

Machine learning researcher and engineer

SKILLS

- **Tech:** Python (Tensorflow, PyTorch, Transformers, Optuna, scikit-learn, Pandas), C, Matlab, Linux, Git, Docker, AWS
- **Communication:** French (native), English (fluent), Japanese (business level – JLPT N2)

PROFESSIONAL EXPERIENCE

- Algorithm researcher, Brainomix** (United Kingdom, Oxford) Dec 2022–current
- Developed and productized an explainable machine-learning respiratory phase classification algorithm (with **scikit-learn**) using features derived from shape analysis of deep learning-based trachea and lung segmentations in chest CT scans
 - Conducted survival analysis (Cox proportional hazards models, random survival forests) to gain insights on lung segmentation and biomarker reliability and improve CI/ML testing infrastructure
 - Improved trachea and lung segmentation via postprocessing with a level-set-based method
 - Explored advanced denoising algorithms (e.g., guided filtering) to enhance airways segmentation robustness
- Visiting researcher, Sony Computer Science Laboratories** (Tokyo, part-time, remote) June–Nov 2022
- Developed a method inspired by the optical-flow algorithm to estimate time-varying loadings in security factor models and trained a VAE in **Keras** to learn and visualize low-dimensional fund exposure embeddings (from per-stock active weights and loadings) to support GPIF
 - Researched NLP algorithms (Naive Bayes, linear regression with TF-IDF features, LSTMs with GloVe embeddings, BERT, and MPNet) for fake news detection (69.8% accuracy on a dataset of 480 articles), ESG risk score regression (RMSE of 3.0 for scores ≤ 18.5 on a dataset of 77 reports), and evaluation of fund report alignment with ESG criteria, to support Nomura Asset Management (tech: **Tensorflow, PyTorch**)
 - Designed a deep learning- and linear algebra-based NLP method to detect greenwashing, comparing internal sustainability reports and news
- Computer vision research intern, Idemia (formerly Safran Morpho), Research and Technology Unit** (France, Ile-de-France) Apr–Sept 2016
- Prototyped an end-to-end OCR pipeline in **C** for degraded text images (over-segmentation, character recognition, shortest-path graph decoding using Viterbi's algorithm to select the most likely string) that achieved 13.4% higher accuracy than Tesseract 3.04 (open-source software)
 - Designed and evaluated a character over-segmentation (candidate cut generation) method based on Dijkstra's algorithm, by modeling the image as a graph (with pixels as nodes and weights derived from intensities and heuristics), and optimized speed using a binary-search-style strategy
 - Implemented from scratch a character-level neural network classifier (~50k parameters) as part of the OCR pipeline, and trained it on a dataset of ~20k synthetic character images; improved recognition accuracy by ~5% by incorporating a class-conditional Bayesian aspect-ratio prior
- Physics research intern, Schlumberger, Engineering department** (Japan, Kanagawa) Jan–Feb 2014 and June–Aug 2014
- Modeled fluid flow with PDEs and estimated parameters with **Matlab** to assess non-contact vibration-sensor feasibility for reservoir evaluation

EDUCATION

- M.Sc. / Ph.D. in Bioengineering, The University of Tokyo** (Japan) Sept 2016–Sept 2021
- Proposed implementations of online training algorithms for RNNs with improved accuracy and complexity (in **Matlab**), applied them to marker position forecasting for latency compensation in radiotherapy, and achieved competitive results relative to prior deep learning approaches
 - Developed a modular and interpretable forecasting algorithm for chest and liver MR image sequences based on motion modeling with PCA and temporal dynamics prediction with RNNs and transformer encoders (in **PyTorch**) for MR-guided radiotherapy
 - Published 4 articles in Q1 computer science journals and 1 blog article selected as an Editors' Pick in Towards Data Science; the 2 most recent academic articles include extensions with additional algorithms, datasets, and experimental results as part of independent research (2022–2026)
 - Presented my research at 12 conferences in Japan (where I won 2 prizes), one workshop at Seoul National University, and in 1 YouTube video with ~ 450k views
 - Took 6 elective courses in algorithms, statistics, machine learning, and computer vision
- Additional coursework** (M.Sc. in Mathematics—1st year), **Aix-Marseille Université** (France, distance learning) 2017–2019
- Coursework in probability theory, parametric and non-parametric statistics, stochastic processes, partial differential equations...
- M.Sc. in Engineering** ("Diplôme d'ingénieur"), **Centrale Lille** (France) 2013–2016
- Implemented a classifier for graph-structured data based on a generalized likelihood-ratio test and Fourier graph transforms, and applied it to Alzheimer's disease diagnosis from PET images by modeling brain regions as graph nodes (3-month project at Fresnel Institute, tech: **Matlab**)
 - Built and programmed autonomous robots for the 2015 French robotics contest (2-year project with 5 other students, tech: Arduino, **C**)
- Joint M.Sc.(Res) in Signal and Image Processing, Centrale Marseille** (France), Valedictorian award (video in French) 2015–2016
- Research-oriented program in AI and computer vision: Bayesian statistics, wavelet analysis, Markov models, segmentation, image restoration...
- B.Sc. in Mathematics, Physics and Computer Science** ("Classes préparatoires"), **Lycée Louis-le-Grand**, (France) 2010–2013
- Highly selective undergraduate science program preparing for nationwide competitive examinations for entry to the best French universities

SCHOLARSHIPS, GRANTS, AND AWARDS

- Sept 2018–Sept 2021 : The University of Tokyo Doctoral Student Special Incentives Program (**SEUT-RA**)
- Sept 2019–Sept 2020 : SEUT-RA Type A (top 20 applicants in the 2nd year of the Ph.D. program at the Graduate School of Engineering)
- April 2019–April 2021 : scholarship from the Epson International Scholarship Foundation
- March 2018 & March 2019: idea prize and encouragement prize (annual meeting and students' meeting of the Atomic Energy Society of Japan)
- Sept 2016–March 2017 and Sept 2017–March 2018 : JASSO Honors Scholarship for Privately-Financed International Students