



Hamdi BRAIEK

PH.D. APPLIED MATHEMATICS
ASSOCIATE PROFESSOR · DATA SCIENCE
SPECIALIST

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braiekhamdi

Hamdi-Braiek

hamdi-braiek

CONTACT

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ESPRIT, 1-2 rue André Ampère,
2083 El Ghazala, Tunisia

RESEARCH INTERESTS

Optimization PDE & Variational Methods
Image Processing Numerical Algorithms
Computer Vision Inverse Problems
Machine Learning Deep Learning
Fractional Calculus PINN Scientific Computing

TECHNICAL SKILLS

Python

MATLAB / R / FreeFem++

LaTeX / Scientific Writing

MS Office (Word/Excel/PPT)

LANGUAGES

Arabic (Native) ●●●●●
French (Fluent) ●●●●●
English (Advanced) ●●●●●

ACADEMIC & PROFESSIONAL PROFILES

ORCID: 0000-0002-3301-1385 github/braiekhamdi ResearchGate/Hamdi-Braiek
 LinkedIn/hamdi-braiek

01 Education

2014-2019



Ph.D. in Applied Mathematics

National Engineering School of Tunis (ENIT) — University of Tunis El Manar

Thesis: "Variational and numerical techniques for medical ultrasound image analysis"

Supervisors: Prof. Maher Moakher & Prof. Badreddine Rjaibi

Reviewers: Prof. Didier Auroux (Univ. Côte d'Azur) & Prof. Zakaria Belhachmi (Univ. Haute Alsace)

2023-2025



M.Sc. Business Analytics & Data Science

Virtual University of Tunis (UVT)

Skills: NoSQL, Python for Data Science, Power BI, Hadoop & Big Data ecosystems, Advanced ML & AI.

2012-2014



M.Sc. Research in Mathematics

Faculty of Sciences of Tunis (FST) — University of Tunis El Manar

Thesis: "Reconstruction of boundary data: The case of Stokes equations"

Supervisor: Prof. Faten Khayat

2009-2011



B.Sc. Fundamental Mathematics

Faculty of Sciences of Monastir (FSM) — University of Monastir

2007-2008



Baccalauréat — Mathematics

Tunisia

02 Academic Positions

2021-
present



Associate Professor (Full-Time)

ESPRIT — École Supérieure Privée d'Ingénierie et de Technologies, Tunis

Courses: Machine Learning, ML Optimization, Estimation Techniques, Numerical Analysis, Scientific Computing, Engineering Mathematics (levels 1-4). Research supervision & student project mentoring.

2019-2020



Contract Assistant Professor

ENSTAB — National School of Advanced Sciences and Technologies of Borj Cedria,
University of Carthage

Courses: Integration & Probability, Numerical Analysis, Optimization.

2018-2019



Part-time Teacher

ENIT — National Engineering School of Tunis & ESPRIT

Courses: MATLAB Initiation (ENIT); Engineering Mathematics I & II (ESPRIT).

2017-2018



Contract Assistant Professor

ISBB — Higher Institute of Biotechnology of Beja & ENIT

Courses: Applied Mathematics (ISBB); MATLAB Initiation (ENIT).

2015-2016



Part-time Teacher

ISAMM — Higher Institute of Arts and Multimedia Manouba & ESPRIT

Courses: Numerical Analysis (ISAMM); Engineering Mathematics (ESPRIT).



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CERTIFICATIONS

Neural Networks & Deep Learning

DeepLearning.AI · Jun 2022 · ID: L3HJRHE9XZ9K

Convolutional Neural Networks

DeepLearning.AI · Apr 2022 · ID: NF759WHZADLE

Hyperparameter Tuning, Regularization & Optimization

DeepLearning.AI · Sep 2022 · ID: KST9PHQSQWDU

Machine Learning with Python

IBM · Jul 2022 · ID: EQZ8GLUX

ML in Python with Scikit-learn

France Université Numérique · May 2022

Supervised Learning with Scikit-learn

DataCamp · Dec 2022 · ID: 6695887

Data Science & ML Fundamentals

CFI · Dec 2022 · ID: 63587562

ML & Business Intelligence

Tunisian Data Science Assoc. · Aug 2019

RESEARCH STAYS

Laboratoire J.A. Dieudonné

Université Côte d'Azur (Nice)

Jun–Jul 2018

Jun–Jul 2017

Oct–Nov 2016

SOFTWARE & TOOLS

Python

MATLAB

FreeFem++

Scikit-learn

TensorFlow

PyTorch

Power BI

Hadoop

MongoDB

LaTeX

MS Word

MS Excel

MS PowerPoint

Linux

Windows

03

Publications



For the full and up-to-date list of publications, visit: [Google Scholar](#) · [ORCID 0000-0002-3301-1385](#) · [ResearchGate/Hamdi-Braiek](#)

Published & Accepted Articles

11. H. Braiek, *A Fractional-Order Total Variation Regularization for Speckle Noise Removal and Its Numerical Algorithm*, *Journal of Mathematical Sciences*, 2026. DOI: [10.1007/s10958-026-08611-z](#)
10. H. Braiek, *Variational Physics-Informed Neural Networks for the $p(x)$ -Laplacian Problem*, *Boletim da Sociedade Paranaense de Matemática*, Vol. 44, No. 12, 2026. DOI: [10.5269/bspm.79742](#)
9. H. Braiek, *A fixed-point iteration for nonlinear PDE involving variable exponent function*, *Advanced Studies: Euro-Tbilisi Mathematical Journal*, Vol. 19, No. 2, pp. 123–140, 2026. DOI: [10.32513/asetmj/193220082619209](#)
8. H. Braiek, *A new weighted Caputo fractional-order total variation for Cauchy noise removal with Bayesian optimization*, *The Visual Computer*, Vol. 42, No. 9, article number 364, 2026. DOI: [10.1007/s00371-026-04524-9](#)
7. H. Braiek, *Optimal Control Problem with Total Variation for $p(x)$ -Biharmonic Constraint and Approximation*, *Jordan Journal of Mathematics and Statistics*, accepted 2026.
6. H. Braiek, *Primal-Dual Method for Image Denoising with Variable Exponent Sobolev Spaces*, *Moroccan Journal of Pure and Applied Analysis*, Vol. 11, No. 2, pp. 117–133, 2025. DOI: [10.34874/PRSM.mjpa-vol11iss2.5711](#)
5. H. Braiek, N. Nagati, M. Trabelsi, A. Ben Ayed, N. Mezni, M. A. Askri, *Advanced Spatio-Temporal Modeling of Seagrass Meadows Through Machine Learning Techniques*, In: Kamoun, F. et al., *AFRICATEK 2025, LNICST Vol. 677, Springer, Cham*, 2026. DOI: [10.1007/978-3-032-16638-8_15](#)
4. H. Houichet, A. Theljani, M. Moakher, *A nonlinear fourth-order PDE for image denoising in Sobolev spaces with variable exponents and its numerical algorithm*, *Computational and Applied Mathematics*, Vol. 40, No. 70, 2021. DOI: [10.1007/s40314-021-01462-1](#)
3. A. Theljani, H. Houichet, A. Mohamed, *An adaptive Cahn-Hilliard equation for enhanced edges in binary image inpainting*, *Journal of Algorithms & Computational Technology*, Vol. 14, pp. 1–10, 2020. DOI: [10.1177/1748302620941430](#)
2. H. Houichet, M. Moakher, B. Rjaibi, *A topological sensitivity method to remove noise and detect edges in ultrasound images*, *New Trends in Mathematical Sciences*, Vol. 7, No. 4, pp. 421–440, 2019. DOI: [10.20852/ntmsci.2019.383](#)
1. H. Houichet, A. Theljani, M. Moakher, B. Rjaibi, *A nonstandard higher-order variational model for speckle-noise removal and thin-structures detection*, *Journal of Mathematical Study*, Vol. 52, No. 4, pp. 394–424, 2019. DOI: [10.4208/jms.v52n4.19.03](#)

Papers Under Review

- R1. H. Braiek, *A Novel Adaptive Variable-order Fractional Model for Speckle Noise Removal with Bayesian Optimization* — under review.
- R2. H. Braiek, *Deep Learning-Based Framework for Plastic Debris Detection in Dynamic Aquatic Ecosystems* — under review.

Papers Submitted

- S1. H. Braiek, *Adaptive Variable Exponent Functional for Multiplicative Noise Removal in Ultrasound Imaging* — submitted.

Papers In Preparation

- P1. H. Braiek, *Nash-equilibrium Game with Argyris Elements for Biharmonic Cauchy Data Completion in Thin Plates* — (with A. B. H. Hassin) — in preparation.



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OPERATING SYSTEMS

Linux (Ubuntu) Windows 10/11

OFFICE & PRODUCTIVITY

MS Office (Word/Excel/PPT)

LaTeX / Beamer

DATA SCIENCE STACK

Pandas / NumPy

Matplotlib / Seaborn

TensorFlow / Keras

PyTorch

NoSQL (MongoDB, Cassandra, Neo4j)

Spark / Hive / MapReduce

HOBBIES AND INTERESTS

Sports

Running · fitness training

Music

Motivational · classical music

Movies

Fiction · Adventure films

04 Conference Presentations

- ICAOTA 2026** — A Variable-Order Fractional Total Variation Operator for Image Restoration. [The First International Conference on Advances in Operator Theory and Applications](#), Hammamet, Tunisia, 24–26 March 2026.
- ICRAMI 2025** — Edge-Aware Image Denoising via Adaptive Weighted Fractional-Order Total Variation under Cauchy Noise. [International Conference on Recent Advances in Mathematics and Informatics](#), Sousse, Tunisia, 20–23 November 2025.
- AFRICATEK 2025** — Advanced Spatio-Temporal Modeling of Seagrass Meadows Through Machine Learning Techniques. [8th EAI International Conference on Emerging Technologies for Developing Countries](#), ESPRIT, Tunisia, 11–13 June 2025.
- CARI 2018** — Split-convexity for image restoration. [African Conference on Research in Computer Science and Applied Mathematics](#), Stellenbosch, South Africa, 14–16 October 2018.
- PICOF 2018** — Image restoration based on $p(x)$ -biharmonic operator. [International conference on Inverse Problems, Control, and Shape Optimization](#), Beirut, Lebanon, 18–20 June 2018.
- CMES 2017** — A Nonstandard Higher-Order PDE for Edge Detection in Medical Imaging Problems. [2nd International Conference on Computational Mathematics and Engineering Sciences](#), Istanbul, Turkey, 20–22 May 2017.
- TAMTAM 2017** — Variable-exponent Kirchhoff model for image restoration and edges detection using the topological gradient method. [8th Trends in Mathematical Applications in Tunisia, Algeria, Morocco](#), Hammamet, Tunisia, 10–13 May 2017.
- LEM2I 2016** — Nonlinear variational model for image segmentation problem. [International Conference of the Euro-Maghreb Laboratory of Mathematics and their Interactions](#), Hammamet, Tunisia, 27 April – 1 May 2016.
- AMIR 2016** — $p(\cdot)$ -Kirchhoff model to speckle-noise removal and thin-structures detection. [International Conference on Advanced Methods in Image Reconstruction](#), Tunis, Tunisia, 16 December 2016.
- PICOF 2016** — Topological gradient approach to speckle noise removal and edge detection in ultrasound images. [International conference on Inverse Problems, Control, and Shape Optimization](#), Autrans, France, 1–3 June 2016.

Seminars: LAMSIN/ENIT (Jan 2017) · LJAD Nice (Jun 2017) · Read 2015 at Hammamet (Feb 2015)

05 Research Funding & International Projects

2018 – 2019 PHC-Utique NAMRED Project

Participant in the Franco-Tunisian research project *NAMRED* funded through the *Hubert Curien Partnership (PHC-Utique)* between **Université Côte d'Azur (France)** and the **University of Tunis El Manar (Tunisia)**.

The project promoted international scientific collaboration in applied mathematics and image processing through joint research activities, scientific exchanges, and researcher mobility programmes.

06 Teaching Overview

PERIOD	INSTITUTION	COURSES TAUGHT
2020–present	ESPRIT	Machine Learning · ML Optimization · Estimation Techniques · Numerical Analysis · Scientific Computing · Engineering Mathematics 1–4
2019–2020	ENSTAB	Integration & Probability · Numerical Analysis · Optimization
2018–2019	ENIT	MATLAB Initiation
2018–2019	ESPRIT	Engineering Mathematics I & II
2017–2018	ISBB	Applied Mathematics
2017–2018	ENIT	MATLAB Initiation
2015–2016	ISAMM	Numerical Analysis
2015–2016	ESPRIT	Engineering Mathematics



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ADMINISTRATIVE ROLE

Module Coordinator

Numerical Analysis & Scientific Computing
2022–2025

Teaching Team Leader

Coordinated a team of 21 instructors across multiple student groups

07 Research Supervision & Student Mentoring

Engineering Capstone Projects

- Supervised more than **20 final-year engineering projects** in Data Science, Artificial Intelligence, Machine Learning, and Computer Vision.

Project Team Leadership — Selected Projects

- Analysis and Prediction of Fraudulent Job Offers** — 2023 – 2024, ESPRIT, Tunisia
End-to-end analytical platform for detecting fraudulent job advertisements, covering web scraping, data preprocessing, machine learning modelling, and interactive Power BI dashboards.
- Analysis and Visualization of Road Traffic Accidents** — 2023 – 2024, ESPRIT, Tunisia
Complete data analytics solution using SQL Server for accident data management, statistical analysis, and interactive visualization.
- Mapping Seagrass Meadows with Satellite Imagery and Computer Vision** — 2024 – 2025, ESPRIT, Tunisia
Machine learning and computer vision techniques for the detection and spatio-temporal mapping of seagrass ecosystems from remote sensing data.
- ELBankeji: Multilingual Conversational Agent for the Tunisian Banking Sector** — 2024 – 2025, ESPRIT
Design and implementation of an AI-powered multilingual conversational agent tailored to banking services and customer support.
- Intelligent Medical Prescription Management Using Natural Language Processing** — 2025 – 2026, ESPRIT
Intelligent system for medical prescription processing and management based on modern NLP techniques.

08 Academic Leadership & Administrative Responsibilities

- Module Coordinator — Numerical Analysis & Scientific Computing** — 2022 – 2025, ESPRIT, Tunisia.
Responsible for curriculum planning, pedagogical coordination, assessment design, quality assurance, and continuous improvement of the module. Coordination of a Teaching Team of 21 Instructors

09 Editorial Activities

Reviewer for

- Journal of Algorithms & Computational Technology**, 2021.
- Journal of Applied Mathematics and Computing**, 2025
- Zeitschrift für Angewandte Mathematik und Physik**, 2025
- The Journal of Analysis**, 2026

10 Organisation of Scientific Events

- ENIT Doctoral Day** — May 19, 2017, ENIT, Tunisia.
Member of the organising committee for the annual doctoral event at ENIT.
- Rencontre Annuelle des Doctorants — READ 2017** — December 2–3, 2017, Hammamet, Tunisia.
Co-organiser of the annual doctoral meeting gathering researchers from LAMSIN.
- Apprentissage par Projets et par Problèmes (APP)** — September 6–9, 2022, ESPRIT, Tunisia.
Member of the organising team for this pedagogical event on project-based and problem-based learning.



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AT A GLANCE

10

Publications

2+

Under Review

10

Conferences

6+

Years Teaching

20+

Supervised
Engineering Projects

1

International
Research Project

11

Name Declaration

My name was officially changed from **Hamdi Houichet** to **Hamdi Braiek** following a judicial request. Per the ruling of the Tribunal de Mahdia dated August 30, 2022 (case no. 33217/2), my legal name is now Hamdi Braiek. Publications prior to 2022 may appear under the name *Houichet*.