People`s Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
University of El Oued
Faculty of Technology
Under the supervision of
DGRSDT - The Directorate-General for Scientific Research and Technological Development
Organize
International Pluridisciplinary PhD Meeting (IPPM'23)

2nd Edition, December 11-13, 2023
Artificial Intelligence (AI) Revolution:
Challenges, Prospects and Ethical Aspects
Theme: Artificial Intelligence (AI) and its Applications in Engineering

Honorary Chairman
Pr. Mohamed BOUHICHA, Rector of DGRST, Algeria
General Chairman
Pr. Omar FERHATI, University of El Oued, Algeria
Organization Chairman
Pr. Mansour BOUBEKEUR, PG-Vice-Rector, University of El Oued, Algeria
Sponsorship Chair
Pr. El-Habib GUEDDA, RELEX-Vice-Rector, University of El Oued, Algeria

Chairman
Dr. Meneceur Redha, University of El Oued, Algeria
Dr. Chemsa Ali, University of El Oued, Algeria

Technical program Chairman
Dr. HIMA Abdelkader, University of El Oued, Algeria
Dr. KHELIL Abdellatif , University of El Oued, Algeria

Organizing Committee Chair
Dr. MENECEUR Noureddine, University of El Oued, Algeria
Dr. AJGOU Riadh, University of El Oued, Algeria
Dr. OUAKOUK Abdelkader, University of El Oued, Algeria
Dr. RADJEB Youcef, University of El Oued, Algeria

Scientific & Technical Program Chair
Pr. BEKAKRA Youcef, University of El Oued, Algeria
Dr. BOUKHARI Ali, University of El Oued, Algeria
Dr. MILOUDI Abdelmonem, University of El Oued, Algeria
Pr. BEN MYA Omar, University of El Oued, Algeria

Workshop 1: On AI-Based Applications for Smart Grids in Smart Cities

By Prof. Youcef SOUFI, Tebessa Univ.

The rise of smart cities has led to the development of smarter, more efficient energy systems. Smart grids are an essential component of these systems, providing a network for the distribution and management of electricity. With the increasing use of artificial intelligence (AI) in engineering applications, there is growing interest in the use of AI-based applications for smart grids in smart cities. AI-based applications can help improve the efficiency, reliability, and sustainability of smart grids by predicting energy demand, optimizing energy generation and storage, and minimizing energy waste. For example, machine learning algorithms can be used to analyse large amounts of data from smart grid sensors and predict energy demand patterns, enabling utilities to adjust energy supply accordingly. In addition, AI can be used to optimize the performance of energy storage systems, such as batteries and capacitors, by predicting their state of charge and the best time to charge and discharge them. This can help minimize energy waste and reduce the cost of energy for consumers. The use of AI-based applications for smart grids in smart cities is an exciting area of research and development, and it has the potential to transform the way we manage and use energy.

Workshop 2: Harvesting AI-Coupled Tools with ANSYS CFD

By PhD. Abdelhaq KEDDOUDA, M'sila Univ.

In today's world, the use of artificial intelligence (AI) is becoming increasingly popular in various fields. In particular, the combination of AI and computational fluid dynamics (CFD) tools is a powerful approach for solving complex fluid flow problems. ANSYS CFD software is one of the leading tools in this area, providing accurate simulations of fluid behavior in a wide range of applications. By coupling AI algorithms with ANSYS CFD, engineers can harvest the full potential of these tools to optimize designs and reduce development times. This approach allows for the analysis of large amounts of data, enabling engineers to identify design flaws and make improvements. In summary, harvesting AI-coupled tools with ANSYS CFD is a powerful way to enhance engineering design, and it is expected to become even more prevalent as AI continues to develop and improve.

Workshop 3: AI-Based Renewable Energy Applications in Mechanics: A Case Study

By Dr. Ali BOUKHARI, El-Oued Univ & PhD. Abdelhaq KEDDOUDA, M'sila Univ.

Renewable energy technologies have gained tremendous momentum in recent years, and they are playing a significant role in mitigating climate change. Artificial intelligence (AI) is an emerging technology that has the potential to transform the renewable energy sector. In particular, AI-based applications can help improve the efficiency, reliability, and cost-effectiveness of renewable energy systems. This case study focuses on the application of AI in the field of mechanics to enhance the performance of renewable energy systems. By analyzing data

from a solar panel installation, the researchers were able to optimize the system's output through the use of AI algorithms. The results showed that the AI-based system was able to increase the energy yield of the solar panels by up to 20%. This demonstrates the potential for AI to be used in renewable energy applications, especially in the field of mechanics. As the world continues to move towards a more sustainable future, the use of AI-based technologies is likely to become increasingly prevalent.

Workshop 4: Implementation of Faults Diagnosis Algorithms Based on Artificial Intelligence Techniques for Power Electronics Converters
By Dr. Hamza MESAI AHMED, El-Oued Univ.

Power electronics converters are an essential component of many electrical systems. They are used to convert electrical power from one form to another, and their performance is critical for the proper operation of the entire system. However, faults can occur in these converters, leading to performance degradation or even failure. Traditional fault diagnosis methods can be time-consuming and labour-intensive, making them less efficient in modern industrial applications. This is where artificial intelligence (AI) techniques can play a significant role. AI-based algorithms can be used to diagnose faults in power electronics converters quickly and accurately. This can help minimize downtime and reduce the cost of maintenance. The implementation of faults diagnosis algorithms based on AI techniques is an exciting area of research, and it has the potential to revolutionize the way we monitor and maintain power electronics converters. By using machine learning algorithms, neural networks, and other AI-based techniques, it is possible to detect faults and predict their development before they lead to system failures. This technology is becoming increasingly prevalent in industrial applications, and it is expected to play a vital role in the development of smart factories and the Industrial Internet of Things (IIoT).

Workshop 5: Implementation of Advanced control systems based on AI techniques for Power Electronics Converters Using Embedded Development Boards.
By Dr. Chouaib LABIOD, and Dr. Hamza MESAI AHMED, El-Oued Univ.

The implementation of advanced control systems using artificial intelligence techniques has the potential to improve the performance and efficiency of power electronics converters. By leveraging embedded development boards, these control systems can be integrated into the converter hardware, allowing for real-time and adaptable control. This approach has the potential to address several challenges in power electronics, such as improving power quality. This workshop will cover advanced techniques for power electronics and control system design, with a focus on utilizing various embedded development boards, gate drivers, sensors, and artificially intelligent systems.

Python Programming in Scientific Computing
By Prof. Abdelmalek ATIA, El-Oued Univ.

Python is a high-level programming language that has become increasingly popular in scientific computing. It is a versatile language that is easy to learn and use, and it provides a broad range of libraries and tools for scientific computing. In particular, Python is well-suited for numerical calculations, data analysis, and visualization. With the help of Python libraries such as NumPy, SciPy, Matplotlib, and Pandas, scientists and engineers can easily perform complex scientific computations. Python's ease of use and flexibility make it an attractive option for scientific computing, even for those with little to no programming experience. Additionally, the open-source nature of Python means that there is a vast community of developers who have created and contributed to many useful scientific computing libraries. Python programming in scientific computing is becoming more prevalent in academia, research, and industry. It is an excellent tool for accelerating research, improving data analysis, and creating interactive visualizations.

Comsol Multiphysics Energetic Calculations Related to Some AI Techniques
By Dr. NourEddine MENECEUR, and PhD. ImadEddine BOUAZIZ, El-Oued Univ.

Comsol Multiphysics is a powerful computational tool for modeling and simulating physical systems in multiple engineering fields. In particular, it is widely used in energy calculations to optimize the performance of energy systems. With the increasing use of artificial intelligence (AI) in engineering applications, Comsol Multiphysics is being used in combination with AI techniques to further enhance energy calculations. The use of AI in Comsol Multiphysics energetic calculations involves the application of machine learning algorithms and neural networks to identify patterns and predict the behavior of energy systems. This approach can improve the accuracy of energy calculations and enable more efficient design optimizations. In addition, the use of AI techniques in Comsol Multiphysics can help identify previously unknown relationships between variables that can lead to the discovery of new optimization strategies. This is an exciting area of research and development, and it is expected to play a critical role in the optimization of energy systems in the future. With the combination of Comsol Multiphysics and AI techniques, engineers can take full advantage of the capabilities of these tools to achieve improved performance and efficiency in energy systems.

Application of Artificial Intelligence in Renewable Energy and Smart Grid
By Prof. Djilani Ben attous, El Oued Univ. + Dr. Yacine Labbi and Dr. Abdelmalek Gacem.

With electricity market reform and the application scenarios of renewable energy and power demand response, the power system presents the characteristics of openness, uncertainty and complexity. The construction and application of smart power grid have become a trend. The application of artificial intelligence (AI) in smart grid provides powerful technical support for digital power network. Scenarios of AI in smart grid include power supply, power system

optimization, power user behaviour analysis, fault diagnosis, etc. Although the application of AI in the smart grid faces many problems, such as insufficient data sample accumulation, insufficient reliability, imperfect infrastructure, lack of special algorithm for power industry, etc., on the whole, AI is a powerful tool to push smart grid into the new generation of power systems and energy networks.

Workshop 9: Control System and Power Electronics using Artificial Intelligence
By Pr. Laid Zellouma, El Oued Univ. + Pr. Youcef Bekakra + Mr. Idriss Baba Arbi

Artificial intelligence (AI) in control system and power electronics build on the existing foundation of digital power and represent the next step in the evolution of power converter design, control, and optimization. Just as digital power enables more complex control algorithms than analog control techniques, AI will allow even more complex and dynamic non-linear control surfaces to enhance efficiency, reliability predictions, and health monitoring in power converters.

Workshop 10: Application of Artificial Intelligence in Telecommunications, Image and signal Processing
By Pr. Riyadh Ajgou, El Oued Univ. + Dr. Messaoud Hittiri + Dr. Abdelatif Khelil + Dr. Said Ghendir

The aim of the International Pluridisciplinary PhD Meeting named IPPM'23 designated to PhD students is to provide a forum for researchers to present new ideas and contributions in the form of technical papers, panel discussions as well as real-world evaluation of many ideas for application of artificial intelligence in telecommunications, images and signal processing employed. The second edition will bring together various developers to discuss technical challenges, standards, fundamental issues, and future services and applications. All full paper submissions will also be peer reviewed and evaluated based on originality, technical and/or research content, correctness, relevance to conference, contributions, and readability. High level professors will provide plenary sessions on the progress in the field. The full paper submissions will be accepted based on technical merit, interest, applicability, and how well they fit a coherent and balanced technical program.

FES Meeting contact
Email:
IPPM23-ST@univ-eloued.dz
FES submission website

International Pluridisciplinary PhD Meeting IPPM23 (faculty of Technology) - Sciencesconf.org

Scientific Committee

Full name	University, Institution
Pr. Zied Driss	University of Sfax, Tunisia
Pr.Youcef Soufi	University of Tebessa, Algeria
Pr. Said Bouabdallah	University of Laghouat, Algeria
Pr. Hocine Benmoussa	University of Batna 2, Algeria

Pr. Boubaker Benhaoua	University of El Oued, Algeria
Pr. Abdelmouméne Hakim Benmachiche	University of Biskra, Algeria
Pr. Med Elhadi Attia	University of El Oued, Algeria
Pr. Youcef Bekakra	University of El Oued, Algeria
Dr. Ali Boukhari	University of El Oued, Algeria
Dr. Meneceur Ridha	University of El Oued, Algeria
Dr. Ramzi Mdouki	University of Tebessa, Algeria
Dr. Fouad Menasria	URERMS Adrar, Algeria
Dr. Mabrouk Guestal	University of Tebessa, Algeria
Dr. Ridha Mebrouk	University of Ouargla, Algeria
Dr. Salim Boulahrouz	University of Khenchela, Algeria
Dr. Noureddine Meneceur	University of El Oued, Algeria
Dr. Med Tahar Gherbi	University of El Oued, Algeria
Dr. Mohammed Khechana	University of El Oued, Algeria
Dr. Djilani Necib	University of El Oued, Algeria
Dr. Med Ilyas Boulifa	University of El Oued, Algeria
Dr. Yacine Aoun	University of El Oued, Algeria
Dr. Mansouri Khaled	University of El Oued, Algeria
Dr. Chouaib Labiod	University of El Oued, Algeria
Dr. Mesbah Laouamer	University of El Oued, Algeria
Dr. Hamza Mesai Ahmed	University of El Oued, Algeria
Dr. Abdelkader Mahmoudi	University of El Oued, Algeria
Dr. Abderrahmane Khechekhouche	University of El Oued, Algeria
Dr. Abdelkrim Mohrem	University of El Oued, Algeria
Dr. Bachir Zine	University of El Oued, Algeria
Dr. Ossama Zobiri	University of El Oued, Algeria
Pr.Youcef Soufi	University of Tebessa, Algeria
Pr. Djilani Ben attous	University of El Oued, Algeria
Pr. Abdelkarim Allag	University of El Oued, Algeria
Pr. Ferhat, Rehouma	University of El Oued, Algeria
Pr. Zellouma Laid	University of El Oued, Algeria
Pr. Zoheir Tir	University of El Oued, Algeria
Pr. Nadhir Mesbahi	University of El Oued, Algeria
Pr. Riadh Ajgou	University of El Oued, Algeria
Pr. Youcef Bekakra	University of El Oued, Algeria
Pr. Kemal Srairi	University of Biskra, Algeria
Pr. Toufik Mohammed Ben chouia	University of Biskra, Algeria
Dr. Abdelatif Khelil	University of El Oued, Algeria
Dr. Messaoud Hittiri	University of El Oued, Algeria
Dr. Said Ghendir	University of El Oued, Algeria
Dr. Abdelkader Hima	University of El Oued, Algeria
Dr. Ali Chemssa	University of El Oued, Algeria
Dr. Abderahim Allal	University of El Oued, Algeria
Dr. Noureddine Bessous	University of El Oued, Algeria
Dr. Lazhar BOUGOUFFA	University of El Oued, Algeria
Dr. Yacine Labbi	University of El Oued, Algeria

Dr. Talal Guia	University of El Oued, Algeria
Dr. Slimane Touil	University of El Oued, Algeria
Dr. Ali Kechekhouche	University of El Oued, Algeria
Dr. Lammouchi Zakaria	University of El Oued, Algeria
Dr. Hicham Serhoud	University of El Oued, Algeria
Dr. Redha Kechida	University of El Oued, Algeria
Dr. Guediri Abdelkarim	University of El Oued, Algeria
Dr. Noura Halem	University of El Oued, Algeria
Dr. Tedjani Mahni	University of El Oued, Algeria
Dr. Chikha Said	University of El Oued, Algeria
Dr. Amina Tedjani	University of El Oued, Algeria
Dr. Fatma Zohra Tria	University of El Oued, Algeria
Dr. Meriem Allag	University of El Oued, Algeria
Dr. Ismail Laib	University of El Oued, Algeria
Dr. Ali Sadoun	University of El Oued, Algeria
Pr. Jalel Ben Othman	University of Paris 13, France
Pr. Mohamed Djemai	Polytechnic University of Hauts-de-France,Valenciennes, France
Pr. Monji Kherallah	University of Sfax, Tunisia
Pr. Abdeldjalil Ouahabi	University of Tours, France
Pr. Abdelmalik Taleb Ahmed	University of Valenciennes, France
Pr. Ahmed Chaouki Megherbi	University of Biskra, Algeria
Pr. Abida Toumi	University of Biskra, Algeria
Pr. Zitouni Athmane	University of Biskra, Algeria
Pr. Slimane Benmahmoud	University of M'sila, Algeria
Dr. Elhadi Meftah	University of Chlef, Algeria
Pr. Salim Sbaa	University of Biskra, Algeria.
Pr. Abdelkrim Ouafi	University of Biskra, Algeria
Pr. Abdelmalik Ouamane	University of Biskra, Algeria
Pr. Salim Abdesselam	University of Biskra, Algeria
Dr. Djamel Samai	University of Ouargla, Algeria
Pr. Zine Eddine Baarir	University of Biskra, Algeria
Pr. Djeffal Abdelhamid	University of Biskra, Algeria
Pr. Mohamed redouane Kafi	University of Ouargla, Algeria
Prof. Omar BEN MYA	University of El Oued, Algeria
Prof. Salaheddine LAOUINI	University of El Oued, Algeria
Dr. Mohammed Tayeb OUCIF KHALED	University of El Oued, Algeria
Dr. Mohammed Fouad FERHAT	University of El Oued, Algeria
Dr. Hadia HEMMAMI	University of El Oued, Algeria
Dr. Souheila MENACEUR	University of El Oued, Algeria
Dr. Mohammed Yazid BELGHIT	University of El Oued, Algeria
Dr. Issam BOUDOUH	University of El Oued, Algeria
Dr. Moussa BOUDIAF	University of El Oued, Algeria
Dr. Mohammed Larbi BEN AMOR	University of El Oued, Algeria
Dr. Hanane FODIL	University of El Oued, Algeria

Prof. GHOMRI Ali	University of El Oued, Algeria
Prof. HAMDI Noureddine	University of Gabes, Tunisia
Prof. KHECHANA Salim	University of El Oued, Algeria
Prof. BALI Mahmoud	University of Gabes, Tunisia
Prof. FADEL Ammar	University of Biskra, Algeria
Dr. GASMI Aicha	University of Gabes
Dr. OUAKOUAK Abdelkader	University of El Oued, Algeria
Dr. YAHIAOUI Khemissi	University of El Oued, Algeria
Dr. MEZIANI Assia	University of El Oued, Algeria
Dr. BOUCHEMAL Fattoum	University of El Oued, Algeria
Dr. HACHEMI Ali	CRSTRA Biskra, Algeria
Prof. SAKAA Bachir	CRSTRA Biskra, Algeria
Dr. HAFNAOUI Mohamed Amine	CRSTRA Biskra, Algeria
Dr. HECINI Lynda	CRSTRA Biskra, Algeria
Pr. KATEB Samir	University of Ouargla, Algeria
Pr. BOUSELSAL Boualem	University of Ouargla, Algeria
Dr. MILOUDI Abdelmonem	University of El Oued, Algeria
Dr. Baouia Kais	University of Ouargla, Algeria
Dr. ZAIR Najet	University of El Oued, Algeria
Dr. MEGA Nabil	University of El Oued, Algeria
Dr. KHATER Ibtissem	University of El Oued, Algeria
Dr. MANI Mohammed	University of El Oued, Algeria
Dr. DJEDID Tarek	University of El Oued, Algeria
Dr. LOGBI Abdelaziz	University of El Oued, Algeria
Prof. GUETTALA Abdelhamid	University of Biska, Algeria
Prof. TAALLAH Bachir	University of Biskra, Algeria
Prof. BELACHIA MOULOUD	University of Guelma, Algeria
Pr. KRIKER Abdelouahed	University of Ouargla, Algeria
Pr. NOUAOUERIA Mohammed Salah	University of Guelma, Algeria
Dr. MELAIS Fatma Zohra	University of Annaba, Algeria
Dr. AIDDOUD Assia	University of Guelma, Algeria
Dr. BOUMAAZA Messouda	University of Guelma, Algeria
Dr. KAAB Mohamed Zoheir	University of El Oued, Algeria
Dr. LABIODH Bachir	University of El Oued, Algeria
Dr. BEDADI Laid	University of El Oued, Algeria
Dr. SOULIMANE Ilyas	University of El Oued, Algeria
Dr. AOUADJ Abdelfettah	University of El Oued, Algeria
Dr. TIOUA Tahar	University of Mila, Algeria
Dr. KHELAIFA Hamad	University of El Oued, Algeria

Organizing Committee

Full name	University
Mr. Houssam Guia	University of El Oued, Algeria
Mr. Ali Zine	University of El Oued, Algeria
Mr. Abdeljalil Laouini	University of El Oued, Algeria

Mr. Seif Eddine Bousbia Salah	University of El Oued, Algeria
Mr. Khaled Miloudi	University of El Oued, Algeria
Mr. Guerfi Youcef	University of El Oued, Algeria
Mrs. Houda Berkane	University of El Oued, Algeria
Mrs. Soulef Largot	University of El Oued, Algeria
Mrs. Assia Meziane	University of El Oued, Algeria
Mr. Abdelhak Keddouda	University of M'sila, Algeria
Mr. Khalil Deghoum	University of El Oued, Algeria
Mrs. Nacima Oubouzid	University of El Oued, Algeria
Mr. Ali bebboukha	University of El Oued, Algeria
Mr. Imadeddine Bouaziz	University of El Oued, Algeria
Mr. Lalmi Rahmani	University of El Oued, Algeria
Mr. Alaa Eddine Djoughrab	University of El Oued, Algeria
Mr. Idris Baba Arbi	University of El Oued, Algeria
Mr. Ridha Touhami	University of El Oued, Algeria
Mr. Oussama Maamri	University of El Oued, Algeria
Mr. Azzeddine Merrazga	University of El Oued, Algeria
Dr. Laid ZEGHOUD	University of El Oued, Algeria
Dr. Abdelghani SEROUTI	University of El Oued, Algeria
Dr. Djamel BARANI	University of El Oued, Algeria
Dr. Abdelmadjid GUERRAM	University of El Oued, Algeria
Dr. Youcef REDJEB	University of El Oued, Algeria
Dr. Bilel KHALED	University of El Oued, Algeria
Dr. Abdealaziz BOUHOREIRA	University of El Oued, Algeria
Dr. Nassyma LAMY	University of El Oued, Algeria
Dr. Abdessalam BOUGHEZAL	University of El Oued, Algeria
Dr. Ilhem BEN AMOR	University of El Oued, Algeria
Dr. Chaima SALMI	University of El Oued, Algeria
Dr. Mohammed HAMDI ALI	University of El Oued, Algeria
Dr. Hasan GAMIL GAMAL	University of El Oued, Algeria
Dr. OUAKOUAK Abdelkader	University of El Oued, Algeria
Dr. MILOUDI Abdelmonem	University of El Oued, Algeria
Dr. MEGA Nabil	University of El Oued, Algeria
Dr. GHOMRI Ali	University of El Oued, Algeria
Dr. MEZIANI Assia	University of El Oued, Algeria
Dr. KHECHANA Salim	University of El Oued, Algeria
Dr. BOUCHEMAL Fattoum	University of El Oued, Algeria
Dr. ZAIR Nadjet	University of El Oued, Algeria
Dr. RIGUET Ferhat	University of El Oued, Algeria
Dr. SAYAH LEMBAREK Mohamed	University of El Oued, Algeria
Dr. KHATER Ibtissem	University of El Oued, Algeria
Dr. YAHIAOUI Khemissi	University of El Oued, Algeria
Mme. MEGUELLATI Soumaia	University of El Oued, Algeria
Dr. MANI Mohammed	University of El Oued, Algeria
Dr. DJEDID Tarek	University of El Oued, Algeria
Dr. LOGBI Abdelaziz	University of El Oued, Algeria

Dr. KAAB Mohamed Zoheir	University of El Oued, Algeria
Dr. LABIODH Bachir	University of El Oued, Algeria
Dr. BEDADI Laid	University of El Oued, Algeria
Dr. SOULIMANE Ilyas	University of El Oued, Algeria
Mr. FARIK Ali	University of El Oued, Algeria
Mr. MASMOUDI Faouzi	University of El Oued, Algeria
Mme. HACHEM Rafika	University of El Oued, Algeria
Mme. HOUIDI Karima	University of El Oued, Algeria
Dr. AOUADJ Abdelfettah	University of El Oued, Algeria
Dr. TIOUA Tahar	University of Mila, Algeria
Dr. FETHIZA ALI Boubaker	University of El Oued, Algeria
Dr. KHELAIFA Hamad	University of El Oued, Algeria
Mr. ZERIG Tahar	University of El Oued, Algeria
Mr. KHELIFI Abdelhamid	University of El Oued, Algeria
Mr. YOUSFI Mohammed Lamine	University of El Oued, Algeria