manner. The automatic filling and capping system operates with a **total processing time of 40 seconds**, including **20 seconds for filling** and **5 seconds for capping**. It utilizes **IR sensors** to detect bottle positions and trigger actions. The system controls a **stepper motor** for conveyor movement, an **LCD screen** for process display, and a **Human-Machine Interface (HMI)** for user interaction.

A. Implementation of components with Arduino

Here, the electrical diagram shows all the connections between the Arduino and other modules. There are two power inputs: 5V via USB or 12V through the Arduino's barrel jack input, as well as a 12V power input for the two motors and the water pump. All module connections are linked to the Arduino Expansion Shield, which is mounted on the Arduino. This setup simplifies connections and allows a 5V power supply to be drawn from it.
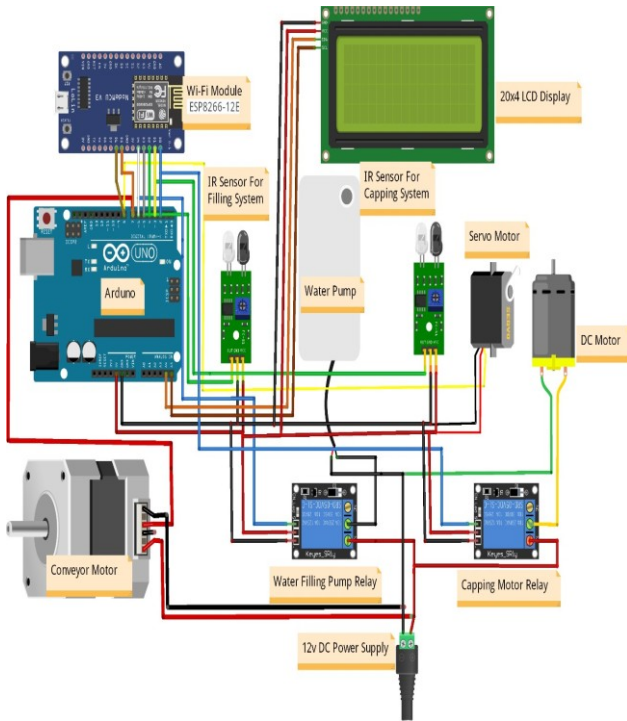
Fig.16. Arduino Connection with Other Modules

B. Workflow Diagram
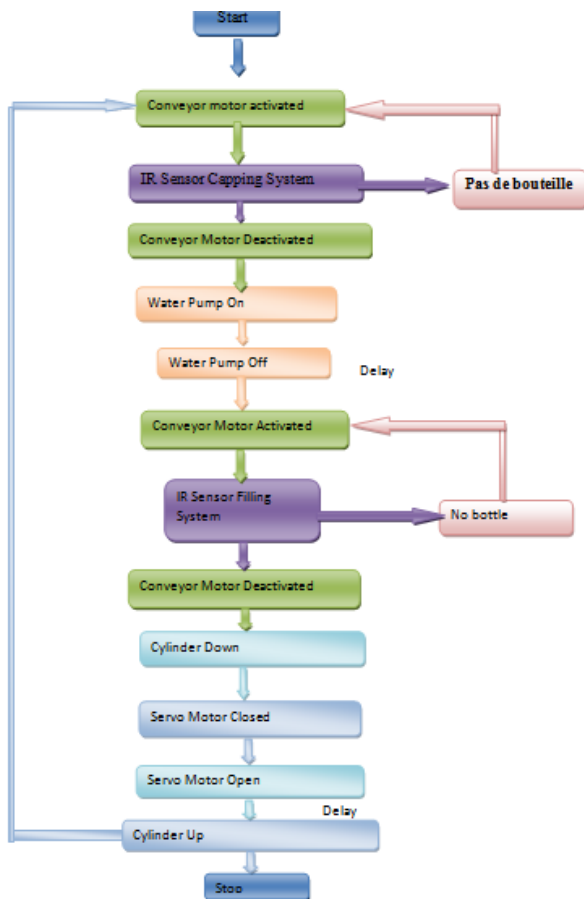
Fig.17. Workflow Diagram

C. Human –Machine Interface (HMI)

The Human-Machine Interface (HMI) is a system that allows a user to interact with a machine or system. Here, it displays the status of the modules and also enables process control. This HMI is Wi-Fi-based, where Arduino sends signals to a Wi-Fi module that creates a local web server on an IP address. The server can either host itself or connect to a network. The HMI uses AJAX, a web technology that enables asynchronous data updates without refreshing the entire page, thereby reducing display latency.

Fig.18. Human-Machine Interface(HMI)

IV. SYSTEM IMPLEMENTATION

A. Filling

Fig.19 shows the first stage of our work, the filling process. The IR sensor is positioned vertically on the water nozzle, located at the base of the support for the water pump and the relay. When the infrared sensor detects a bottle, the relay activates the pump via the Arduino. This process takes 20 seconds.

Fig.19. Filling System View

B. Capping

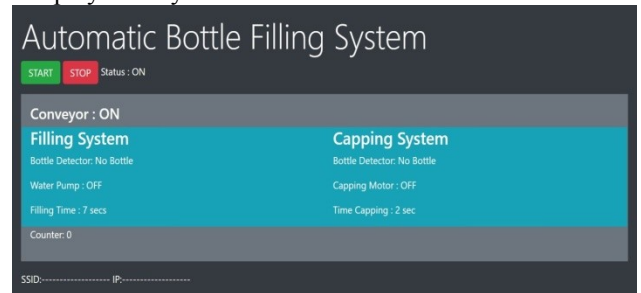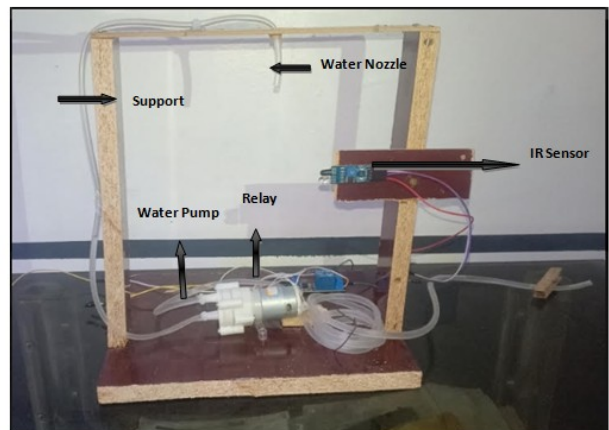Fig.20 shows the second part of our work, which is the capping stage. The IR sensor is positioned vertically on the actuator to detect the bottle. Additionally, there is a relay and a motor driver to control the capping operation. This process takes 5 seconds.

Fig.20 . Front and back images of the dam system

C. Global View of the system

Fig.21 shows the final aspect of the project: the conveyor belt starts, and the bottles move until the IR1 sensor detects the presence of a bottle. Then, the motor stops, and the belt ceases to operate. Simultaneously, the valve opens to fill the bottle with water up to a specific level. Once this level is reached, the valve closes, and the motor resumes its motion. Then, when the IR2 sensor detects another bottle, the piston is activated to seal the bottle, and so on. This process takes 40 seconds.
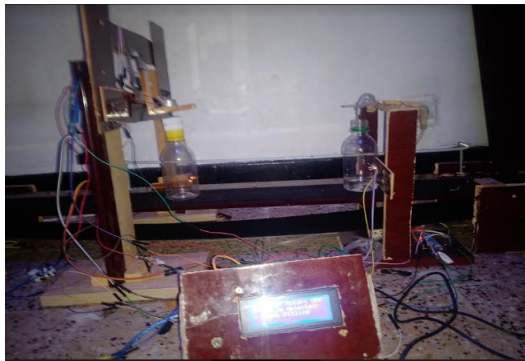

Fig.21 . Global view of the system

D. The LCD screen display

Fig.22 shows a conveyor system for bottle filling. The conveyor is running, but no bottle is detected. The message on the LCD screen indicates that the conveyor motor is running, but no bottle is present.

Fig.22 . The display of the conveyor motor

Fig. 23 shows a conveyor system for bottle filling. The conveyor motor is currently off, but a bottle has been detected. The message on the LCD screen indicates that the filling process should be started.

Fig.23 . The Filling display

Fig.24 shows a conveyor system for bottle capping. The conveyor motor is currently off, but a bottle has been detected. The message on the screen indicates that the capping process should be started.
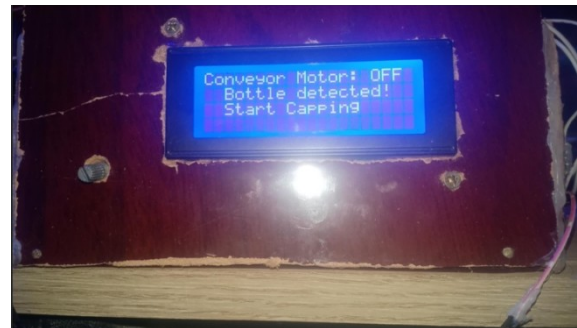
Fig.24 . The capping display

V. CONCLUSION

This work aims to design and implement an automatic bottle filling system using Arduino, an open-source microcontroller platform known for its affordability, flexibility, and ease of integration. By leveraging Arduino, the system offers a cost-effective solution compared to traditional industrial automation systems, making it accessible to small and medium-sized enterprises.

In summary, this project highlights the potential of Arduino as a low-cost yet powerful tool for industrial automation. By combining efficiency, reliability, and IoT capabilities, the proposed system supports the growing trend of smart manufacturing, helping industries optimize their production lines and stay competitive in an increasingly automated world.

REFERENCES

[1] S. L. Kulkarni and M. Elango, "Development of PLC based controller for bottle filling machine," Int. J. Innov. Eng. Res. Technol., vol. 3, no. 4, pp. 1–10, 2016.

[2] H. Arifianto, K. Adi, and C. E. Widodo, "Design of automatic bottle filling using raspberry pi," J. Phys. Appl., vol. 1, no. 1, pp. 10–13, 2018.

[3] K. Manhas, M. Dogra, R. Tiwari, and J. Sharma, "Design and Implementation of Bottle Filling Automation System for Food Processing Industries using PLC," Int. J. Power Electron. Control. Convert., vol. 5, no. 1, pp. 1–9, 2019.

[4] A. G. Gajjar, A. I. Patel, and R. G. Singh, "Design and development of bottle washer machine for small scale beverage industry," in 2015 Int. Conf. Adv. Comput. Eng. Appl., pp. 325–331, IEEE, March 2015.

[5] A. Bouhamadi, M. Aboulfatah, M. A. O. Sid Ahmed, and M. O. M. Mahmoud, "Study of the Automatic Filling and Capping System, using GRAFCET-GEMMA-PLC and WinCC Flexible," Int. J. Eng. Res. Technol., vol. 12, no. 6, pp. 736–744, 2019.

[6] S. R. Kurkute, A. S. Kulkarni, M. V. Gare, and S. S. Mundada, "Automatic liquid mixing and bottle filling—A Review," Int. J. Innov. Res. Electr. Electron. Instrum. Control Eng., vol. 4, no. 1, 2016.

[7] H. Shekhar, P. Thakur, M. Deepak, D. Khan, and C. Sulp, "Automatic Fluid Filling Unit by Using PLC," Int. J. Res. Publ. Rev., vol. 5, no. 4, pp. 8413–8423, 2024.

[8] H. Elahi et al., "Automatic Sorting, Counting and Bottle Filling Robotic Station," Int. J. Sci. Eng. Appl. Sci., vol. 3, no. 5, 2017.

[9] A. Al Nakib, R. Ahmmad, and S. Osman, "Design and implementation of PLC based automatic bottle filling," Int. Res. J. Eng. Technol., 2018.

[10] P. Prajapati, S. Singh, S. Gupta, and S. Srivastava, "Automatic bottle filling and capping system using PLC," Int. Res. J. Eng. Technol., vol. 6, no. 11, pp. 2395–0056, 2019.

[11] A. Faimeed, G. Ambekar, A. Adhav, S. Bedre, and V. Bhure, "Automated Water Bottle Filling System," Int. Res. J. Eng. Technol., vol. 9, no. 5, May 2022.

[12] V. P. Darji and B. G. Parmar, "Design and modeling of automatic bottle filling plant using geneva mechanism," J. Manuf. Eng., vol. 13, no. 2, pp. 075–081, 2018.

[13] J. Muralidharan, S. Saran, G. Tamilkavi, S. Thivakar, and M. Vivin, "An automatic fluid filling mechanism using delta PLC," in J. Phys.: Conf. Ser., vol. 1937, no. 1, p. 012004, IOP Publishing, June 2021.

[14] M. L. Ahmed, S. Kundu, and M. Rafiquzzaman, "Automatic bottle filling system using PLC based controller," J. Adv. Mech., vol. 4, no. 1, pp. 17–24, 2019.

[15] P. Kalubarme, M. Sushilkumar, and M. A. Malve, "Automatic water bottle filling system," Int. J. Innov. Eng. Res. Technol., pp. 1–3, 2018.

[16] N. Shaukat, N. Wahab, B. Rawan, Z. Uddin, and A. Mirza, "PLC based automatic liquid filling process," in IEEE Multi Topic Conf., December 2002.

People's Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

Mohammed BOUDIAF University of M'Sila

Faculty of Technology

The Electrical Engineering Laboratory organizes:

The First National Conference on Renewable Energies and Advanced Electrical Engineering

(NC-REAEE'25)

May 06-07th, 2025

Conference Objectives

This conference aims to explore the latest developments in the fields of renewable energy and electrical engineering by bringing together researchers, engineers, experts and PhD students to exchange ideas, present their latest research findings and discuss emerging challenges and innovations in the field of renewable energy and advanced electrical systems.

Themes

1. Renewable Energy and Green Hydrogen

2. Advanced control of Electric Machines

3. Power electronics and Smart Grid

4. Automatic and robotics

5. Electric vehicles technologies

6. Intelligent control and Optimization

Important dates

- **Paper submission Deadline: April 10, 2025**
- **Notification of Acceptance: April 25, 2025**
- **Camera-ready: May 01, 2025**
- **Symposium dates: May 06-07, 2025**

Honorary chairs

Pr. Amar BOUDELLA , Rector of University

Dr. Abdelkader DJERAD, Dean of Faculty

Conference chair

Dr. Abderrahim ZEMMIT

Scientific committee chairs

Pr. Ismail GHADBANE

Scientific committee

Pr. Sabir MESSALTI (University of M'sila)

Pr. Said BARKAT (University of M'sila)

Pr. Abdelghani HARRAG (University of Setif1)

Pr. Aissa CHOUDER (University of M'sila)

Pr. Djalal eddine KHODJA (University of M'sila)

Pr. Hani BENGASMIA (University of M'sila)

Pr. Mabrouk DEFDAF (University of M'sila)

Pr. Youcef BEKAKERA (University of Oued souf)

Pr. Yacine BENSAFIA (University of Bouira)

Dr. Yacine DAILI (University of Setif1)

Dr. Radhwane SADOUNI (University of Ghardaia)

Pr. Abdelhakim IDIR (University of M'sila)

Dr. Abdelmalik ZORIG (University of M'sila)

Pr. Ali DJRIOUI (University of M'sila)

Pr. Khatir KHETTAB (University of M'sila)

Dr. Amar GUICHI (University of M'sila)

Dr. Abdelouahab BOUKHALFA (University of M'sila)

Pr. Ali CHEBABHI (University of M'sila)

Dr. Abdelhafid BENYOUNES (University of M'sila)

Dr. Riadh BOUZIDI (University of M'sila)

Dr. Khaled BELHOUCHET (University of M'sila)

Dr. Naas DJEDAOUI (University of Djelfa)

Dr. Abdelouadoud LOUKRIZ (University of STHB)

Dr. Fares KHALFALLAH (University of M'sila)

Pr. Abderrahman BOUGERRA (University of M'sila)

Dr. Hilal RAHALI (University of M'sila)

Dr. Mohamed DAHMANI (University of STHB)

Pr. Loutfi BENYETTO (University of M'sila)

Dr. Redah CHEIKH (CDER- Bousmail)

Dr. Abdelouahab BENSEDIK (URAR Ghardaia)

Organizing chair

Dr. Riyadh ROUABHI

Organizing committee

Dr. Salim DJERIOU (University of M'sila)

Dr. Abdelghafour HERIZI (University of M'sila)

Dr. Faysal OUAGNI (University of M'sila)

Dr. Assam ZORIG (University of M'sila)

Dr. Abdelhakim DJAALAB (University of M'sila)

Participation fees

* Students: 2000 DA

* Academics: 4000 DA

* Industrials: 8000 DA

Secretariat

E-mail : **NC-REAEE25@univ-msila.dz**

Conference Web Site

https://media.univ-msila.dz/NC-REAEE25

Registration

Registration will be done on the Microsoft CMT :

https://cmt3.research.microsoft.com/NCREAEE2025

1985

جامعة محمد بوضياف - المسيلة
Université Mohamed Boudiaf - M'sila

NC-REAEE'25

Conference Program

Tuesday, May 6th 2025

🔍 **IBN AL-HAYTHAM Lecture Hall : https://maps.app.goo.gl/EDNkftHauFxdEvfK8**

Time	Event
[08:00] - [08:30]	**Welcome & Registration**
[08:30] - [09:00]	**Opening Ceremony** *Dr. Abderrahim ZEMMIT, General Chair.* *Dr. Abdelkader DJERAD, Dean of the Faculty of Technology, University of M'Sila.* *Pr. BOUDELAA Amar, Rector of the University of M'Sila.*
Plenary Session 1, **Chairs:** Pr. MESSALTI. S, Pr. HARRAG. A, Pr. HADJ ARAB. A , Pr. CHOUDER.A
[09:00] - [09:30]	**Plenary Talk 1: Demand side management effects on PV systems sizing** Pr. Smail SEMAOUI (CDER- Algiers, Algeria)
[09:30] - [10:00]	**Plenary Talk 2: Toward the application of advanced control and Embedded artificial intelligence to industrial systems: real cases studies** Pr. Bilal SARI (University of Setif1)
[10:00] - [10:15]	**Plenary Talk 3: The Past, the Present and the Future Vision of IEEE Algeria Section** Pr. Bilal ATTALLAH (Vice President of IEEE Algerian section)
[10:30] - [11:00]	**Coffee Break**
[11:00] - [12:30]	**Oral Session 1 (ROOM 01, 02, 03)** / *Faculty of Technology* **Poster Session 1** / *Faculty of Technology*
[12:30] - [14:00]	**Lunch**
[14:00] - [15:30]	**Oral Session 2 (ROOM 01, 02, 03)** **Poster Session 2**
[16:00] - [18:00]	**Online Session 1**
[18:00] - [20:00]	**Online Session 2**

The First National Conference on Renewable Energies and Advanced Electrical Engineering (NC REAEE'25)

May 06-07th, 2025

University of M'Sila

Faculty of Technology

Electrical Engineering Laboratory (LGE)

Wednesday, May 7th, 2025

Faculty of Technology: https://maps.app.goo.gl/B8AnPfAnaZwLbzbM6

[08:00] - [08:30]	Welcome & Registration, 2nd Day
Plenary Session 3, Chairs: Pr. BARKAT.S, Pr. Ali DJERIOUI, Pr. CHEBABHI A, Dr. GUICHI.A *(Hall L29- ST)*	
[08:30] - [09:00]	Plenary Talk 4: Photonic Crystal Structures for Photovoltaic Applications Pr. Mounir BOURAS (University of M'Sila)
[09:00] - [09:30]	Plenary Talk 5: A "How-to" on giving a Successful Conference Presentation Pr. Slimane BENMAHMOUD (University of M'Sila)
[09:30] - [09:45]	Plenary Talk 6: Sustainable Energy Transition in Algeria's Construction Industry: "Challenges, Opportunities, Policy Pathways, and Barriers" Dr. Khadidja RAHMANI (University of Blida1)
[09:45] - [10:00]	Coffee Break *(Faculty of Technology)*
[10:00] - [11:30]	Oral Session 3 (ROOM 01, 02, 03)
	Poster Session 3
[11:30] - [12:00]	Closing Ceremony (*L29 - Faculty of Technology*)
[12:00] - [13:00]	Lunch

* To view the full program, please scan the corresponding QR code.

Details of communications by session

Tuesday, May 6th 2025

📍 Faculty of Technology : https://maps.app.goo.gl/B8AnPfAnaZwLbzbM6

- ● **Oral Session 1**

ROOM 01

Chairs : Pr. Abderrahmen BOUGUERRA & Dr. Hilal RAHALI

Time	Paper ID	Author	Title	Establishment
11 :00-11 :15	111	Ahmed MESAI BELGACEM	Fault diagnosis of Photovoltaic Arrays Based on Extreme Gradient Boosting Learning	University of Jijel
11 :15-11 :30	226	Touil Abderrahim	Fault Detection and Control for Managing Multi-Fault Conditions in Power Inverters for Renewable Energy Systems	University of Constantine 1
11 :30-11 :45	08	Mourad Naidji	Optimizing Power Flow with Renewable Energy Sources: A Cost-Effective Approach	University of Annaba
11 :45-12 :00	268	Benzaoui Khaled	Implementation of a Combined Wind Turbine and DSIG System Using Real-Time HIL Simulation	University of M'sila
12 :00-12 :15	170	Hamouda Noureddine	Single Phase Active Power Filter for Selective and Global Harmonic Currents Mitigation using Modified PQ Theory	Research Center in Industrial Technologies-Cheraga

ROOM 02

Chairs : Dr. Khaled BELHOUCHET & Dr. Lakhdar MADANI

Time	Paper ID	Author	Title	Establishment
11 :00-11 :15	125	Taha Chettibi	A Hybrid Optimization Method for the Inverse Kinematics of Robotic Manipulators	University of Blida 1
11 :15-11 :30	158	Aicha Aziza Ayad	Experimental optimization of MAPbI3 perovskite solar structure: control of deposition speed (comparative study of optical and structural proprieties)	University of Djelfa
11 :30-11 :45	261	ARABA Mabrouk	Smart street lighting: remote control and energy saving	University of M'sila
11 :45-12 :00	54	Mohamed Lemine Bakayoko Yaye	Improved Control of PV System using Variable Step Size IC MPPT Method	University of Msila
12 :00-12 :15	57	Zaina Ait-Chekdhidh	PID-Funnel Control for the Speed of Wind Energy Systems for Maximum Power Point Tracking	University of Tizi Ouzou

ROOM 03				
Chairs : Pr. Khatir KHETTAB & Dr. Abdelouaheb BOUKHALFA & Dr. Khadidja RAHMANI				
Time	**Paper ID**	**Author**	**Title**	**Establishment**
11 :00-11 :15	**78**	Ouali Abdelhak	Fuzzy Logic-Based Direct Power Control of Three-Level Grid-Connected Inverters with Capacitor Voltage Balancing	University of Ouargla
11 :15-11 :30	**202**	Djaraf Nourelhouda	Hierarchical Control of Islanded Microgrids with GA-Optimized Virtual Inertia and Damping	University of Setif 1
11 :30-11 :45	**62**	Bounnah Abdelmalek	Parametric Analysis and Performance Optimization of an Adsorption Refrigeration System Using Activated Carbon-Methanol Pair	University of Constantine 1
11 :45-12 :00	**110**	Kheira KAHILI	Online Fault Detection and Diagnosis of Multiple Short Circuits Phases PMSG in Wind System Based on Decision Tree with Bayesian Optimization	University of Jijel
12 :00-12 :15	**102**	Berini Mohamed Rafik	Viscoelastic behavior and its effect on pumping energy under the influence of petroleum extract	University of M'sila

- **Poster Session 1**

Paper ID	Author	Title	Establishment
Poster Session 1 / *Faculty of Technology*		
Chairs : Pr. Fouad BERRABAH & Pr. Loutfi BENYETTOU & Dr.Mabrouk DEFDAF & Pr. BELKHIRI Salah		
138	Meftah allal	Development of Advanced Recycled Concrete: Electrically Insulative and Resistant to Ground Current Propagation	University of Biskra
29	Boudab Smail	Multi-objective Combined Economic Emission Dispatch solution using a Recurrent Neural Network	University Oum El Bouaghi
137	TOUIL Issam	Design and Control of an Industrial Exoskeleton Using Arduino-Based System and Hydraulic Actuation	Center of Research in Mechanic-Constantine
259	El Hadi Belhiteche	Influence of electrical stress on the dielectric properties of the epoxy resin used in the electrical machines insulation	University of M'sila
235	Karim Fathi Sayeh	AI-Based Direct Power Control for WT-DFIG Systems	University of Bejaia
60	BERKANE Amina	Exploring the Interplay Between Green Hydrogen Production and Microscopic Magnetization	University of M'sila
248	Imene Moumeni	A new design of a two-channel demultiplexer based on a photonic crystal ring resonator	University of Constantine 1
139	Mokrane Hamza	Distributed Watermarking for Detect Replay Attacks for 4 DGUs in DC Microgrids with Variants Loads	University of Medea
103	Hadji Chaabane	A Hybrid Robust Backstepping Sliding Mode Controller design for double star induction Machine DSIM	University of M'sila
207	Imane CHERGUI	Ultra Small Optical Photonic Crystal XOR Logic Gate	University of Constantine 1
51	Ladjal badreddine	Using FTC based on BSC and nonlinear adaptive observer for dual star induction machine modeling and control	University of M'sila
233	LARBA MOHAMMED	Fuzzy Sliding Mode Control of a Double-Star Asynchronous Machine Powered by Two Three-Level Voltage Inverters	University Béjaia
205	Hadji Chaabane	Extended Kalman Filter for Speed Sensorless Control of double star Induction Motors DSIM with Estimations of Rotor flux and Load Torque	University of M'sila
47	DJOURNI Youcef	Mitigating Constant Power Load-Induced Instability Using Fractional Order Buck Converter and Backstepping Control	University of M'sila
90	Bekhiti Abdellah	Enhanced UAV Fault Diagnosis and Compensation via Nonlinear Disturbance Observer and Adaptive Control	University of Ourgla
260	Lallouani HELLALI	Application of the Fourier Transform for the Fault broken Rotor Bars Detection in Induction Motors	University of M'sila

• Oral Session 2

ROOM 01

Chairs : Dr. Amar GUICHI & Dr. Bilal Djamal Eddine CHERIF

Time	Paper ID	Author	Title	Establishment
14 :00-14 :15	45	Mohammed Messaoud Zioud	Direct Power Control of Two-Level Grid-Connected Converters Using Fuzzy Logic Controller	University of Ouargla
14 :15-14:30	76	Belkacem Merzouk	The contribution of photovoltaic energy in textile wastewater treatment using electrochemical processes	University of M'Sila
14 :30-14 :45	167	Zorig assam	Detection of Rotor excentricite Fault In Induction Machine Based On Stray Magnetic Flux.	University of M'Sila
14 :45-15 :00	128	BOUDAB Smail	Environmental/Economic Dispatch Problem Solution Based on Quasi-Lagrangian Dynamic Neural Network	University Oum El Bouaghi
15 :00-15 :15	250	Oussama Djaidja	Fault Tolerant Control based on ILC control Application to DFIG	University of M'sila

ROOM 02

Chairs : Dr. Khaled BELHOUCHET & Dr. Lakhdar MADANI & Pr. Sabir MESSALTI

Time	Paper ID	Author	Title	Establishment
14 :00-14 :15	206	Bentafer Raouf	A enhanced pll architecture for stability improvement of grid-connected converters under weak grid and fault-ride through conditions	University ferhat abbas setif 1
14 :15-14:30	03	Bennia Rachid	Performance Improvement of Partially Shaded PV Systems through Optimization Algorithms: Comparative Analysis of Classical and recent Techniques	Ecole Nationale Polytechnique, Alger
14 :30-14 :45	122	Tarek Bouguerra	Performance Enhancement of Standalone Photovoltaic System Using Variable Step Size MPPT Techniques	University of Constantine 1
14 :45-15 :00	184	Saber BOUAFIA	Improving Power Quality in Four-Wire Distribution System Using a four Legs Distributed STATCOM	University of M'sila
15 :00-15 :15	109	Tarek BOUDJERDA	Proposed energy management for a PV/WT-DFIG microgrid with energy storage system	University of Bejaia

ROOM 03

Chairs : Dr. KHALFALLAH fares & Dr. KEBAILI Farida & Dr. Adel BALLOUTI

Time	Paper ID	Author	Title	Establishment
14 :00-14 :15	11	Benkaihoul Said	Fault Detection in Photovoltaic Systems using WGformer: A Weibull-Gaussian Informer	University of Djelfa Djelfa

14 :15-14:30	48	Ladjal badreddine	Sturdy Adaptive Fuzzy Backstepping Control for Enhanced Tracking Performance in a 2-Dof Laboratory Helicopter System	University of M'sila
14 :30-14 :45	04	Samia Satta	Electrical Equivalence between Plan-Plane and Multi Points-Points Systems InThe Development of Parallel Discharges on Insulating	Research center of industrial technologics CRTI
14 :45-15 :00	88	Naima Amina	Design and Optimization of a 2D radial flux Permanent Magnet Eddy Current Coupler PMECC	University of USTHB
15 :00-15 :15	258	Aboubaker Essaddiq MAZOUZ	Comparative Study between Venturini and SVM Control in Matrix Converters with DFIG Based Wind Turbines	University of Tiaret

• **Poster Session 2**

Paper ID	Author	Title	Establishment
Poster Session 2 / _Faculty of Technology_
Chairs : Dr. Moufdi HADJAB & Pr. Mohamed LAADJAL & Dr. Assam OUALI & Pr. Bilal ATTALLAH
252	Karim Fathi Sayeh	Intelligent energy management of micro-grid system associated with hybrid energy storage system	University of Bejaia
201	Nacer Merabet	Inter-Turn Fault Diagnosis and Fault-Tolerant Control for Induction Motors	University of constantine1
61	BERKANE Amina	Analytical Characterization of Density, Magnetization, and Current in 2D Electron Gases	University of M'sila
147	Bouchareb Khaled	Performance Comparison of the Andasol-1 Solar Power Plant Under Algerian and Spanish Climatic Conditions	University of M'sila
79	Bakayoko Yaye Yébé	Comparative Study Between Five MPPT Techniques applied to PV System	University of M'sila
247	Khennouf salah	Boosted Photoconversion Efficiency of Silicon Solar Cells via Spectral Management Using Wavelength-Selective Optical Filters	University of M'sila
46	DJOURNI Youcef	Fractional Order Modeling for Improved Stability of DC Microgrids under Dynamic Conditions	University of M'sila
176	Ouali Abdelmoumin	Detection of Stator Winding Faults in Permanent Magnet Synchronous Motor Based on Signal Processing	University of Biskra
213	Benabbas Sabrina	Modeling and Evaluation of the Solar Resource in the M'Sila Region Using MATLAB Tools	University of Bordj Bou Arreridj
267	Charik Khalissa	Design and Simulation of a High-Speed Photonic Crystal Half Adder Applying Nonlinear Kerr Effects	University of Constantine 1
208	Chergui Imane	A Novel Optical Diplexer Design Using Core–Shell Rod Defects in Photonic Crystals	University of Constantine 1
42	MILOUDI Khaled	Deep Learning for Wind Energy Prediction from Meteorological Data and Its Application to Renewable Energy Systems	University of El Oued
118	Chettouh Salah	Modeling of Short Channel Effects in Scaled FinFET Structure	University of Boumerdes
238	Lahlou Abad	A Comparative Analysis of SP and TCT Configurations with Resistance Variation Impacts in PV Systems	University of Bejaia
131	Khaled Belhouchet	Electric Field Stress Mitigation in Polymeric Insulators Using ZnO-Based Nonlinear Coatings: Simulation and Analysis	University of M'sila
178	Leila BECHANE	Improving the performance of a SnO2/CuO/GaAs solar cell using numerical simulation	University of M'sila
119	Ayoub Dehikel	Advanced FPGA Implementation of the Simplified Space Vector Modulation for Multilevel Converters	University of Ouargla

Wednesday, May 7th, 2025

- **Oral Session 3**

ROOM 01

Chairs : Dr. Youcef Brik & Dr. Mohamed SAHED

Time	Paper ID	Author	Title	Establishment
11 :00-11 :15	152	CHABIRA Chaima	Leaks Detection in WDNs Using Pressure Signals Based on CWT and CNN	University of M'sila
11 :15-11 :30	269	Meryem KETFI	Deep Learning with Skip and Residual Connection for Lung Cancer CT Scan Classification	University of M'sila
11 :30-11 :45	239	NADIR Cheyma	One VS Multi-instance biometrics system using Palmprint	University of M'sila
11 :45-12 :00	164	Douiou Zoulikha	On the parameter estimation of CGLNT radar clutter	University of M'sila
12 :00-12 :15	84	Moustari Mohamed Abderaouf	Deep and handcrafted feature fusion system for Diabetic Retinopathy detection and classification	University of M'sila

ROOM 02

Chairs : Pr. Djamel ALLALI & Dr. Zohra ZERDOUMI & Dr. ELBAR Mourad

Time	Paper ID	Author	Title	Establishment
11 :00-11 :15	96	MEFTAH Sabir	Wavelet Transforms and AI Integration for Enhanced signal Quality to an Efficient Leak Detection	University of M'sila
11 :15-11 :30	246	Ishaq Aiche	Detection of Diabetic Retinopathy in Fundus Images Using the Hybrid Inception-ResNet-v2 Model	University of M'sila
11 :30-11 :45	270	Imad Eddine Djerarda	A Deep Learning-Based Real-Time Driver Safety System for Drowsiness	University of M'sila
11 :45-12 :00	38	Fares bettahar	Experimental Optimization of Photovoltaic System Performance	University of Biskra
12 :00-12 :15	105	Aoufi Saliha	Control of a Photovoltaic Pumping System Using the Artificial Bee	University of M'sila

ROOM 03

Chairs : Pr. Ismail GHADBANE & Dr. ABED Ahcene & Dr. ZORIG Assam

Time	Paper ID	Author	Title	Establishment
11 :00-11 :15	212	Hadjab meryem	Fuzzy logic applied to the direct torque control (DTC) of a doubly star induction machine (DSIM)	Universite of M'sila
11 :15-11 :30	219	Mezrag Fadila	Band Gap Energies of lattice matched GaxIn1-xAsyP1-y quaternary alloys to InP and GaAs substrates	University of M'sila
11 :30-11 :45	194	Kouici haroun	Optimization and Simulation of Photonic Crystal Coupled Cavity-Waveguide Structures for Sensing	University of Blida1

11 :45-12 :00	**216**	Khalissa Saada	Sustainable Performance of Sisal and Luffa Fibers in Green Hydrogen Systems	University of M'sila
12 :00-12 :15	**69**	Zegaar Imane	Band-stop plasmonic filter in the mid-infrared range based on metal-insulator-metal (MIM) waveguide.	University of M'Hamed Bougara

• Poster Session 3

ID	Author	Title	Establishment
	Poster Session 3 / *Faculty of Technology*		
	Chairs : Pr. Izzeddine CHALABI & Dr. Salah KHENNOUF & Dr. Haddi BAKHTI & Pr. Torkia GHELLAB		
23	Rahali Hilal	Analyzing and modeling an insulating surface's leakage current in high voltage	University of M'sila
150	Sabah Touahria	Experimental study of the absorption of capillary water in a compressed and stabilized mud brick	University of M'sila
244	Mezaache Hatem	Hybrid Model for short-term Solar Energy Forecasting Based on Decomposition Techniques with Sample Entropy and Bidirectional Deep Neural Networks	University of M'sila
129	Khaled Mahdi	Production of electric current using a solar concentrator	University of M'sila
148	LOUAKHCHE FATIHA	Compact SIW Band-pass Filters in [2-12 GHz] for Telecommunication Systems	University of Blida 1
189	Nafissa Moussaoui	Assessment of the efficacy of double junction solar cells (GaAs/a-Si) in relation to temperature effects numerically	University of M'sila
182	Bakhti fatima zohra	Thermal Performance Analysis of a Flat-Plate Solar Collector	University of M'sila
172	Gouri Amel	Modeling and Simulation of a Single-Phase Inverter Based on Unipolar SPWM Technique	University of M'sila
15	Dilmi Ali	Evaluating the impact of varied capacitance values on the performance of Self-Excited Induction Generator Using Finite Element Method	University of Bouira
188	Choug Noreddine	Adaptive and Robust Control of DFIG-Based Wind Energy Conversion System Using Fuzzy Logic	University of M'sila
257	Mohammed Soufiane Chekembou	Assessment of FACTS Devices for Enhancing Stability in Solar Photovoltaic Integrated Power Systems	University of Laghouat
64	Mohammed Lakhdar Nebbar	Transfer of the charge dissipated by a hydraulic jump to electrical energy	University of M'sila
153	Bensehil Ilhem	First-principles study of lead-free double perovskite Cs2SiBr6 for solar cells and renewable energy	University of M'sila
222	Zemouri Nahed	Improved Solar Energy Prediction via Linear Fusion of Multiple Machine Learning Models.	University of M'sila
05	Ammi Hadjer	Structural and electronic properties of complex hydrides XAlSiH (X = Sr, Ca, and Ba) intended for hydrogen storage: an ab-initio study	University of Bouira
211	Hadda Tiouiri	Calculations of the Structural, Electronic, Optical, and of CdSiX2 (X ¼ P, As) Compounds Based on First-Principles Theory	University of M'sila

Tuesday, May 6th 2025

- **Online Session 1 (ROM 1,2,3,4,5) / Time :16 :00-18 :00**

ROOM 01 / Google meet Link: https://meet.google.com/xpi-mgig-mbw
Topic: Advanced control of Electric Machines
Chairs: Dr. Kada BOUREGUIG & Dr. GUICHI Amar

Time	Paper	Author	Title	Establishment
16 :00-16 :15	ID 190	Khaled SAHRAOUI	Speed Sensorless Sliding Mode Control of DSIM using MRAS and Extended Luenberger Observer	University of Laghouat
16 :15-16 :30	ID 113	Hamoudi Yanis	Virtual Voltage Vector Predictive Power Control for Dual-Star Induction Machine WECS	University of Bejaia
16 :30-16 :45	ID 35	Imad Eddine Harzelli	Online detection of broken rotor bar faults in induction motors using a model-based approach integrated with input-output feedback linearization control	University of BISKRA
16 :45-17 :00	ID 49	Imad Eddine Harzelli	Electromagnetic Torque Analysis for Diagnosing Static Air-Gap Eccentricity Fault in Squirrel Cage Induction Motors	University of BISKRA
17 :00-17 :15	ID 17	Mabrouk Younes Abdelbadie	Contribution to the harmonic analysis of a classic DTC control and that with a reduced switching table applied to an IM	University of Laghouat
17 :15-17 :30	ID 209	Sofiane Brahami	Improved Sliding Mode Control Using Field-Oriented Control of Three Phase Induction Motor	University of Bejaia
17:30-17 :45	ID 168	Fayçal HASSAINI	New mathematical models of DSPMSM considering neutral points configuration	University of Bejaia
17:45 - 18:00	ID 19	Toumi Djaafar	Implementation of PSO, P&O and INC algorithm on MPPT PV System using Arduino	University of El oued

ROOM 02 / Google meet Link: https://meet.google.com/ota-scus-mxr
Topic : Advanced control of Electric Machines
Chairs : Dr. Abdelbasset BARKAT & Pr. Izzeddine CHALABI

Time	Paper	Author	Title	Establishment
16 :00-16 :15	ID 107	Oualid Djoudi	Field-oriented control versus direct flux-vector control for stand-alone DFIG-based wind power system	University of Bejaia
16 :15-16 :30	ID 27	KHADAR Saad	Advanced sensorless control method based on a genetic algorithm	University of Djelfa
16 :30-16 :45	ID 185	Djamel Difi	Enhanced Dynamic Performance of Five-Phase Permanent Magnet Synchronous Machines through Space Vector Modulation-Based Vector Control	Higher National School of R E, Batna, Algeria
16 :45-17 :00	ID 85	Hamdane Houssem	Effectiveness of Vibration analysis in detecting Mechanical faults in an Induction machine using FFT and DWT techniques	University of Annaba
17 :00-17 :15	ID 73	Mohamed Haithem LAZREG	Optimization-Based Sliding Mode Control of Permanent Magnet Synchronous Motor Using GWO Algorithm	University of Tlemcen

Time	Paper	Author	Title	Establishment
17 :15-17 :30	ID 186	Mohamed Haithem LAZREG	High-Performance MPPT of Permanent Magnet Synchronous Generators Using Sliding Mode Control	University of Tlemcen
17:30-17 :45	ID 95	Alili Zakaria	Revolutionizing Sensorless BLDC Motor Control: A Novel Back-EMF Observation Technique for Precise Speed Management Across All Ranges	University of M'sila
17:45 - 18:00	ID 41	ghezouani abdelkader	Finite time control design for solar water pumping system with induction motor	University of Bechar

ROOM 03 / Google meet Link: https://meet.google.com/bhf-viyv-zxh				
Topic : Microelectronics, Electromagnetics and Telecommunications				
Chairs : Pr. Slimane BENMAHMOUD & Dr. Fayssal OUAGUENI				
Time	Paper	Author	Title	Establishment
16 :00-16 :15	ID 179	Seghiour Rima	Design of a Frequency-Reconfigurable Antenna for 5G Applications	University of M'sila
16 :15-16 :30	ID 93	Maoucha Abdelhak	Toward High-Efficiency, Lead-Free Perovskite Solar Cells: The Role of Gold Nanoparticles and Design Parameters	University of Batna 2
16 :30-16 :45	ID 264	Zineddine Sarhani KAHHOUL	Improving Speech Emotion Recognition: A Control-Based Approach with Spectrograms and Ensemble Voting	University of Biskra
16 :45-17 :00	ID 196	Amal Sila	High Isolation GYSEL Power Divider with fixed characteristic Impedance	University of M'sila
17 :00-17 :15	ID 245	Mecelti Amel	Propagation of self-similar optical solitons in optical medium.	University of Souk-Ahras,
17 :15-17 :30	ID 191	Touaibia soumia	Multimodale soft biometric for predictions gender age and gender	University of M'sila
17:30-17 :45	ID 80	GOUMIDI Mohammed Abdessamad	Multi-Attacks Intrusion Detection and Identification System for Wearable Medical Networks	Université des ST d'Oran
17:45 - 18:00	ID 124	Zohra MEHAR	Modeling and Analysis of Faults in Robotic Machining Cells using Lambda Petri Nets	University of Oran2

ROOM 04 / Google meet Link: https://meet.google.com/ege-uifg-cve				
Topics : Electric vehicles technologies/Automatic and robotics				
Chairs : Dr. Amar Rouag & Dr. Fares KHALFALLAH				
Time	Paper	Author	Title	Establishment
16 :00-16 :15	ID 52	Boughezala Hamad Haithem	Performance Analysis of the five phase permanent magnet Synchronous Motor	University of Djelfa
16 :15-16 :30	ID 71	BECHAR Mansour	Control of Induction Motor using Nonlinear PI Controller for Electric Vehicle	University of BECHAR
16 :30-16 :45	ID 53	AOUADJ Norediene	Development of Direct Yaw Moment Control for an Electric Vehicle based on Fuzzy Logic	Higher School (ESGEE), Oran
16 :45-17 :00	ID 133	Nassim Sabri	Electric vehicle fault detection systems	University of USTHB
17 :00-17 :15	ID 187	OULAD LAID Fatima Zohra	DairAI: AI-based firefighting system using drones for fire prediction, detection, and fighting	University of Ghardaia

17 :15-17 :30	ID 25	RAHAL Mohamed Ilyas	IoT-Driven Automatic Bottle Filling and Capping System Using Arduino	University of Annaba
17:30-17 :45	ID 228	MADDI Zakari	Performance Enhancement of Squirrel Cage Induction Motors Using a New Deep-Slot Design	University of Bejaia
17:45 - 18:00	ID 262	Loubna KHELLAF	Performance Comparison of Conventional and PID-Enhanced MPPT Strategies for Photovoltaic Systems under Environmental Variations	National Higher School of Technology and Engineering - Annaba

ROOM 05 / Google meet Link: https://meet.google.com/nhn-rmmm-azb				
Topic : Power electronics and Smart Grid				
Chairs : Dr. Chouaib AMMARI & Dr. Salah KHENNOUF				
Time	Paper	Author	Title	Establishment
16 :00-16 :15	ID 166	Bousnoubra Choayb	Mitigation of Voltage Disturbances Using Series Active Power Filter	University of Souk-Ahras
16 :15-16 :30	ID 145	Belkacem Houara	FS-MPC And Fuzzy Logic Technics Applied To A Grid-Connected Photovoltaic System	University of Oum El Bouaghi
16 :30-16 :45	ID 218	Zakaria REGUIEG	Smart Voltage Regulation with PV-Based DVR Using Load Voltage Control	University of Chlef
16 :45-17 :00	ID 242	Samir Kennouche	Hybrid PSO-FVSI Approach for Loadability Enhancement in Transmission Networks Under Voltage and Losses Constraints	University of Bejaia
17 :00-17 :15	ID 210	AZAIZIA Zoubida	Geometric Method for Reducing Peak Surface Stress in 60kV XLPE Cable Terminations	Ecole Nationale Polytechnique of Algiers
17 :15-17 :30	ID 22	Mohamed Tayeb Boussabeur	Quasi Z-Source Inverter Using a Simple Boost Control Technique	University of Biskra
17:30-17 :45	ID 72	Si Youcef Hamza	Performance Comparison of PI and Fuzzy PI Controllers in Multilevel DC-DC Boost Converters for Enhanced Voltage Regulation in Telecom Power Systems	Univercity of Mascara
17:45 - 18:00	ID 116	Chahrazed Boucetta	Impact of PCM Distribution on Heat Transfer Efficiency in Hydrogen Storage Reactors	University of Oum El Bouaghi

- **Online Session 2 (ROM 1,2,3,4,5) / Time :18 :00-20 :00**

ROOM 01 / Google meet Link: https://meet.google.com/yow-afcy-vtb
Topic : Renewable Energy and Green Hydrogen
Chairs : Dr. Abdeloudoud LOUKRIZ & Dr. Zine elabidine DAHMANE

Time	Paper	Author	Title	Establishment
18 :00-18 :15	ID 39	Youcef Maalem	Performance Optimization and Organic Fluids Selection of Solar Thermal Electric Generation	Ecole Nationale Polytechnique de Constantine
18 :15-18 :30	ID 55	Chafa mohamed	Implementation of PWM Control for Static Converters used in Photovoltaic Solar Systems	University of constantine 1
18 :30-18 :45	ID 127	Baala Seddik	Fuzzy Logic MPPT for Solar PV Systems: Intelligent Control for Maximum Energy Harvesting	University of Adrar
18 :45-19 :00	ID 204	OUINTEN Mohammed	Design and implementation of an electronic load for characterizing photovoltaic modules	University of M'sila
19 :00-19 :15	ID 220	Houcem achouri	Artificial Neural Network Controller For Magnetic Gear Generator For Wind Power System	University of Setif 1
19:15-19 :30	ID 83	YOUNES Abdelbari	Studying lightning strikes in wind turbines with square-shaped grid grounding systems	University of Tiaret
19:30-19 :45	ID 07	Messaoud SANDALI	Harnessing Solar Energy for Efficient Drying of Clay Bricks	University of Ouargla
19:45 - 20:00	ID 34	Guendouz Atika	From Structure to Spintronics: A Comprehensive Study of LiNpO3 Perovskite	University of Oran1

ROOM 02 / Google meet Link: meet.google.com/fnu-waav-wrz
Topic : Renewable Energy and Green Hydrogen
Chairs : Dr. Moufdi HADJAB & Dr. Mohamed Assam OUALI

Time	Paper	Author	Title	Establishment
18 :00-18 :15	ID 37	Drici Manal	Performance Evaluation of Renewable Hybrid Distributed Generation System Using the Smell Agent Optimization Technique	University of Annaba
18 :15-18 :30	ID 75	lasri aymen abdellah	Numerical Investigation of Phase Change Materials for Thermal Management in Lithium-Ion Battery Packs Using ANSYS	University of science and technology Oran
18 :30-18 :45	ID 160	Ahmed Faris Amiri	A Comparative Analysis of Regression Models for Predicting PV Power	University of M'sila
18 :45-19 :00	ID 121	Yassmine BOUCHERIT	Modeling and Simulation of DC Hybrid Renewable Energy Systems for Optimal Performance Using MATLAB/Simulink	University of Constantine 1
19 :00-19 :15	ID 82	Saidi youcef	Evaluating Aggregated Models of DFIGs-based on wind farm under Different Received Wind Speeds	University of Saida
19:15-19 :30	ID 236	Haouari CHARIK	Enhancement of light absorption in thin-film organometal trihalide perovskite solar cells via photon recycling mechanisms	University of M'sila
19:30-19 :45	ID 30	Iftissen Nabil	Maximum Power Extraction in Photovoltaic Systems: comparison of P&O and ANN based MPPT algorithms.	University of Médéa

| 19:45 - 20:00 | ID 265 | KADI Sara | Enhanced High-Order Sliding Mode Control for Maximum Power Point Tracking in DFIG-Based Wind Energy Systems | USTHB |

ROOM 03 / Google meet Link: https://meet.google.com/nit-dtjq-jco
Topic : Renewable Energy and Green Hydrogen
Chairs : Pr. Khatir KHETTAB & Dr. Abdelhafid BENYOUNES

Time	Paper	Author	Title	Establishment
18 :00-18 :15	ID 240	Benatallah Yacine	Design and Simulation of the PV Solar System and MPPT with PI Controller Based on P&O Algorithm	University Centre of EL Bayadh
18 :15-18 :30	ID 165	Mohammed YOUNES	Effect of dust accumulation on degraded PV panels in hot desert climate: a case study	University of Constantine 1
18 :30-18 :45	ID 234	Zahia DJEBLAHI	Identification of the Solar Photovoltaic Parameters Using Mountain Gazelle Optimizer Algorithm	University of Biskra
18 :45-19 :00	ID 100	ZERGLAINE Abdelaziz	Comprehensive Analysis of Electrical Fault Diagnosis in Photovoltaic Arrays	University of CHLEF
19 :00-19 :15	ID 193	CHABNI khadidja	Comparative study and performance evaluation of Different Converter Configurations (String and Centralized) used in Photovoltaic Systems	University of Laghouat
19:15-19 :30	ID 36	Moussa Zohra	Structural, optical, and photocatalytic properties of Fe_2O_3 thin films prepared by spray pyrolysis	University of Oum El Bouaghi
19:30-19 :45	ID 237	MEZZAI Nabil	Analyzing the Influence of Mismatch Defects and Shading on Photovoltaic Panel Output	Université de Bejaia
19:45 - 20:00	ID 81	Abdel Djabar Bouchaala	Optimal Sizing of a Hybrid Renewable Energy System Using Different Optimization Techniques	University of Skikda

ROOM 04 / Google meet Link: https://meet.google.com/ypw-crww-jbm
Topic : Power electronics and Smart Grid
Chairs : Dr. Brahim Gharbi & Dr. Abdelhakim DJALAB

Time	Paper	Author	Title	Establishment
18 :00-18 :15	ID 156	Alla Boukhdenna	Enhanced DC Bus Voltage Regulation Using a Grey Wolf Optimization Tuned PI Controller under Dynamic Load Conditions	National Higher School of Technology and Engineering
18 :15-18 :30	ID 154	Alla Eddine Boukhdenna	A Comparative Study of the Effectiveness of Particle Swarm Optimization and Gray Wolf Optimization Algorithms in MPPT for PV Systems	National Higher School of Technology and Engineering
18 :30-18 :45	ID 144	Zakaria Belboul	Optimal Sizing of an Autonomous Microgrid: A Comparative Study of Two Metaheuristic Optimization Algorithms	University of Djelfa
18 :45-19 :00	ID 140	Meriem Boudjemaa	Load Response of Grid Following and Grid Forming Inverters.	University of Constantine
19 :00-19 :15	ID 87	Hala Lalaymia	Comparative Study of PI and PR Controls for Single Phase Single Stage Grid Connected PV System	École Nationale (ENSTI)
19:15-19 :30	ID 01	Badreddine Bendriss	Smart incorporation of renewable distributed generations for power loss reduction and voltage profile enhancement in radial distribution grids	University of Setif 1

| 19:30-19 :45 | ID 112 | Abdelouahad MAY | An innovative predictive control model applied to a grid-connected qZSI based on power compensation | University of Setif 1 |
| 19:45 - 20:00 | ID 255 | Abdelkrim. BENALI | Voice-Controlled Lifting Barrier via Bluetooth-Enabled Smartphone | University Center El Bayadh |

ROOM 05 / **Google meet Link:** meet.google.com/azj-cooy-yoh
Topic : Power electronics and Smart Grid
Chairs : Dr. Mourad ELBAR & Dr. Abdelkader MOHAMMEDI

Time	Paper	Author	Title	Establishment
18 :00-18 :15	ID 104	SOUMEUR Mohammed Amine	Optimization of energy management system Using ECMS and EEMS strategies for a standalone fuel-cell hybrid power system	Higher Normal school of Bechar
18 :15-18 :30	ID 56	Khames Walid	High-Performance Continuous Query Processing for Big Data Streams: GPU-Optimized Skyline Queries for Traffic Monitoring and Route Optimization	University of Blida1
18 :30-18 :45	ID 163	HAMDAD Sadjia	Forecasting Hydrological Regimes Using Markov Chains to Optimize Water Resource Management in the Context of the Eco-Energy Transition	University of Tizi-Ouzou
18 :45-19 :00	ID 200	Khelil Mohamed Imed	Anomaly Detection Based on DBSCAN clustering approach for Water Quality Assessment.	University of M'sila
19 :00-19 :15	ID 120	Yaakoub Diboune	Application of Lissajous curves for fault detection and analysis in Doubly-fed induction generators	University of Blida 1
19:15-19 :30	ID 108	Kimi Imad Eddine	Real-time Monitoring of Pariculate Triboelectric Charge Using Throughout-type Faraday Cup: Simulation and Experimental Analysis	Ecole Normale Supérieure de Bechar
19:30-19 :45	ID 40	Bouchikhi Nasreddine	Impact of Distributed Generation Placement and Sizing on Short-Ciruit Levels in Radial Distribution Networks	University of Setif 1
19:45 - 20:00	ID 135	Lahrech Abdelhakim	Thermal Performance Evaluation of a Tri-Nanofluid in a Water–Ethylene Glycol Base Fluid: Analysis of Heat Transfer, MHD Flow, and Double-Diffusive Convection in a Porous Medium under Thermal Non-Equilibrium and Joule Heating effect	University of Bordj Bouarreridj

- **Virtual Poster (Off line)**

ID	Author	Title	Establishment
Chairs : Dr. Abderrahim ZEMMIT & Dr. Abdelghafour Herizi & Dr. Riyadh ROUABHI			
195	Abderrahmane BENAISSA	Comparative Study of Current Ripple and Efficiency in Interleaved and Conventional Boost Converters for Photovoltaic Energy Integration	University of Djelfa
159	Abderrahmane BENAISSA	Bidirectional Energy Transfer for Electric Vehicles: A V2G/G2V Converter System	University of Djelfa
21	Chehda Rabeh	Discrimination between inter-turn short-circuit and eccentricity faults in SRM using real and imaginary components of stator current spectral analysis	University of Tiaret
174	Grine Madani	Ab-initio study of the optoelectronic properties of ZnX for use in renewable energy, such as photovoltaic cells	University of M'Sila
92	Mohamed Boudiaf Koura	Enhanced Diagnosis of Rotor Faults in Induction Motors Using Adjustable Window Function	University of Tiaret
151	ZOUGHAB Samir	An efficient control based on VSS-P&O MPPT technique for a Standalone Photovoltaic Water Pumping System Using a PMDC Motor	University of Setif 1
58	LATRECHE Abderrezzak	Hybrid Renewable Sources Implementation for a DC Microgrid with MPPT Fuzzy Logic Control	University of Tamanghasset
199	LATRECHE Abderrezzak	Simulation of a Hybrid Fuel Cell and Battery Storage System in MATLAB	University of Tamanghasset
101	Lakhdar MADANI	Analysis of the impact of wind turbine integration on system security and protection planning	University of Setif 1
106	Mammi Mounira	Elaboration and Characterization of Doped NiO Thin Films Prepared by Spray Pyrolysis and Their Application in Gas Sensor Devices	University of El Oued
67	Mohammed Boukhari	Field-Oriented Control of Dual Front-Wheel Motors in Electric Vehicles	University of M'sila
77	MOKHTARI Rida	Real-Time Attitude Control of a Quanser Quadrotor Using Finite-time Algorithm and Quaternion Representation	école supérieur en sciences appliquées de Tlemcen
33	Ayyoub Zeghlache	Super-Twisting Sliding Mode Observer and Extended State Observer Comparison in PMSM Sensorless Control	University of M'sila
192	Zine elabadine Dahmane	Vehicle-to-Grid (V2G) Integration for Balancing Renewable Energy Supply	University of USTHB
230	MOKHTARI Rida	Autonomous Flight Control Systems for Small Coaxial Rotor UAVs	école supérieur en sciences appliquées de Tlemcen

جامعة محمد بوضياف - المسيلة
Université Mohamed Boudiaf - M'sila

NC-REAEE'25

LGE
laboratoire de génie électrique