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RDI

Research | Development | Innovation

Annual Report

2023-2024 Academic year

“At ESPRIT, we continue to uphold our priority to impactful research aligned with the United Nations Sustainable Development Goals (SDGs), while embracing emerging opportunities to drive innovation and societal progress. Our recently launched AI strategy places AI-driven research with impact at the heart of our institutional vision, reflecting our determination to pioneer advancements that address real-world challenges.

This year, we were honored to host the 20th CDIO International Conference, held from June 10 to 13, 2024. This milestone underscored our dedication to fostering global collaboration in engineering education and further cemented our position as a hub for innovation and excellence.”

Professor Tahar Ben Lakhdar, ESPRIT CEO and Co-founder

Contents

ESPRIT-Tech

The Research, Development, and Innovation Office

Welcome

Research, Development, and Innovation (RDI) have been integral pillars of ESPRIT's strategy since its founding. In 2010, we took a significant step forward by establishing ESPRIT-Tech, our dedicated RDI office, which has since been instrumental in orchestrating and driving a wide range of research activities. This division actively engages stakeholders to define and implement robust research policies, strategies, and priorities.

At ESPRIT, we are deeply committed to applied research and innovation, focusing on initiatives that deliver tangible socio-economic benefits while maintaining a strong appreciation for the importance of fundamental academic research.

This year, we observed a surge in the number of research publications, largely driven by the remarkable engagement of our faculty at the CDIO 2024 Conference, hosted at ESPRIT, which yielded an impressive total of 34 publications. This success underscores the symbiotic relationship between teaching and research, as our faculty actively leverage pedagogical innovation practices, Generative AI and Large Language Models to transform the way students learn and faculty teach, thus driving innovation and academic excellence.

This catalog serves as an invitation to explore the diverse spectrum of RDI activities, events, initiatives, and achievements that define ESPRIT's innovative spirit.

We look forward to building new collaborative partnerships across the local community, private enterprises, and public sectors. Such strategic alliances are pivotal to reinforcing ESPRIT's role as a driver of progress and laying the foundation for an even greater contribution to Tunisia's socio-economic development.

Welcome to a catalog that celebrates the transformative power of research, innovation, and collaboration.

Prof. Faouzi Kamoun
Director ESPRIT-Tech
Tel: (216) 99 423 944
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Research Teams

#	Name	Domain	Coordinator	Contact Email address
Information & Communications Technologies (ICT)				
1	ESPRIT-Cloud	Cloud Computing & Security	Manel Madhioub & Soumaya Mbarek	Manel.madhioub@esprit.tn soumaya.mbarek@esprit.tn
2	Wireless Com	Wireless communications	Safa Zhioua Cherif	safa.zhiouacherif@esprit.tn
3	M2M	Ambient & embedded systems	Feten Teber	Feten.teber@esprit.tn
4	WSN-RFID	Wireless sensor networks and RFID	Abderrazak Hachani	Abderrazak.hachani@esprit.tn
5	ESPRIT-Mobile	Mobile applications	Imed Amri	Imed.amri@esprit.tn
6	DASC	Data Science & AI	Sami Sifi	Sami.sifi@esprit.tn
7	Imagin	Computer vision / image processing	Wissal Neji	wissal.neji@esprit.tn
8	I2S	Intelligent Information Systems	Syrine Karoui	Syrine.karoui@esprit.tn
9	SSD	Sustainable social development	Soumaya Argoubi	Soumaya.argoubi@esprit.tn
10	Esprit SmartNet	Smart Networks (SDN, NFV, AI)	Amel Ksentini	amel.ksentini@esprit.tn
	Electromechanical & Industrial Engineering			
11	ICAR	Robotics	Maher Mkhinni	Maher.mkhinni@esprit.tn
12	EVIS	Electric vehicle innovation systems	Toufik Chaouachi	Taoufik.chaouach@esprit.tn
13	INOBI	Industrial engineering for a better life	Salah Bousbia	Salah.bousbia@esprit.tn
14	ETM	ESPRIT's Tomorrows Materials	Ameni Ellouze	Ameni.ellouze@esprit.tn
15	ISF	Integrated Smart Factory	Yosr Ghozzi	Yosr.ghozzi@esprit.tn
Civil Engineering				
16	REEE	Renewable energy & energy efficiency	Imen Guebebia	Imen.guebebia@esprit.tn
17	SBM	Smart Building management	Asma Karaoui	Asma.karoui@esprit.tn
Applied Mathematics				
18	GRAFICS	Risk management	Mohamed Anis Ben Lasmar	Mohamedanis.benlasmar@esprit.tn
19	MMSN	Mathematical modeling and numerical simulations	Mohamed Hedi Riahi	Mohamedhedi.riahi@esprit.tn
Management & Pedagogical Innovation				
20	MAIN' Team	Management & Innovation	Inés Mhaya	Ines.mhaya@esprit.tn
21	ALEER	Engineering Education Research	Lamjed Bettaieb	Lamjed.bettaieb@esprit.tn
22	FLE	Foreign Language Education (FLE)	Thameur Cherni	thameur.cherni@esprit.tn
23	DevProfE	Développement professionnel des enseignants	Hajer Berhouma	hajer.berhouma@Esprit.tn

Research Themes

#	Research Team	Research Themes
1	ESPRIT-Cloud	⇒ Infrastructure as a service ⇒ Virtualization technologies ⇒ Cloud security ⇒ Cloud federations ⇒ Platform as a service ⇒ Learning-based Cloud
2	Wireless Com	⇒ Future Wireless Networks ⇒ UAV-based Aerial Networks ⇒ Smart agriculture (UAVs & AI) ⇒ Wireless communication for Public Safety ⇒ E-health
3	M2M	⇒ Healthcare ⇒ Smart homes ⇒ Smart agriculture
4	WSN-RFID	⇒ Design of interconnected objects ⇒ Digital Transformation ⇒ Localization and tracking ⇒ Logistic management ⇒ IoT applications
5	ESPRIT-Mobile	⇒ IoT ⇒ Blockchain ⇒ M-Health ⇒ Augmented Reality / AR ⇒ Virtual Reality / VR & Mixed Reality / MR
6	DASC	⇒ Machine Learning & AI applications ⇒ Social media data analytics ⇒ Education 4.0 ⇒ Risk Cartography
7	ImageIn	⇒ Machine learning for computer vision ⇒ Medical imaging ⇒ Shape recognition ⇒ Image processing
8	I2S	⇒ Intelligent Information Systems (IIS) architectures ⇒ IIS security ⇒ Decision-support systems ⇒ Big data & AI for IIS ⇒ DevOps for IIS
9	SSD	⇒ Behavioral Analysis ⇒ Privacy ⇒ Serious Games ⇒ E-justice: Social development to achieve peace, human rights, and effective governance ⇒ Sustainability in Engineering Education
10	Esprit SmartNet	⇒ Software-Defined Networking (SDN) ⇒ Network Functions Virtualization (NFV) ⇒ AI & Network slicing ⇒ Optimization of next-generation networks

#	Research Team	Research Themes
11	ICAR	⇒ Automation and Robotics ⇒ MEMS and IoT applied for mechatronics
12	EVIS	⇒ Vehicle's mechanical structures ⇒ Vehicle's aerodynamics ⇒ Electric power converters ⇒ Battery charging and management systems
13	INOBI	⇒ Innovative pedagogical approaches for industrial engineering education ⇒ Industrial engineering solutions for social innovation and better life
14	ETM	⇒ Valorization of waste in plastic/composite materials ⇒ Valorization of natural fibers resulting from their use as reinforcement in composite materials ⇒ New ecological concretes made with carbonated aggregates
15	ISF	⇒ Immersive environments for manufacturing innovation ⇒ Innovation and technology transfer engineering
16	REEE	⇒ Energy audit ⇒ Energy management and optimization ⇒ Sustainable development & Smart cities
17	SBM	⇒ Methods to improve occupant comfort ⇒ Smart building applications ⇒ Building Information Modelling (BIM)
18	GRAFICS	⇒ Data Mining, Scoring and Big data tools for decision support and actuarial applications ⇒ Efficient algorithms for stochastic control, numerical and statistical processing ⇒ Sensitivity analysis, quantification of uncertainty, and uncertainty modeling ⇒ Rare events analysis for optimal decision making and risk management
19	MMSN	⇒ Applications of mathematical models and simulation techniques: ⇒ Finance: Inverse problem of estimating volatility in the Black and Scholes model ⇒ Environment: Parametric estimation in hydrogeology ⇒ Oil and Gas: Numerical modeling of the impact of rock mechanics in oil reservoirs on flow in porous media ⇒ Biology: modeling electrical activities of the hearts ⇒ Civil engineering: Mixed 3D-1D formulation for the analysis of composite beams
20	MAIN 'Team	⇒ Digital Marketing & Data Marketing ⇒ Innovation management ⇒ Development economics ⇒ Business Finance ⇒ Human resources ⇒ Entrepreneurship
21	ALEER	⇒ Active learning in engineering education ⇒ Collaborative project approaches in Engineering education ⇒ Case studies in Engineering education & lessons-learned ⇒ Learning outcome assessment ⇒ Digital technologies in Engineering education
22	FLE	⇒ English for Specific Purposes ⇒ Foreign Language Anxiety ⇒ AI: The Future of Language Learning
23	DevProfE	⇒ Management of skills and talents. ⇒ Faculty professional development ⇒ Applications of AI in the analysis of training programs and trainers.

Major organized RDI events 2023-2024

20th International CDIO Conference

ESPRIT had the privilege of hosting the 20th edition of the globally renowned CDIO International conference, an event dedicated to advancing engineering education through innovation and collaboration. This year's edition was held under the theme "Engineering Education in the Era of AI" and brought together 200 participants from 26 countries worldwide.

The CDIO conference featured an impressive 126 contributions, encompassing scientific papers and interactive workshops, which highlighted innovative approaches, emerging trends, and practical solutions to challenges in engineering education in the age of artificial intelligence.

ESPRIT made a significant contribution to this edition of the conference, with the presentation of 34 research papers and the organization of 6 interactive workshops.

By hosting and contributing towards this event, ESPRIT reaffirmed its commitment to educational excellence, innovation, and global engagement, further establishing itself as a key player in shaping the future of engineering education.

AI Summer School

The third of MASSAI summer school, organized in partnership with the Tunisian Society of High-Performance Computing, the UNESCO Chair, and the Deep Learning Institute of Nvidia, was held during the period June 3 to June 7, 2024.

The event is targeted for graduate and PhD students, postdocs, academics, members of public or private institutions, and professionals.

The aim of MASSAI was twofold:

- Contribute towards the development of the African potential and stimulate entrepreneurial initiatives in the field of AI.
- Contribute to enriching the AI ecosystem in the region by providing an opportunity to foster collaboration among the different academic actors and industrial players in the AI field.

MASSAI focused on applied AI through a combination of in-depth tutorials, practical labs and instructor-led workshops.

The MASSAI 2024 edition introduced several new elements:

Tracks: Five distinct tracks including Accelerated Computing, Data Science, Generative AI and LLM Training, Edge Computing, and Deep Learning.

Workshops (With NVIDIA Certificate of Competency): Sessions on Data Parallelism with multiple GPUs, Generative AI using Diffusion Models, Efficient Data Science workflows, AI Video Applications on NVIDIA JetSon Nano, and Fundamentals of Accelerated Computing with OpenACC and CUDA Python.

Tutorials: Hands-on experiences in Prompt Engineering with LLAMA-2, LLM Augmentation with RAG, Model Deployment at Scale, Apache Spark with RAPIDS Accelerator, Zero-Code Data Science Workflows, Graph Neural Networks, and Physics-Informed Machine Learning.

Industry Insights: From real-world use cases and testimonials from the AI industry.

Additionally, the poster session featured awards in the following categories:
- Best AI for Environmental and Social Impact Poster
- Best Innovation in Generative AI Poster
- Best Applied AI Techniques Poster
- Best AI in Communications and Connectivity Poster
- Best Educational Innovation Poster (ESPRIT Special Prize)

More information about this event can be found at https://massai.esprit.tn/

Sustainable Minds Event

During the period March 1-4, 2024, the Sustainable Social Development (SSD) research team led the organization of the second edition of the Sustainable Mind Hackathon in cooperation with other research teams and faculty from ESPRIT, ESB, ISG and INSAT.

140 students from 9 different institutions took part in this hackathon and more than 30 jury members were actively engaged in the evaluation of the teams' proposals.

In addition, 4 workshops were conducted to raise awareness among students about themes pertaining to SDGs and entrepreneurship.

A panel discussion on Sustainable Development was also held during this event.

“Innovate for ADHD” Event

On October 18th 2024, the SSD RDI team led the organization of the “Innovate for ADHD” Talk event, in alignment with the UN SDG 3 “Good Health & Well-being” and SDG 4 “Quality Education”.

The event aimed to raise awareness about ADHD (Attention-Deficit/Hyperactivity Disorder), a neurodevelopmental condition characterized by persistent patterns of inattention, hyperactivity, and impulsivity that can affect daily functioning and development.

The event featured two main phases: "ADHD Talk" and "Innovate for ADHD." The initiative included interventions from invited specialists (including an occupational therapist, a psychologist, and a positive parenting coach) to provide expert insights. The event also involved collaboration with artistic clubs, including Venus and Nakcha, to enrich the experience creatively. Additionally, students shared personal testimonials to foster understanding and engagement.

Clean and Green 2

The second edition of the Clean & Green event was held on February 17th, 18th, and 21st, 2024.

"Clean and Green" is a collaborative event initiated by the ETM (Esprit Tomorrow's Material) RDI team in collaboration with the Esprit School of Engineering, Esprit School of Business, and students from the Electromechanical and Civil Engineering departments. The event showcases a successful synergy between academic experts and the dynamic student-led ESPRO JUNIOR Enterprises.

Objective

Clean and Green aimed to raise awareness among participants about environmental pollution and to empower students to become the change agents of tomorrow by trying to find innovative solutions to environmental challenges. This event also provided a forum for discussions among researchers, academics, industry stakeholders, and members of various associations to effectively address the environmental challenges.

The event consisted of three stages:

Phase 1: Clean and Green hackathon

The goal of the hackathon was to encourage our students to develop innovative solutions to address environmental pollution while applying the skills they have acquired throughout their academic studies.

Special training was offered during the hackathon on topics pertaining to Design Thinking, pitching, poster creation and video editing.

Phase 2 : Clean and Green Poster Session

This poster session provided an opportunity for students to present their proposed solutions. It facilitated discussions among all participants, including businesses and associations, and provided students with the opportunity to explore startup ventures.

Phase 3 : "Clean and Green" Awareness Day

This event aimed to raise awareness about the environmental dangers posed by waste and to educate the public on the strategies used to mitigate these risks. The event included a series of presentations and activities focused on environmental sustainability and waste management.


R&D
Awards

Research Incentive Funds

The ESPRIT Research Incentive Funds (RIF), also known as "FARDI – Fonds d'Appui à la Recherche, Développement et Innovation," was launched in 2021 as an initiative to promote and encourage research productivity and excellence.

Proposals from ESPRIT research teams are evaluated by a RIF committee composed of 4 members:

- The Director of ESPRIT-Tech (Chair)
- Three members appointed by the Director of ESPRIT-Tech

Proposals were evaluated based on four main criteria: eligibility, relevance, impact, and effectiveness of the implementation. Priority was given to multi-disciplinary applied projects that engage students and that involve the participation of local organizations and industrial partners. The maximum eligible funding is 6,000 Dinars for a 1-year project proposal and 9,000 Dinars for a 2-year proposal.

During the academic year 2023-2024, ESPRIT-Tech received 2 applications, among which one proposal was accepted for funding:

Project Title	Primary Investigators	Project Duration
"*SigneXperience*": An immersive experience for deaf Tunisian learners, based on sustainable visual pedagogy	Ons Ben Salah (**PI**) Hend Fourati (Co-PI) Abdelmonem Aissa (Co-PI) Abderrahmen Ben Arous (Co-PI)	24 months

RDI Award

In 2020, we established the RDI Award to promote and celebrate outstanding research achievements by recognizing faculty members who excelled through the diversity and quality of their research, development, and innovation (RDI) activities and contributions.

The research award for the 2023-2024 academic year was granted to ***Dr. Mohamed Hedi Riahi,*** head of the "Modélisation Mathématique et Simulation Numérique" (MMSN) RDI team.

Faculty - Ph.D candidates and graduates

During the 2023-2024 academic year, 3 ESPRIT instructors have successfully completed their PhD degree as illustrated in the table below.

Faculty name	Thesis defense date	Thesis title
Soumaya Nheri	13/12/2023	Novel Subclass One-Class Classification for Pattern Recognition.
Slimene Ines	25/06/2024	Apprentissage et classification de biomarqueurs pathologiques : les micro-ARNs (miARNs) dans le génome humain
Maha Mallek	20/12/2023	Classification de relations d'un document textuel non structuré basée sur le context

In addition, 13 faculty members are currently pursuing their PhD studies at research laboratories affiliated with public universities:

Faculty name	Thesis title
Oumayma Jouini	Aritificial Inteligence and Blochchain Solutions For Sustainable Agriculture
Safa Lasmar	Aide à la décision pour le problème de localisation et allocation des centres de dialyse
Esleme Hadj Sassi	Le délit de contrefaçon en droit international privé
NOUR AGREBI	Anxiety And Performance In Reading And Listening In English
Dorsaf HRIZI	Lung Cancer detection using AI
Ons MARZOUGUI	Étude Des Interactions Matériau- Procédé En Usinage Par Électroérosion Des Biomatériaux : "Influence Du Matériau De L'électrode-Outil
Amel HAJJI	Modélisation et amélioration de la performance des cellules manufacturiers sujettes à des perturbations aléatoires.
Zeineb, ZOUAOUI	Méthodes d'optimisation combinatoires et deep learning
Khouloud Ammar	Graph representation learning
Wiem Baazouzi	Study and proposal of a recommendation system based on the response to queries in the framework of knowledge graphs.
Jihen Hlel	Towards a Successful Digital Transformtion in an Organization
Yassine BOUSSAA	Dynamic stability of electricity networks integrating large-scale renewable energies. Koopman operator Analysis.
Yosra Jmal	Contribution à l'optimisation des performances d'un service d'urgence Hospitalier

RDI publications highlights

2023-2024 Academic Year (AY)

69 publications

53 peer-reviewed conference papers

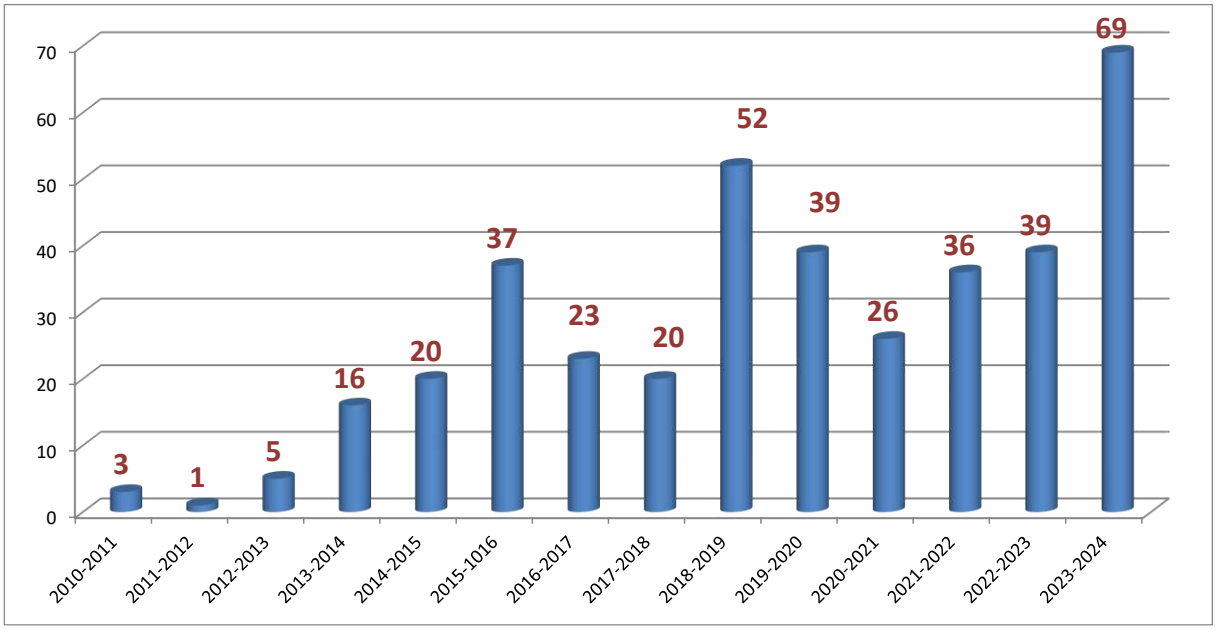
- **37** Pedagogical innovation
- **12** Information & Communications Technologies (ICT)
- **2** Electromechanical Engineering
- **2** Applied mathematics

12 peer-reviewed journal articles

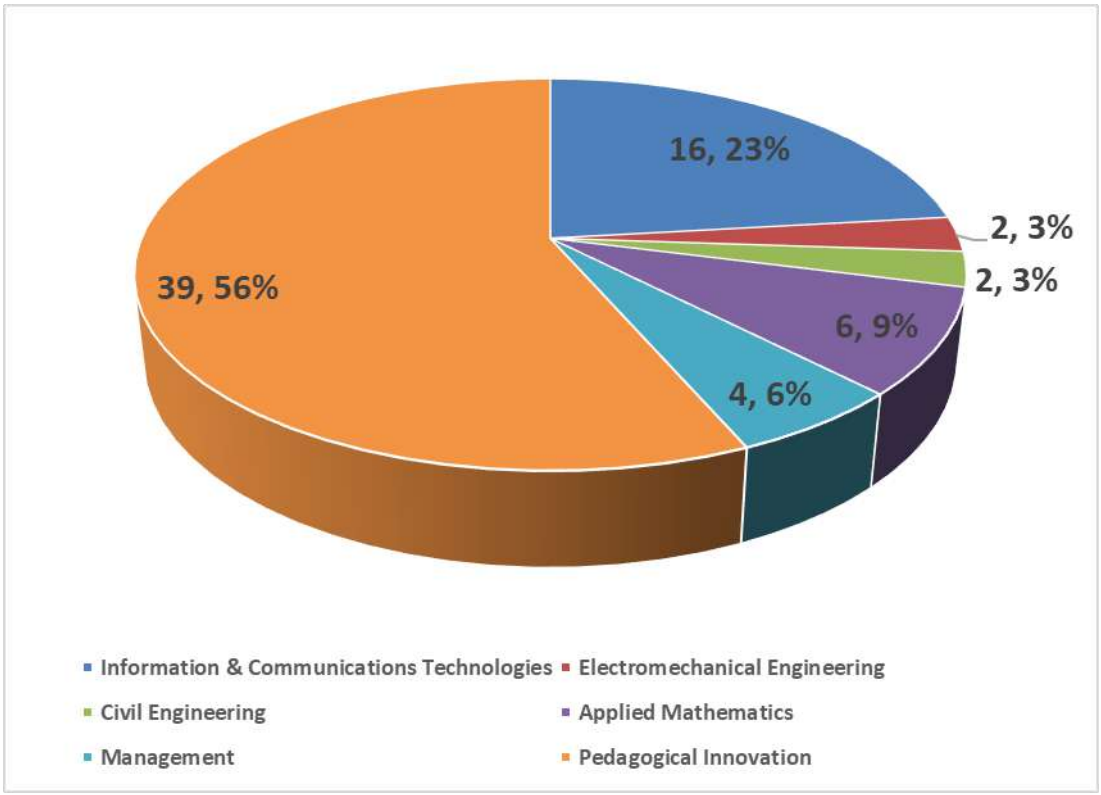
- **4** Applied Mathematics
- **3** Information & Communications Technologies (ICT)
- **2** Civil Engineering
- **2** Management
- **1** Pedagogical Innovation

4 book chapters

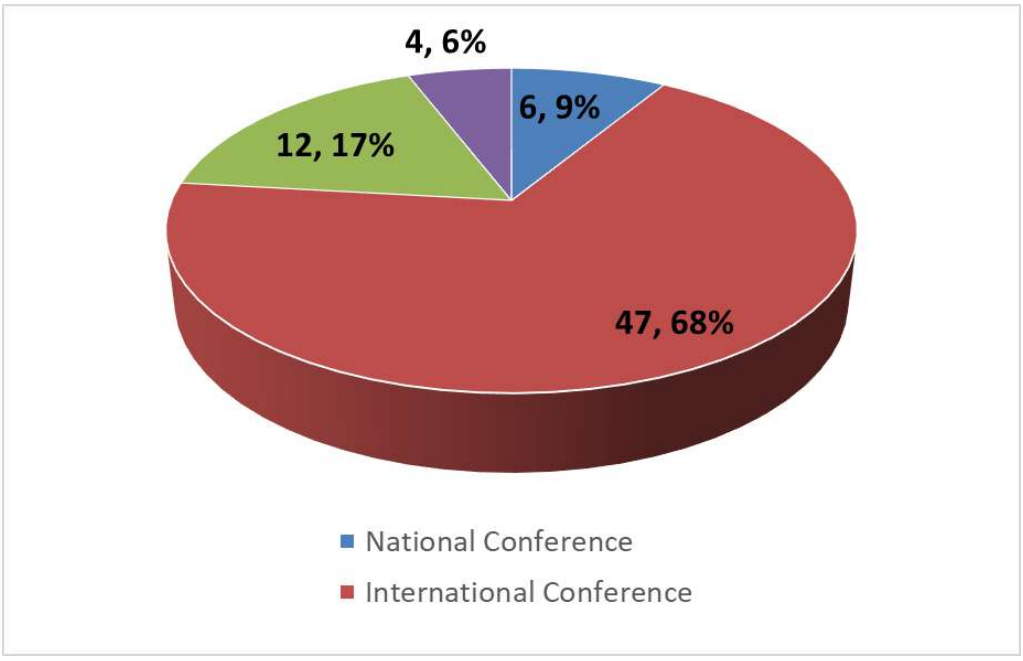
- **1** Information & Communications Technologies (ICT)
- **2** Management
- **1** Pedagogical Innovation



Evolution of the number of research publications: 2010-2024



Repartition of RDI publications by field



Repartition of RDI publications by type

According to the **AD Scientific Index** database, ESPRIT is ranked 14th at the National level and the 1st among all private higher education institutions in Tunisa with ~12,500 research citations. For more details, visit https://www.adscientificindex.com/university/ESPRIT/ .

Information & Communications Technologies

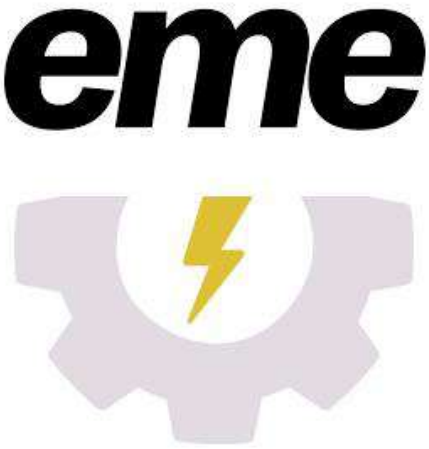
ICT RDI Publications (2023-2024 AY)

#		Type[1]
1	Kerrache, F., **Ammar, A**., Ikhlef, R., NaitAmor, S., Bouyahiaoui, Z., Daiffallah, K., ...& Shimeis, A. (2024). Observations and numerical simulations of the effects of the Gamma ray burst 221009A on the lower ionosphere. Journal of Geophysical Research: Space Physics, 129(7), e2023JA031721. https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2023JA031721	JA
2	Barnawi, Ahmed, Mehrez Boulares, and **Rim Somai**. (2023). Simple and Powerful PCG Classification Method Based on Selection and Transfer Learning for Precision Medicine Application." Bioengineering 10, no. 3 (2023): 294. https://www.mdpi.com/2306-5354/10/3/294	JA
3	**Touati, Nahla**, and Imen Saidi. (2024). Dahlin Deadbeat Internal Model Control for Discrete MIMO Systems. International journal of electrical and computer engineering systems 15, no. 6 (2024): 483-490. https://hrcak.srce.hr/317686	JA
4	**Kamoun, F**., Iqbal, F., Zeresenay, S., Khalid, Z., Ikuesan, R., & Abraham, S. (2024). Metaverse Forensics: A Preliminary Analysis of Opportunities and Challenges. Forecasting Cyber Crimes in the Age of the Metaverse, 182-208. https://www.igi-global.com/chapter/metaverse-forensics/334501	BC
5	**Baazouzi, W**., Kachroudi, M., & Faiz, S. (2024, April). Sweeping Knowledge Graphs with SPARQL Queries to Palliate Q/A Problems. In International Conference on Advanced Information Networking and Applications (pp. 316-330). Cham: Springer Nature Switzerland. https://link.springer.com/chapter/10.1007/978-3-031-57853-3_27	CP
6	**Fourati, H**., & Saidane, L. A. (2023, October). HealthGlasses Project: WBAN Based Communication for Health Monitoring Through Smart Glasses. In 2023 International Symposium on Networks, Computers and Communications (ISNCC) (pp. 1-6). IEEE. https://ieeexplore.ieee.org/abstract/document/10323668	CP
7	**Ziadi, F., Fourati**, H., & Saidane, L. A. (2024). AI and IoT Uses, Challenges and Opportunities for e-Health: A Review. 2024 International Wireless Communications and Mobile Computing (IWCMC), 873-878. https://ieeexplore.ieee.org/abstract/document/10592569	CP
8	**Samet, N**., Letaifa, A. B., Hamdi, M., & Tabbene, S. (2024, May). Adaptive cloud-based mobile video streaming service using real-time QoE estimation. In 2024 International Wireless Communications and Mobile Computing (IWCMC) (pp. 1309-1314). IEEE. https://ieeexplore.ieee.org/document/10592392	CP
9	**Abderrazek Hachani, Maha Mallek and Yosra Jmal**. Enhancing Academic Success: Performance Early Prediction Using Machine Learning Algorithms. In 12th International Conference on New Technologies, Artificial Intelligence and Smart Data (INTIS 2024). https://easychair.org/publications/preprint/1jST/open	CP
10	**Sassi, A., Chérif, S.**, & Jaafar, W. (2024, June). Intelligent framework for monitoring student emotions during online learning. In International Conference on Engineering Applications of Neural Networks (pp. 207-219). Cham: Springer Nature Switzerland. In: Iliadis, L., Maglogiannis, I., Papaleonidas, A., Pimenidis, E., Jayne, C. (eds) Engineering	CP

1* JA: Journal Article – CP: Conference Paper - BC : Book Chapter

#		Type[1]
	Applications of Neural Networks. EANN 2024. Communications in Computer and Information Science, vol 2141. Springer, Cham. https://link.springer.com/chapter/10.1007/978-3-031-62495-7_16	
11	**Abderrazak Hachani, Yosra Jmal**. (2024). RFID as an IoT enabler for Smart Cities Innovation: a Comprehensive Guide to Demystify RFID Technologies Deployment. The 2nd International Conference on Sustainability: Development and Innovations. ICSDI 24. Lecture Notes in Civil Engineering series. Vol. 556, 2024. https://link.springer.com/chapter/10.1007/978-981-97-8712-8_53	**CP**
12	Bargaoui, Oumaima, Imen Saidi, and **Nahla Touati**. (2024) Design of an Internal Model Controller Using Artificial Intelligence Method. In 2024 IEEE International Conference on Advanced Systems and Emergent Technologies (IC_ASET), pp. 1-6. IEEE, 2024. https://ieeexplore.ieee.org/abstract/document/10596240	**CP**
13	**Bouchoucha, Y**., Omri, D., & Aguili, T. (2023, December). High-Efficiency Rectenna Design for Batteryless Implantable Medical Devices Powered by RF Energy Harvesting in the ISM Band. In 2023 IEEE International Conference on E-health Networking, Application & Services (Healthcom) (pp. 244-250). IEEE. https://ieeexplore.ieee.org/abstract/document/10472364/authors#authors	**CP**
14	**Abidi, Sarra**, Samir Toumi, Mehrez Essafi, Chirine Ghedira Guegan, and Henda Hajjami Ben Ghezala. (2023). Using a Correlation Equation to ensure Stability between Personalization and Security in Composing Web Services." In 2023 20th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA), pp. 1-6. IEEE, December 2023. Giza, Egypt. https://ieeexplore.ieee.org/document/10479231	**CP**
15	**Added, Maha**, Rihab Faouel, Karima Rabaani, and Noureddine Boulejfen. (2023). Kapton-Based High Sensitivity RFID Humidity Sensor. In 2023 22nd Mediterranean Microwave Symposium (MMS), pp. 1-4. IEEE, October 2023 - 01 November 2023. https://ieeexplore.ieee.org/abstract/document/10421366	**CP**
16	Ayadi, Walid, **Amine Saidi, and Ines Channoufi**. (2024). Exploring Human Activity Patterns: Investigating Feature Extraction Techniques for Improved Recognition with ANN." In 2024 IEEE 7th International Conference on Advanced Technologies, Signal and Image Processing (ATSIP), vol. 1, pp. 188-193. IEEE, 11-13 July 2024. https://ieeexplore.ieee.org/abstract/document/10639004/keywords#keywords	**CP**

Electromechanical Engineering



Electromechanical Engineering

RDI Publications (2023-2024 AY)

#	RDI publication	Type[2]
1	**Laabidi, H.**, & Abdelkader, M. A. M. I. (2024, April). Energy Management Algorithm of Hybrid DC Microgrid Using MPC Approach. In 2024 IEEE International Conference on Advanced Systems and Emergent Technologies (IC_ASET) (pp. 1-6). IEEE. 10.1109/ic_aset61847.2024.10596144 https://ieeexplore.ieee.org/abstract/document/10596144	**CP**
2	**Kahla, R. B.**, Ghezail, F., & Harbaoui, I. (2023, December). Data Acquisition System for Hydroponic Culture: A Comprehensive Study and Implementation of Scale Model. In 2023 IEEE Third International Conference on Signal, Control and Communication (SCC) (pp. 1-6). https://ieeexplore.ieee.org/document/10527526	**CP**

2* JA : Journal Article ; CP : Conference Paper

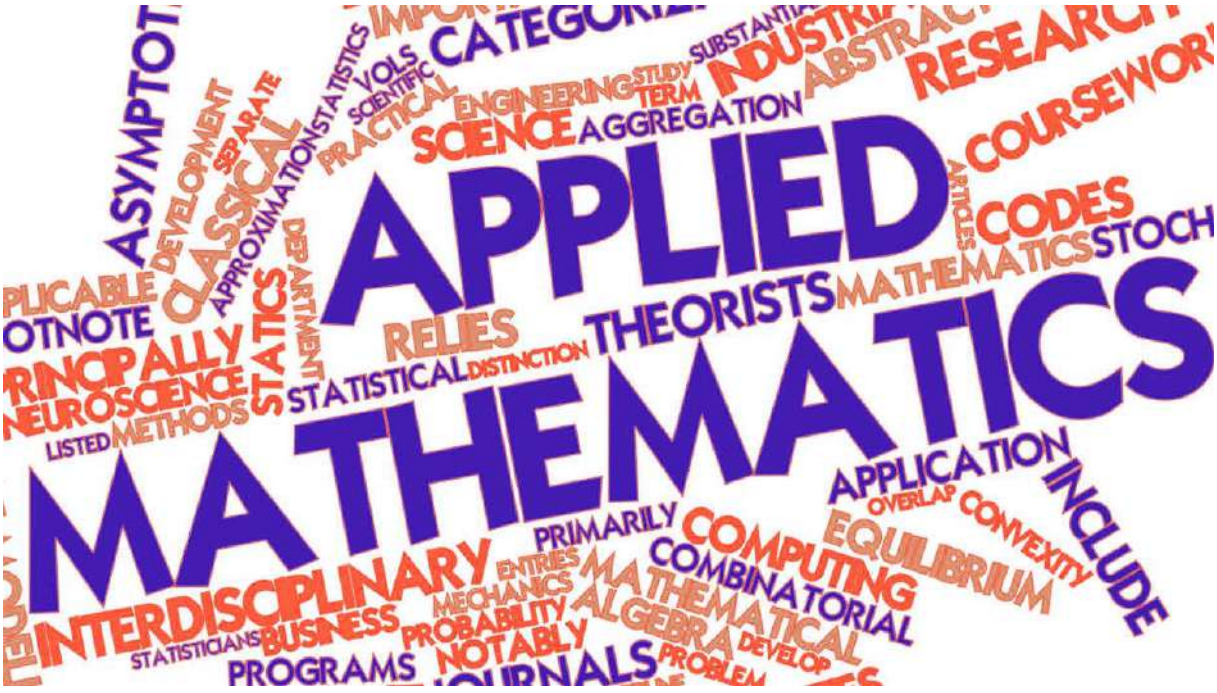
Civil Engineering

Civil Engineering RDI Publications (2023-2024 AY)

#	RDI publication	Type[3]
1	**Allani, A.**, & Bel Hadj Ali, N. (2024). Investigating criteria for the optimisation of single and multiple tuned mass dampers. Proceedings of the Institution of Civil Engineers-Structures and Buildings. https://www.icevirtuallibrary.com/doi/abs/10.1680/jstbu.24.00025	**JA**
	Allani, A., & Bel Hadj Ali, N. (2024). Assessing Vibration Control Performance of Optimized Tuned Mass Damper Inerter (TMDI) Configurations. Journal of Vibration Engineering & Technologies, 1-18. https://link.springer.com/article/10.1007/s42417-024-01509-7	**JA**

2* JA : Journal Article ; CP : Conference Paper

Applied Mathematics



Applied Mathematics RDI Publications (2023-2024 AY)

#	RDI publication	Type[4]
1	Dridi, B., **Amor Ben Ali, A**., & Jaidane, R. (2024). Sign-changing solutions for a weighted Kirchhoff problem with exponential growth non-linearity. Complex Variables and Elliptic Equations, 1-29. DOI: 10.1080/17476933.2024.2310250 https://www.tandfonline.com/doi/abs/10.1080/17476933.2024.2310250	**JA**
2	**Ghorbel, E.,** & Louati, M. (2024). An expectation maximization algorithm for the hidden Markov models with multiparameter student-t observations. Computational Statistics, 39(6), 3287-3301. https://link.springer.com/article/10.1007/s00180-023-01432-7	**JA**
3	**Jbalia, A**. (2023). Stability estimate for an inverse problem of a hyperbolic heat equation from boundary measurement. Indian Journal of Pure and Applied Mathematics 54, no. 1 (2023): 241-252. https://link.springer.com/article/10.1007/s13226-022-00247-4	**JA**
4	Boujelbene, **Mohamed Yessine Labidi, Achref Lemjid**, Lotfi Ncib, **Mohamed khalil Zghal.** (2024). Customer churn prediction model enhancement for the telecommunication industry using data transformation methods and feature selection, Global Scientific Journals, Volume 12, Issue 1, January 2024. https://www.globalscientificjournal.com/researchpaper/Customer_churn_prediction_model_enhacement_for_the_telecommunication_industry_using_data_transformation_methods_and_feature_selection.pdf	**JA**
5	**Riahi, M. H., Maalaoui, H., Hedhli, A**., & Ncib, L. (2024, May). LSTM Network and Box and Jenkins Methodology for Time Series Forecasting: Solar Energy Production. In International Conference on Logistics Operations Management (pp. 46-55). Cham: Springer Nature Switzerland. https://link.springer.com/chapter/10.1007/978-3-031-68628-3_5	**CP**
6	Toumi, Samir, and **Rached Bouyahi**. (2023). Optimization of Rate of Penetration through Regression Model. In Spring School on Control & Inverse Problems, pp. 265-275. Cham: Springer Nature Switzerland, 2023. https://link.springer.com/chapter/10.1007/978-3-031-68046-5_13	**CP**

4* JA : Journal Article ; CP : Conference Paper

Management

Management RDI publication (2023-2024 AY)

#	RDI publication	Type[5]
1	Tebessi, S., **Ben Cheikh, A.**, & Dali, M. (2024). Corporate social responsibility communication after COVID-19: what values for practical implementation of the SDGs?. Qualitative Market Research: An International Journal, 27(4), 536-554. https://www.emerald.com/insight/content/doi/10.1108/qmr-09-2023-0131/full/html	**JA**
2	Saâdaoui, Foued, Monjia Khalfi, and **Rim Ben Elouefi**. (2024). Measuring Islamic banking efficiency using data envelopment and regression analysis. International Journal of Management and Decision Making 23, no. 3 (May - 2024): 311-336. https://www.inderscienceonline.com/doi/epdf/10.1504/IJMDM.2024.138320	**JA**
3	**Cheikh, A. B**., Salem, H. H., & Kotersi, A. (2023). An Empirical Investigation of the Antecedents and Consequences of Virtual Reality Tourism Experiences in Tunisia. In: Exploring Business Ecosystems and Innovation Capacity Building in Global Economics (pp. 92-111). IGI Global. https://www.igi-global.com/chapter/an-empirical-investigation-of-the-antecedents-and-consequences-of-virtual-reality-tourism-experiences-in-tunisia/321900	**BC**
4	**Cheikh, A. B**., & Ferchichi, G. (2023). An Empirical Investigation of Student E-Trust and Enrolment Intention in an Online Paid Hult Prize Certificate Program: A COVID-19 Study. In Exploring Business Ecosystems and Innovation Capacity Building in Global Economics (pp. 66-91). IGI Global. https://www.igi-global.com/chapter/an-empirical-investigation-of-student-e-trust-and-enrolment-intention-in-an-online-paid-hult-prize-certificate-program/321899	**BC**

5* JA : Journal Article ; BC : Book Chapter ; CP : Conference Paper

Pedagogical Innovation

Pedagogical Innovation RDI Publications (2023-2024 AY)

#	RDI publication	Type[6]
1	**Kamoun, F.**, Ayeb, W., Jabri, I., **Sifi, S.**, & Iqbal, F. (2024). Exploring students' and faculty's knowledge, attitudes, and perceptions towards ChatGPT: A cross-sectional empirical study. Journal of Information Technology Education: Research, 23(1). https://www.learntechlib.org/p/224875/	**JA**
2	**Guettat, B., Farhat, R., & Karoui, S.** (2024). An Approach to Assist Learners to Build Their Own Curriculum in Personal Learning Environment Context, Based on the AI Concepts. In: Personal Learning Environment Context, Based on the AI Concepts. IntechOpen. doi: 10.5772/intechopen.1004917 https://www.intechopen.com/chapters/1182906	**BC**
3	**Ghozzi, Y., Karoui, A.** (2024). A Collaborative Learning Model in Engineering Science Based on a Cyber-Physical Production System Line. In: Auer, M.E., Cukierman, U.R., Vendrell Vidal, E., Tovar Caro, E. (eds) Towards a Hybrid, Flexible and Socially Engaged Higher Education. ICL 2023. Lecture Notes in Networks and Systems, vol 899. Springer, Cham. https://link.springer.com/chapter/10.1007/978-3-031-51979-6_19	**CP**
4	**Asma Ayari**, Mariem Chaabouni, Henda Ben Ghezala. (2024). New Learner Model for Intelligent and Adaptive E-learning System. 2023 International Conference on Innovations in Intelligent Systems and Applications (INISTA), Hammamet, Tunisia, 2023, pp. 1-7, doi: 10.1109/INISTA59065.2023.10310323. https://ieeexplore.ieee.org/document/10310323	**CP**
5	**Debbabi, N., & Dchicha, M.** (2024). CDIO-Based Approach: Integrated Learning Experience in Time Series Module. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717976128445-282_Final.pdf	**CP**
6	**Ajailia, N., Zerai, M., Debbabi, N., Damergi, A., & Dchicha, M.** (2024). Ethics, AI, And Society: Shaping Responsible AI Engineers With CDIO Framework. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975222368-157_b_Final.pdf	**CP**
7	**Argoubi, S., Chaari, R., Fraiji, Y., & Hajjem, S.** (2024). Design Thinking and Project-Based Learning Implementation Through Competency-Based Model and Criterion-Referenced Assessment. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975451994-191_b_Final.pdf	**CP**
8	**Argoubi, S., & Rafrafi, N.** (2024). Sustainable Minds: A Learning Experience Enhancing Sustainability Awareness Through A Challenge-Based Approach. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975538061-196_b_Final.pdf	**CP**
9	**Medhioub, M., Argoubi, S., & Bettaieb, L.** (2024). Enhancing Engineering Education Through Integrated Projects and Project Fair: A CDIO Framework Perspective.	**CP**

4* JA : Journal Article ; CP : Conference Paper ; BC : Book Chapter

#	RDI publication	Type[6]
	Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717974817649-139_b_Final.pdf	
10	**Bani, H., Kochbati, I., & Bouakline, M. A**. (2024). Navigating Engineering Competencies for Sustainability Through Generative AI. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717971946256-208_b_Final.pdf	**CP**
11	**Radhouene Massoudi, Abedrazek Hachani, Zaineb Gharssalah, Mohamed Amine Chebbi.** (2024). Comprehensive Approach to Demystify IoT Project Development Under CDIO. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717972594828-274_b_Final.pdf	**CP**
12	**Berhouma, H., & Ghozzi, Y**. (2024). From Students' evaluation of AI Teaching to Teachers' skills Enhancement. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975560011-198_b_Final.pdf	**CP**
13	**Karoui, S., & Bettaieb, L.** (2024). AI-Supported Active Learning in Engineering Education: A Comprehensive Teaching Strategy. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717971002030-148_b_Final.pdf	**CP**
14	**Guettat, B., & Karoui, S**. (2024). Building an Engineer learner Curriculum in The Lifelong Learning Context–PLE and AI Support. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975719842-205_b_Final.pdf	**CP**
15	**Daoud, S. B. H., & Maalaoui, H.** (2024). CDIO Implementation for ESPRIT University Students During Integration Week. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975770723-214_b_Final.pdf	**CP**
16	**Mejri, A., Saoudi, S., & Bouzid, M.** (2024). ChatGPT Framework for Customized Learning Paths: Proof of Concept for ESPRIT. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717972051576-228_b_Final.pdf	**CP**
17	**Feten TEBER, Nadia CHAGTM.** (2024). Empowering Engineers for Lifelong Learning in The IoT Era. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717971190163-159_b_Final.pdf	**CP**
18	**Nouha Samet, Mariem Bouzouita, Soumaya Mbarek**. (2024). Enhancing Sustainability in IT Engineering Education: Case Study of Cloud Integrated Project. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717972178610-264_b_Final.pdf	**CP**
19	**Taheni Kallel, Safa Mhadhbi, Meriem Souibgui**. (2024). Sustainability in Civil Engineering Education. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717976388087-307_Final.pdf	**CP**
20	**Medhioub, M., & Sifi, S**. (2024). Enhancing Project-Based Learning in Engineering Education Through ChatGPT Integration: ESPRIT Case Study. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717972157881-258_b_Final.pdf	**CP**

#	RDI publication	Type[6]
21	**Riahi, M. H., & Ajailia, N.** (2024). Artificial Intelligence in Electro-mechanical Engineering: The ESPRIT Model. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717976080479-269_Final.pdf	CP
22	**Medhioub, M., & Bouakline, M. A**. (2024). Transforming Engineering Learning Towards Sustainable Development. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717974768732-136_b_Final.pdf	CP
23	**Zéraï, M., & Mosbeh, S.** (2024). Implementing CDIO Standards Through Challenge-Based Learning: A Case Study in AI Engineering Education. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717974958075-144_b_Final.pdf	CP
24	**Beji, Afif, Mariem Zoghlemi,** and Kais Ben Abdallah**.** (2024). Active Learning in Civil Engineering: Soil-Mechanics and Steelwork Design as Case Studies. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia https://cdio.esprit.tn:9080/documents/1717976363973-306_Final.pdf	CP
25	**Faouzi Kamoun,** Aymen Ben Brik, Ibtihel Rebhi, Salsabil Besbes, Heni Abidi, Asma Baghdadi, Rym Ammar. (2024). ChatGPT As a Co-Pilot for Assessment Design Refinement: An Exploratory Study**.** Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975824465-229_b_final.pdf	CP
26	**Naouel Boughattas, Wissal Neji, Faten Ziadi.** (2024). Project Based Assessment in the Era of Generative AI: Challenges and Opportunities. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975581996-201_b_Final.pdf	CP
27	**Mathlouthi, Wided, Noura Ben Salah, and Nabil Jguirim**. (2024). Towards Sustainable Virtual Problem-Based Learning in A Tunisian Context. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717972136463-253_b_Final.pdf	CP
28	**Sami, Sifi, and Mourad Zérai**. (2024) Enhancing Conceive-Design Competencies in Part-Time Engineering Education: ESPRIT'S Approach to CDIO. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975277909-172_b_Final.pdf	CP
29	**Souli, Sameh, Souhir Lajnef,** and Rimah Amami**.** (2024). The Impact of AI Tools in Pedagogical Innovation and Adaptive Learning. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717972204798-266_c_Final.pdf	CP
30	**Benromdhane, Firas, Nardine Hanfi, Safouene Jebali, and Mourad Zeraï**. (2024). Quantum Learning: Insights From Case Study in AI Engineering Education. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717976257655-287_b_Final.pdf	CP
31	**Aidli, Salma, Khalil Sridi, and Mourad Zeraï.** (2024) Cultivating Lifelong Learning in AI Engineering: An Experiential Approach Through The 'article Review' Module. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717974981572-145_b_Final.pdf	CP

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32	**Marzouk, Ahlem, and Mohamed Anis Ben Lasmar. (2024).** Data Enabled Flipped Learning in Applied Mathematics: Practical Approach. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717971826782-194_b_Final.pdf	**CP**
33	**Mourad Zerai, and Nadia Ajailia**. (2024). Engineering Education in The Era of Global Responsibility. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia https://cdio.esprit.tn:9080/documents/1717976040774-263_b_Final.pdf	**CP**
34	**Guedria, Khaled, and Maroua Belkneni**. (2024). A Framework for the Assessment of Programming. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia https://cdio.esprit.tn:9080/documents/1717970915030-131_Final.pdf	**CP**
35	**Ghozzi, Yosr, Asma Karoui, Mehdi Hadj Sassi, and Sabrine Bagga**. (2024). Competencies-Based Learning Model Development for a Cyber-Physical Systems Implementation. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia https://cdio.esprit.tn:9080/documents/1717975742225-213_b_Final.pdf	**CP**
36	Kakon, Laura, Asmaâ Fenniri, Benjamin Lisimachio, and **Faouzi Kamoun**. (2024). Enhancing Quality Education at Scale through Generative AI and Adaptive Learning Systems. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia https://cdio.esprit.tn:9080/documents/1717971968955-210_b_Final.pdf	**CP**
37	**Kolsi, Mohamed, and Yosr Ghozzi**. (2024). Motion Control and Coordination Platform for Mobile Robots. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia. https://cdio.esprit.tn:9080/documents/1717975792092-221_b_Final.pdf	**CP**
38	**Faten Tebourbi**, Meriem Chichti, Idriss Mahjoubi . (2024). Implementing AI-Driven Tools in UX Design Course in Engineering and Business Education. Proceedings of the 20th International CDIO Conference, Tunis, Tunisia https://cdio.esprit.tn:9080/documents/1717975118167-151_b_Final.pdf	**CP**
39	**Oumeima Ibn Elfekih**, **Maroua Douiri**. (2024). Exploring the Impact of Artificial Intelligence as a Guide for Students during Assessment. Proceedings of the PAEE/ALE'2024 International Conference on Active Learning in Engineering Education, July 24 - 26, 2024. San Andrés Islas – Colombia. https://doi.org/10.5281/zenodo.14060930 https://zenodo.org/records/14060930	**CP**

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