

Curriculum Vitae

Abdesselam FERDI, PhD

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Date of the CV: September 10, 2026

RESEARCH PROFILE

Postdoctoral researcher working on efficient and interpretable deep learning methods for medical imaging and real-world applications.

KEY CONTRIBUTIONS

- **Interpretable AI with Foundation models:** Developed interpretable-by-design image classification models based on LLMs and VLMs (Under review, 2026).
- **Physics-inspired structured pruning:** Developed Electrostatic Force and Gravity regularization methods for efficient neural networks (*Information Sciences*, 2026).
- **Efficient models for medical image analysis:** Designed lightweight architectures (G-YOLO and RED-CNN) for fracture detection and LDCT denoising (*Biomedical Signal Processing and Control*, 2026; *Multimedia Tools and Applications*, 2025).

RESEARCH INTERESTS

Efficient machine learning • Interpretable medical AI • Medical image analysis • Physics-inspired machine learning

PROFESSIONAL EXPERIENCE

Research Fellow (Explainable AI)

2025–present

University of Tartu, Faculty of Social Sciences, Narva College

Links: <https://bigdata.cs.ut.ee/> and https://www.etis.ee/CV/Abdesselam_Ferdi

Research: Development of novel machine learning models that are interpretable by design, along with methods to explain the decision-making processes of deep learning models.

Teaching: Teach a full seminar course on Explainable AI to undergraduate and graduate students.

Researcher (Model compression)

2023–2024

Laboratoire LISSI, Université Paris-Est Créteil, Paris, France

Link: <https://www.lissi.fr/home/>

Research: (1) Development of advanced deep learning algorithms for the denoising of low-dose CT images; (2) Development of two novel pruning methods for the acceleration of deep learning algorithms.

Teaching: Taught courses on deep learning and Python programming to undergraduate and graduate students.

Teaching assistant

2021–2023

Constantine 1 University & ENS Biotechnology, Constantine, Algeria

Links: <https://www.umc.edu.dz/index.php/en> and <https://wp.ensbiotech.edu.dz/en/>

Teaching: Taught courses on image processing, electronics, numerical methods, informatics, and Matlab programming to undergraduate and graduate students.

Biomedical Engineering Intern

2018

Dr. Benbadis University Hospital Center, Constantine, Algeria

Role: Participated in the maintenance of biomedical equipment and hospital utilities and collaborated with engineers on technical repairs and preventive maintenance protocols.

ACADEMIC SERVICES

Reviewing Editor, Springer Nature Reviewer Communities (2025–present)

Peer-review activity: 41 peer reviews recorded on ORCID across 14 journals.

Conference Reviewer: *MICCAI, MIDL, ISBI, BMVC*

Journal Reviewer: *Medical Image Analysis, Computers in biology and medicine, Artificial Intelligence Review, Neurocomputing, Applied Intelligence, Biomedical Signal Processing and Control, Pattern Recognition Letters*, etc.

TPC Member: FLLM 2026

EDUCATION

PhD in Biomedical Engineering

2021–2024

SP-LAB, Electronics Department, Constantine 1 University, Constantine, Algeria

Link: <https://www.umc.edu.dz/index.php/en>

MSc in Biomedical Engineering

2018–2020

SP-LAB, Electronics Department, Constantine 1 University, Constantine, Algeria

Link: <https://www.umc.edu.dz/index.php/en>

BSc in Biomedical Engineering

2015–2018

Electronics Department, Constantine 1 University, Constantine, Algeria

Links: <https://www.umc.edu.dz/index.php/en>

PhD DISSERTATION

Dissertation Title: *Medical Image Analysis with Deep Learning*

Supervisor: Prof. Said Benierbah

Rank in the PhD admission exam: **1st / 127**

Defense date: January 09, 2025

Distinction: **Very honorable**

This dissertation presented novel deep learning models for the automatic denoising of LDCT images and the automatic localization of ICH in CT images.

MASTER'S THESIS

Thesis Title: ***Classification and Segmentation of COVID-19 CXR and Chest CT Images using Deep Learning Algorithms***

Supervisor: Prof. Said Benierbah

Rank: **1st / 33**

This thesis proposed advanced deep learning algorithms for the automatic classification and segmentation of COVID-19 in CXR and CT images.

RESEARCH FUNDING & GRANT WRITING

- **Marie Skłodowska-Curie Postdoctoral Fellowship (MSCA-PF):** Lead applicant and proposal author.
- **Estonian Research Council (ETAG) PRG Team Grant:** Co-contributor.

RESEARCH EVALUATION ACTIVITIES

Grant Proposal Evaluator for the 2026 EIG CONCERT-Japan Joint Call on AI-Powered Robotics for Real-World Applications

TECHNICAL SKILLS

Programming: Python, Matlab

Frameworks: PyTorch, TensorFlow, OpenCV, Scikit-learn, and others

Tools: NumPy, Pandas, HDF5, LaTeX

Systems: Linux, Windows

ADDITIONAL

MSc Thesis Examiner: Marvin Üürke (January 2026). Foundations for Predictive Analytics in Supercapacitor Manufacturing. University of Tartu.

Languages: English & French (professional-level proficiency)

LIST OF PUBLICATIONS

Journal Articles: 4 (all as the first author)

1. **Abdesselam Ferdi**, Abdelmalik Taleb-Ahmed, Amir Nakib, and Youcef Ferdi. Electrostatic Force Regularization for Neural Structured Pruning. *Information Sciences*. 2026.
Link: <https://www.sciencedirect.com/science/article/pii/S002002552501182X>
2. **Abdesselam Ferdi**. Lightweight G-YOLOv11: Advancing Efficient Fracture Detection in Pediatric Wrist X-rays. *Biomedical Signal Processing and Control*. 2026.
Link: <https://www.sciencedirect.com/science/article/abs/pii/S1746809425013722>
3. **Abdesselam Ferdi**, Said Benierbah, and Amir Nakib. Residual encoder-decoder based architecture for medical image denoising. *Multimedia Tools and Applications*. 2025.
Link: <https://link.springer.com/article/10.1007/s11042-024-20175-1>
4. **Abdesselam Ferdi**, Said Benierbah, Amir Nakib, Youcef Ferdi, and Abdelmalik Taleb-Ahmed. Quadratic Convolution-based YOLOv8 (Q-YOLOv8) for localization of intracranial hemorrhage from head CT images. *Biomedical Signal Processing and Control*. 2024.
Link: <https://www.sciencedirect.com/science/article/abs/pii/S1746809424006694>

Conference articles: 6 (all as the first author)

1. **Abdesselam Ferdi**. Deep Convolutional Neural Networks Structured Pruning via Gravity Regularization. *IEEE International Conference on Machine Learning & Applied Network Technologies*. 2024.
Link: <https://ieeexplore.ieee.org/document/10908799>
2. **Abdesselam Ferdi** and Amir Nakib. YOLO based Object detection Enhancement based on Quadratic Convolution. *International Conference on Foundation and Large Language Models*. 2024.
Link: <https://ieeexplore.ieee.org/document/10852440>
3. **Abdesselam Ferdi**, Said Benierbah, and Youcef Ferdi. YOLOv3-based Intracranial Hemorrhage Localization from CT Images. *International Symposium on Advanced Topics in Electrical Engineering*. 2023.
Link: <https://ieeexplore.ieee.org/document/10108273>
4. **Abdesselam Ferdi**, Said Benierbah, and Youcef Ferdi. Colorization Technique to improve DCNN-based ICH CT Image Classification. *Conférence Nationale sur les Télécommunications et ses Applications*. 2023.
5. **Abdesselam Ferdi**, Said Benierbah, and Youcef Ferdi. U-Net-based Semantic Segmentation of COVID-19 Chest CT Images: A Transfer Learning Approach. *International Conference on Image and Signal Processing and their Applications*. 2022.
Link: <https://ieeexplore.ieee.org/document/9786341>

6. Abdesselam Ferdi, Said Benierbah, and Youcef Ferdi. Five Deep Learning Models for Classification of Chest X-Ray Images of COVID-19. *International Conference on Electronics, Artificial Intelligence and New Technologies*. 2021.

Under Review: 2 (as the first author)

1. Abdesselam Ferdi and Radwa El Shawi. Language Optimization for Concept Bottleneck Models. Under Review. 2026.

2. Abdesselam Ferdi and Radwa El Shawi. FALCON-RL: Federated Aligned Language-guided CONcept-oriented Rule Learning. Under Review. 2026.