

# Dr. Marwa Amara

DOCTOR OF COMPUTER SCIENCE · ARTIFICIAL INTELLIGENCE

Northern Border University, Saudi Arabia

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” Be the change that you want to see in the world.”

## About Me

Passionate about machine learning, I excel in the field of artificial intelligence and pattern recognition. My work specifically focuses on deep learning applied to Arabic handwriting recognition and the analysis of complex patterns.

My academic and professional background, combined with significant administrative experience, has strengthened my expertise in this area.

## Education

### National School of Computer Sciences (ENSI)

Manouba University, Tunisia

MASTER IN COMPUTER SCIENCE

2012

- Title: Recognition of Printed Arabic Characters using the Neuro-Genetic Approach.
- Very Honorable

### Faculty of Sciences

University of Gafsa, Tunisia

BACHELOR IN COMPUTER SCIENCE

2010

- Very Honorable

High School Diploma, Mathematics Track Youth City High School Gafsa, Tunisia 2006

## Professional Development

### CERTIFICATIONS

#### Tunis Virtual University

Tunisia

2016

- C2I : National IT and Internet certification

#### Sun Certification

TMI, Tunisia

2014

- SCJA : Sun Certified Associate for the Java Platform, Oracle Testing.
- SCJP : Sun Certified Programmer for the Java Platform, Oracle Testing.
- SCWCD : Sun Certified Programmer for the Java Platform, Oracle Testing.

### SCIENTIFIC RESEARCH TRAINING

#### Northern Border University

Saudi Arabia

2016 - 2024

- SGR-Saudi Global Ranking.
- Selection of Appropriate Journals for Scientific Promotion.
- Ethics of Scientific Research.
- Fundamentals of International Ranking of Peer-Reviewed Scientific Journals.
- The role of researchers in scientific publishing.

### TEACHING STRATEGIES TRAINING

#### Northern Border University

Saudi Arabia

2016 - 2024

- Workshop on Measuring Learning Outcomes.
- Technical Aspects of Handling Program Accreditation Recommendations.
- Modern Teaching Strategies.
- Formulating Learning Outcomes for Academic Programs and Their Evaluation.
- Quality in the Teaching Process.
- Course specification.

## MISCELLANEOUS

### Northern Border University

Saudi Arabia

2016 - 2021

- Practice of Educational Communities.
- "EXIT EXAM".
- Effective Use of the Blackboard Electronic Teaching System.

### Gafsa University

Tunisia

2012 - 2016

- Latex training .
- Second Workshop on Neural Networks For Signal Processing.

### TenStep Tunisia EPM

Tunisia

2014

- Project Management Fundamentals.

## Professional Experience

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### TEACHING

#### Northern Border University

Saudi Arabia

ASSISTANT PROFESSOR

2016 - Now

- Artificial Intelligence, Data Mining, Pattern Recognition.
- Introduction to Programming, Object-Oriented Programming.
- Ethical and Professional Practices, Introduction to Computer Science, Computer Terminology.

#### Gafsa University

Tunisia

ASSISTANT PROFESSOR

2012 - 2016

- Préparation à la certification java.
- Atelier bases des données.

### SUPERVISION

#### University of Gafsa

Tunisia

CO-SUPERVISION OF MASTER'S

2020 - 2023

- Arabic Handwritten Characters and Words Recognition using Hybrid Architecture PSO-CNN.
- Deep Learning pour la reconnaissance des caractères arabe isolés.

#### Northern Border University

Saudi Arabia

GRADUATION PROJECT SUPERVISION

2018 - 2019

- Three Projects.

#### Université de Gafsa

Tunisia

GRADUATION PROJECT SUPERVISION

2015 - 2016

- Two Projects.

### COMMITTEE MEMBERSHIPS AND ADMINISTRATIVE POSITIONS

#### Northern Border University

Saudi Arabia

ASSISTANT PROFESSOR

2016 - 2024

- Head of the Computer Science Department for 4 years.
- Chair of Standard 5 for Computer Science Program Accreditation.
- Quality Assurance Committee.
- Committee for the Creation of Graduate Programs.
- Systems and Curriculum Committee.

### TRAINING AND SEMINARS (AS PRESENTER/TRAINER)

#### Presenter

Saudi Arabia

ARTIFICIAL INTELLIGENCE DAYS

2023

- Optical Character Recognition

## Presenter

COMPUTER SCIENCE DEPARTMENT SEMINARS

- From Machine Learning to Deep Learning

Saudi Arabia

2023

## Trainer

TRAINING FOR ADMINISTRATIVE STAFF

- Excel: Essential Features

Saudi Arabia

2019

## Trainer

HUMAN CAPITAL DEVELOPMENT INITIATIVE

- Preparation for the OCJA Certification

Saudi Arabia

2017

## Trainer

PRIVATE ENGINEERING SCHOOL GAFSA

- Preparation for the OCJA Certification

Tunisia

2015-2014

# Publications

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## JOURNALS

- 1 , O.Alkayed, **M.Amara**, N. Smairi, and A. Zidouri, "Towards Optimal CNN Architectures for Handwritten Arabic Recognition: A PSO-based Hyperparameter Search Approach". *Submitted*
- 2 **M.Amara**, R. Zaghdoud, and O.benrhaïem, "Enhancing Image SEO using deep Learning Algorithms: A Research Investigation". *Submitted*
- 3 , R. Zaghdoud, **M.Amara**, and O.benrhaïem, "An Hybrid Genetic Algorithm Approach based on patients classification to Optimize Home Health Care Scheduling and Routing". *Submitted*
- 4 , O.benrhaïem, R. Zaghdoud, and **M.Amara**, "Towards Optimal CNN Architectures for Handwritten Arabic Recognition: A PSO-based Hyperparameter Search Approach". *Submitted*
- 5 **M.Amara**, N. Smairi, S. Menasri, and A. Zidouri, " Revitalizing Arabic Character Classification Unleashing the Power of Deep Learning with Transfer Learning and Data Augmentation Techniques", Arabian Journal for Science and Engineering, 2024. *Q1*
- 6 , R. Zaghdoud, **M.Amara**, and K. Ghedira, " Improved Particle Swarm Approach for Dynamic Automated Guided Vehicles Dispatching ", International Journal of Advanced Computer Science and Applications, vol.13, No.6, 2022. [Doi: https://doi.org/10.14569/IJACSA.2022.0130646](https://doi.org/10.14569/IJACSA.2022.0130646) *Q3*
- 7 **M.Amara**, and R. Zaghdoud, " Optical Character Recognition using Deep Learning: An enhanced Approach", International Journal of Computer Science and Network Security, vol.22 No.5, 2022. [Doi: https://doi.org/10.22937/IJCSNS.2022.22.5.75](https://doi.org/10.22937/IJCSNS.2022.22.5.75) *Indexed*
- 8 **M.Amara**, K,Zidi, and K. Ghedira , "An efficient and flexible knowledge-based Arabic text segmentation approach" , International Journal of Computer Science and Information Security, vol. 15, No. 7, 2017. [doi:https://www.academia.edu](https://www.academia.edu) *Indexed*

## CONFERENCES

- 1 **M.Amara**,, B. Emna, "Enhancing Intrusion Detection in IoT Networks through Weighted Ensembling of Deep Models and Feature Selection". *Submitted*
- 2 **M.Amara**, and A. Zidouri, " Advanced Handwritten Digit Recognition Using Stacked CNN ". *Submitted*
- 3 , O.Alkayed, **M.Amara**, N. Smairi, and A. Zidouri, "Building a convolutional neural network from scratch for arabic handwritten recognition,". *Submitted*
- 4 **M.Amara**, N. Smairi, and W. Lejouad Chaari, "Efficiency of dropout regularization in character recognition: Introducing the dropout efficiency score within intelligent systems architectures," in 23rd International Conference on Intelligent Systems Design and Applications (ISDA 2023) , December 11-13, 2013, Springer, 2023. *Class C*

- 5 **M.Amara**, K. Zidi, and K. Ghedira, "Structural and statistical feature extraction methodology for the recognition of handwritten arabic words," in 18th International Conference on Hybrid Intelligent Systems (HIS 2018), Held in Porto, Portugal, December 13-15, 2018, Proceedings 18, Springer, 2020, pp. 570–580. [doi:https://doi.org/10.1007/978-3-030-14347-3\\_6](https://doi.org/10.1007/978-3-030-14347-3_6) *Class C*
- 6 **M.Amara**, K. Zidi, and K. Ghedira, "Towards a generic m-svm parameters estimation using overlapping swarm intelligence for handwritten characters recognition," in 17th International Conference on Advanced Concepts for Intelligent Vision Systems (ACIVS 2016), Held in Lecce, Italy, October 24-27, 2016, Proceedings 17, Springer, 2016, pp. 498–509. [doi:https://doi.org/10.1007/978-3-319-48680-2\\_4](https://doi.org/10.1007/978-3-319-48680-2_4) *Class B*
- 7 **M.Amara**, K. Zidi, K. Ghedira, and S. Zidi, "New rules to enhance the performances of histogram projection for segmenting small-sized arabic words," in 15th International Conference on Hybrid Intelligent Systems (HIS 2016), Held in South Korea, November 16-18, 2015, Proceedings 15, Springer, 2016, pp. 167–176. [doi:https://doi.org/10.1007/978-3-319-27221-4\\_4](https://doi.org/10.1007/978-3-319-27221-4_4) *Class C*
- 8 **M.Amara**, K. Ghedira, K. Zidi, and S. Zidi, "A comparative study of multi-class support vector machine methods for arabic characters recognition," in IEEE/ACS 12th International Conference of Computer Systems and Applications (AICCSA 2015), Held in Marrakech, Morocco, IEEE, 2015, pp. 1–6. [doi:https://doi.org/10.1109/AICCSA.2015.7507240](https://doi.org/10.1109/AICCSA.2015.7507240) *Class C*
- 9 **M.Amara**, K. Zidi, S. Zidi, and K. Ghedira, "Arabic Character Recognition Based M-SVM: Review," in 2nd International Conference on Advanced Machine Learning Technologies and Applications (AMLTA 2014), Held in Cairo, Egypt, November 28-30, 2014. Proceedings 2, Springer, 2014, pp. 18–25. [doi:https://doi.org/10.1007/978-3-319-13461-1\\_3](https://doi.org/10.1007/978-3-319-13461-1_3) *Dblp*
- 10 **M.Amara**, and K. Zidi, "Arabic text recognition based on neuro-genetic feature selection approach," in 2nd International Conference on Advanced Machine Learning Technologies and Applications (AMLTA 2014), Held in Cairo, Egypt, November 28-30, 2014, Proceedings 2, Springer, 2014, pp. 3–10. [doi:https://doi.org/10.1007/978-3-319-13461-1\\_1](https://doi.org/10.1007/978-3-319-13461-1_1) *Dblp*
- 11 **M.Amara**, and K. Zidi, "Feature selection using a neuro-genetic approach," in In the proceeding of 4th International Conference on Metaheuristics and Nature Inspired Computing, META 2012, Sousse, Tunisia, October 27-31, 2012. *Abstract*

## BOOK CHAPTER

- 1 **M.Amara**, and K. Zidi, "New mechanisms to enhance the performances of arabic text recognition system: Feature selection," in Handbook of Research on Machine Learning Innovations and Trends, IGI Global, 2017, pp. 879–896. 8. [Doi:https://doi.org/10.4018/978-1-5225-2229-4.ch038](https://doi.org/10.4018/978-1-5225-2229-4.ch038) *IGI Globa*

## Research Projects

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### Funded Research Projects - Twelfth Edition

*Saudi Arabiae*

NORTHERN BORDER UNIVERSITY

*2023-Now*

- Enhancing Image SEO using deep Learning Algorithms: A Research Investigation.
- Blockchain-based System toward Data Security against Smart Contract Vulnerabilities: Electronic Toll Collection Context.
- An Hybrid Genetic Algorithm Approach based on patients classification to Optimize Home Health Care Scheduling and Routing.

### Funded Research Projects - Tenth Edition

*Saudi Arabia*

NORTHERN BORDER UNIVERSITY

*2021-2022*

- Optical Character Recognition using Deep Learning: An enhanced Approach.

### Funded Research Projects - Ninth Edition

*Saudi Arabia*

NORTHERN BORDER UNIVERSITY

*2020-2022*

- Improved Particle Swarm Approach for Dynamic Automated Guided Vehicles Dispatching.

## Scientific Impact

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2023	<b>Session Chair</b> , 23 rd International Conference on Intelligent Systems Design and Applications	<i>Class C</i>
2023	<b>reviewer</b> , Engineering, Technology & Applied Science Research journal	<i>peer-reviewed</i>
2023	<b>reviewer</b> , Int. J. of Networking and Virtual Organisations	<i>Q4</i>
2023	<b>reviewer</b> , 1st IEEE Afro-Mediterranean Conference on Artificial Intelligence	<i>IEEE</i>
2023	<b>reviewer</b> , 3d International Conference on Emerging Smart Technologies and Applications	<i>IEEE</i>
2022	<b>reviewer</b> , 2nd International Conference on Emerging Smart Technologies and Applications	<i>IEEE</i>
2022	<b>reviewer</b> , International Conference on Sciences of Electronics, Technologies of Information and Telecommunications	<i>IEEE</i>
2020	<b>reviewer</b> , The 10th International Conference on Electronics, Communications and Networks	<i>IEEE</i>

## Honors & Awards

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2012	<b>MOBIDOC Doctoral Scholarship</b> , National Agency for the Promotion of Scientific Research (ANPR), Ministry of Higher Education and Scientific Research	<i>Tunisia</i>
2010	<b>Class Valedictorian</b> , Department of Computer Science, Faculty of Sciences, Gafsa University	<i>Tunisia</i>