

# Mehdi Ghrabli, PhD

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in Mehdi Ghrabli

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🏠 Massy, France

## Education

- 2023 – 2026 **PhD** in Applied Mathematics, ENS Paris-Saclay. *Under the supervision of Ludovic Chamoin, Emanuel Aldea, and Mounira Bouarroudj.*
  - Research in machine learning for predictive maintenance through time-series forecasting, surrogate modeling, and stochastic processes.
- 2021 – 2022 **Master MVA** (Mathématiques, vision, apprentissage), ENS Paris-Saclay. *Graduated with highest honors.*
- 2019 – 2022 **Engineering degree** Applied Mathematics, ENSTA Paris. Specialization in Optimization and Data Science. *Graduated with highest honors, 16.2/20 Grade.*
- 2017 – 2019 **Preparatory class** Mathematics and Physics, Institut préparatoire aux études d'ingénieurs Tunis (IPEIT).

## Professional experience

- 2023 **Freelance** Algorithmic trading based on a risk-return deep reinforcement learning algorithm.
  - Implemented a deep reinforcement learning agent for portfolio optimization, using a Markov decision process framework and recurrent neural networks to model financial time series.
- 2022 **Research internship** Data-driven quantization of neural networks, Datakalab.
  - Modified network architectures such as YOLO and ResNet at the layer level to reduce model size while maintaining high accuracy on CIFAR-10, ImageNet, and custom datasets.
- 2021 **Research internship** Statistical modeling for cross-platform audience estimation, CREST-ENSAE.
  - Modeled cross-media user behavior by developing and implementing Poisson-based latent class models.

## Awards and distinctions

- 2024 **Best Presentation Award** Doctoral Students' Day (SATIE), ENS Paris-Saclay, France.
- 2019 **Ranked First Nationwide** in the National Entrance Examination for Engineering Schools (Tunisia)
- 2017 **Ranked First in the Ben Arous Governorate** (Mathematics Specialization), Tunisian National Baccalaureate.

## Skills

- Programming **Python**
- ML/DL **PyTorch, TensorFlow, NumPy, Pandas, Tree-Based Models**
- Time-Series Modeling **Dynamic Time Warping, Autoregressive Models**
- Miscellaneous **Stochastic Processes, Probabilistic Modeling, Optimization, Statistics**

## Research publications

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### PhD Thesis

- 1 Ghrabli, M. (2026). *Data-efficient reliability assessment using machine learning: Application to lifetime estimation of power electronic modules* (Doctoral dissertation, Université Paris-Saclay).  
[doi:https://doi.org/10.70675/85666e15z1318z4b9bza0aezdee6ddf2bbdf](https://doi.org/10.70675/85666e15z1318z4b9bza0aezdee6ddf2bbdf)

### Journal Articles


- 1 Ghrabli, M., Aldea, E., Bouarroudj, M., & Chamoin, L. (2026). AI surrogate models for lifetime prediction in power electronic modules. *Microelectronics Reliability*, 180, 116102.  
[doi:https://doi.org/10.1016/j.microrel.2026.116102](https://doi.org/10.1016/j.microrel.2026.116102)
- 2 Ghrabli, M., Bouarroudj, M., Chamoin, L., & Aldea, E. (2025b). Physics-informed Markov chains for remaining useful life prediction of wire bonds in power electronic modules. *Microelectronics Reliability*, 167, 115644. [doi:https://doi.org/10.1016/j.microrel.2025.115644](https://doi.org/10.1016/j.microrel.2025.115644)

### Conference Proceedings

- 1 Ghrabli, M., Bouarroudj, M., Chamoin, L., & Aldea, E. (2025a, October). Data-driven Metamodels for Failure Analysis of Power Electronic Modules. In *Proceedings of the 36th European Symposium on Reliability of Electron Devices, Failure Physics and Analysis (ESREF 2025)*. Université de Bordeaux, ADERA, Bordeaux, France. Retrieved from <https://hal.science/hal-05323091>
- 2 Ghrabli, M., Bouarroudj, M., Chamoin, L., & Aldea, E. (2024). Hybrid modeling for remaining useful life prediction in power module prognosis. In *Proceedings of the 25th International Conference on Thermal, Mechanical and Multi-Physics Simulation and Experiments in Microelectronics and Microsystems (EuroSimE)* (pp. 1–9). [doi:10.1109/EuroSimE60745.2024.10491493](https://doi.org/10.1109/EuroSimE60745.2024.10491493)


## Teaching experience

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2023-2024  **Teaching assistant** Mathematical & numerical tools for management, IUT de Sceaux, Université Paris-Saclay

## Activities and training


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2022  **Competitive Programming** Ranked 34 out of 97 in the competitive programming competition SWERC (South Western Europe Regional Contest).


2016  **National Math Olympiad Selection** Top 20 nationwide in the Tunisian Association of Mathematics (ATSM) competitive exam, securing a spot in the intensive training bootcamp for International Mathematical Olympiad preparation.

## Languages

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Arabic  Native

English  Professional working proficiency: 985/990 TOEIC score

French  Professional working proficiency