Souhaila DJAFFAL

+213 778 853 887 | souhaila.djaffal@univ-tebessa.dz

souhaila DJAFFAL | Souhaila-DJAFFAL | souhaila djaffal

DJEBAL ANOUAL Avenue, bl 2/ apt 3. 12022 Tebessa, Algeria

Professional Summary

A PhD candidate in AI with a solid grounding in machine learning, pattern recognition, and advanced data analytics, I'm now focused on applying these skills to the global AI safety and policy landscape. My work on machine unlearning has given me firsthand expertise in data privacy, model integrity, and system robustness, essential elements for crafting effective governance and regulatory frameworks. I've completed LinkedIn Learning's "Security Risks in AI and Machine Learning: Categorizing Attacks and Failure Modes," and I'm eager to bring this blend of technical depth and policy-oriented mindset to research at the intersection of AI and safety policy.

Education

- **PhD student in Computer Science** — *Tebessa, Algeria*
  Faculty of Exact, Natural and Life Sciences (FSESNV), Echahid Cheikh Larbi Tebessi University — 2021 - Present
  - Thesis: A Contribution for Script Identification from Handwritten and Printed Documents.
  - Supervisor: Prof. Chawki Djeddi, Co-Supervisor: Dr. Moises Diaz.
- **Master's degree in Computer Sciences: Systems and Multimedia** — *Tebessa, Algeria*
  Faculty of Exact, Natural and Life Sciences (FSESNV), Echahid Cheikh Larbi Tebessi University — 2015 - 2017
  - Theme: Biometric Watermarking for Copyright Preservation.
  - Distinction: Very Good
- **Bachelor's degree in Computer Science: Information Systems and Software Engineering** — *Tebessa, Algeria*
  Faculty of Exact, Natural and Life Sciences (FSESNV), Echahid Cheikh Larbi Tebessi University — 2012 - 2015
  - Theme: Development of Mobile Application: Dictionnaire Assisté des Termes Informatique.
  - Distinction: Very Good

Projects

- **Automatic Handwriting and Printed Script Identification System**
  April 2021 - Present
  - Proposed and developed robust and efficient AI systems for multi-level script identification (a complex pattern recognition task in diverse datasets) in machine-printed and handwritten documents using local image features, applicable to analyzing and securing information in complex digital environments.
  - Hierarchical Script Identification using Dense RootSIFT, Word2Vec-Enhanced BoVW, and Probabilistic Top-Down Contextualization.
  - Addressed significant challenges of class imbalance using advanced Sampling techniques, improving classifier performance for minority scripts.
  - Developed a novel approach integrating a learned resizer (MULLER) with k-means clustering for adaptive image resizing, enhancing hybrid word-level script identification performance through adaptive data processing.
  - Investigated the application of machine unlearning techniques to enhance data privacy and model integrity in AI systems, specifically exploring scenarios for selectively 'forgetting' information within script identification models. This research addresses critical aspects of secure and responsible AI development, including data minimization and the mitigation of risks associated with persistent data in intelligent systems.
- **Breast Cancer Histopathological Image Classification**
  November 2023 - Present
  - Managed and analyzed sensitive medical imaging data, investigating stain normalization techniques to improve feature extraction reliability and data integrity across diverse feature levels.
  - Developed a novel adaptive knowledge distillation (KD) approach to enhance the efficiency and accuracy (achieving 98.08%) of grading Invasive Ductal Carcinoma (IDC) histopathological images, emphasizing model robustness.
  - Applied Explainable AI (XAI) methods (Grad-CAM) for visualizing and interpreting key image areas influencing classification decisions, a technique vital for model transparency and building trustworthy AI systems in critical applications.
  - Developed a novel knowledge distillation (KD) framework tailored for magnification-dependent grading of Invasive Ductal Carcinoma (IDC) using histopathological images.

PUBLICATIONS

C=CONFERENCE, S=IN SUBMISSION

[J] Yasmina Benmabrouk, Souhaila Djaffal, Gasmi Mohamed, Chawki Djeddi, Moises Diaz, Hakim Bendjenna. (2025). **Enhancing Breast Cancer Histopathological Image Classification: The Impact of Stain Normalization on Multilevel Feature Extraction**. Biomedical Signal Processing and Control. DOI: 10.1016/j.bspc.2025.107700

[C.1] Souhaila Djaffal, Yasmina Benmabrouk, Chawki Djeddi, Moises Diaz. (2025). **Breaking Boundaries: Enhancing Script Identification Using a Learnable MULLER Resizer.** In *Antonacopoulos, A., Chaudhuri, S., Chellappa, R., Liu, CL., Bhattacharya, S., Pal, U. (eds) Pattern Recognition. ICPR 2024. Lecture Notes in Computer Science, vol 15331.*, pp. 222–236. Springer, Cham. DOI: 10.1007/978-3-031-78119-3_16

[C.2] Souhaila Djaffal, Yasmina Benmabrouk, Chawki Djeddi, Moises Diaz. (2024). **Addressing Class Imbalance in Handwritten Script Identification Using Sampling Techniques.**. In *the 6th Mediterranean Conference on Pattern Recognition and Artificial Intelligence, **MedPRAI24***.

[C.3] Yasmina Benmabrouk, Souhaila Djaffal, Gasmi Mohamed, Hakim Bendjenna. (2024). **Knowledge Distillation for IDC Grading: Magnification-Dependent Approach.**. In *the 6th Mediterranean Conference on Pattern Recognition and Artificial Intelligence, **MedPRAI24***.

[C.4] Souhaila Djaffal, Yasmina Benmabrouk, Chawki Djeddi, Moises Diaz. (2024). **When Machine Unlearning Meets Script Identification.** In *the 26th Irish Machine Vision and Image Processing Conference, Vol. 2024, Iss. 10*, pp. 347–350. IET Conference Proceedings. DOI: 10.1049/icp.2024.3330

[C.5] Yasmina Benmabrouk, Souhaila Djaffal, Gasmi Mohamed, Hakim Bendjenna. (2024). **Adaptive Knowledge Distillation for Invasive Ductal Carcinoma Grading using histopathological images.**. In *the 26th Irish Machine Vision and Image Processing Conference, Vol. 2024, Iss. 10*, pp 339–342. IET Conference Proceedings. DOI: 10.1049/icp.2024.3328

[S] Souhaila Djaffal, Chawki Djeddi, Moises Diaz, Abdelhakim Hannousse. (2024). **A Robust Analysis of Local Image Descriptors Using Bag of Visual Words Model for Multi-Level Script Identification in a Multi-Script Environment**. Manuscript submitted for publication in *Engineering Applications of Artificial Intelligence*.

PROFESSIONAL EXPERIENCE

- **Echahid Cheikh Larbi Tebessi University [🌐]** *Sep 2019 - May 2020 & Sep 2022 - Dec 2022 & Sep 2023 - Dec 2024*
  Adjunct Professor Tebessa, Algeria
  - Department: Mining Engineering
  - Responsibilities included preparing and delivering technical course material, explaining complex concepts, fostering an effective learning environment, and honing strong communication and pedagogical skills.
- **The Sparks Foundation [🌐]** *Nov 2021 - Dec 2021*
  Computer Vision and IOT intern Remote
  - Program: The Graduate Rotational Internship Program (GRIP)
  - Applied computer vision techniques and IoT principles in practical projects, enhancing skills in system development and data processing.

SKILLS

- **Programming Languages:** Python, R, C++, MATLAB
- **Machine Learning Frameworks:** OpenCV, Pandas, Scikit-learn, Numpy, Seaborn, Matplotlib, TensorFlow, Keras
- **Specialized Area:** Script Identification, Machine Unlearning, Explainable AI, Knowledge Distillation, Histopathological Image Classification, Medical Imaging.
- **Research Skills:** Data Collection & Preprocessing, Statistical Analysis, Research Paper Writing, LaTeX (Overleaf), Mendeley, Zotero.
- **Technical Tools:** Microsoft Office 365, Tableau, Google Sheets, Google BigQuery, SQL
- **Languages:** Arabic, English, French

SCHOOLS & WORKSHOPS

- **2025 Middle East and North Africa Machine Learning Winter School "MenaML"** *Feb 2025*
  Doha, Qatar [🌐]
  - A six-day intensive program offering a unique blend of keynotes, lectures, and hands-on practical sessions. Lectures and lab sessions are taught by local and international AI experts from leading institutes such as Google DeepMind, Qatar Computing Research Institute (QCRI), HBKU, and others.
- **Artificial Intelligence for Smart Agriculture Workshop "Smart Agri-Tech"** *Feb 2023*
  University of El Oued, Algeria
  - The event focused on leveraging advanced digital technologies such as artificial intelligence, the Internet of Things, and cloud computing to enhance agricultural production efficiency and connectivity.
- **30 Days of ML Challenge** *Aug 2021*
  Kaggle [🌐]
  - Completed the 30 Days of ML challenge: Python, Intro to ML, and Intermediate ML courses and competed in a special competition.

Academic Services

- **Reviewer for:** Engineering Applications of Artificial Intelligence Journal *Feb 2025 - Apr 2025*
- **Reviewer for:** Biomedical Signal Processing and Control Journal *May 2024 - Mar 2025*
- **Reviewer for:** The 27th International Conference on Pattern Recognition (ICPR 2024) *Jul 2024*
- **Reviewer for:** The 2nd International Conference on Artificial Intelligence, Blockchain (AIBThings 2024) *Jun 2024*

Certifications

- **Issued by Turing College:** AI Ethics Course *June 2025 - Present*
- **Issued by LinkedIn Learning:** Security Risks in AI and Machine Learning *June 2025*
- **Issued by Google and Coursera:** Google Data Analytics Professional Certificate *June 2022*
- **Issued by NVIDIA DL Institute:** Fundamentals of Deep Learning *Feb 2022*
- **Issued by Kaggle:** Python Course *August 2021*
- **Issued by Kaggle:** Intro to Machine Learning *August 2021*
- **Issued by Kaggle:** Intermediate Machine Learning *August 2021*

References

1. **Prof. Chawki Djeddi**
   Full Professor, Department of Mathematics and Informatics
   Echahid Cheikh Larbi Tebessi University, Tebessa, Algeria
   Email: c.djeddi@univ-tebessa.dz
   Phone: +213671900511

2. **Dr. Moises Diaz**
   Associate Professor, Department of Physics
   Universidad de Las Palmas de Gran Canaria, Campus de Tafira, Las Palmas de Gran Canaria, Spain
   Email: moises.diaz@ulpgc.es
   Phone: +34 92845 4499