Thiziri NAIT SAADA

Gender: Female; Nationality: French; Language: English, French;
Expected Graduation Date: 08/25
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Education

Mathematical Institute, University of Oxford, UK. — *Oct. 2021 - Apr. 2025*
Doctor of Philosophy
PhD in Applied Mathematics/Machine Learning under the supervision of Prof. Jared Tanner.

École Normale Supérieure (ENS) Paris-Saclay, France. — *Sept. 2020 - Oct. 2021*
MVA Mathématiques, Vision, Apprentissage - English-language curriculum
Master by Research with major in Applied Mathematics (Convex Optimisation, Computational Optimal Transport, Statistical Learning, Probabilistic Graphical Models, Numerical Images, Deep Learning, Computational Statistics, Graphs in Machine Learning, Kernel Methods, Sequential Learning, Parsimonious Representations, Random Matrix Theory, Introduction to Medical Image Analysis.)

Telecom Paris, Paris, France. — *Sept. 2018 - Sept. 2021*
French Engineering "Grande École" - English-language curriculum
Top ranked French Engineering school in Computer Science and Applied Mathematics Master's degree with major in Statistics and Data Science.

Lycée Henri-IV and Saint-Louis, Paris, France. — *Sept. 2016 - June 2018*
Scientific Preparatory Classes
Undergraduate intensive courses in Advanced Mathematics, Physics and Engineering Sciences, preparing for admission to French Engineering Grandes Écoles.

Research experience

Research internship in Computer Vision, Owkin, London, UK. — *Jul.-Dec. 2023*
Developed Multiple Instance Learning models based on Graph Neural Networks and Transformers for Survival Analysis and Cancer classification on Whole-Slide histopathology images.

Research collaboration on disentangled manifold learning — *Since May 2023*
Developing some contrastive learning methods to learn a manifold factorisation from samples, based on Disentangling by Subspace diffusion, Pfau D. et al., 2020 under the supervision of David Pfau.

Optimal Transport on Gaussian mixtures, Paris Descartes, France. — *Apr.-Sept. 2021*
Research internship supervised by Prof. Julie Delon and Prof. Nicolas Courty, in MAP5 Lab.
Introduced and implemented a regularized OT distance, whose transport plan is a factored coupling with Gaussian Mixtures anchors, based on Forrow A. et al., 2018 and using the Sinkhorn-EM algorithm.

Machine Learning inference on biomolecules, Inria, France. — *Sept. 2019 - 2020*
Research project supervised by Prof. F. Cazals. Used Machine Learning techniques to study the tryptic structure-dynamics-function of biomolecules. Performed a careful bibliographical study of four interdisciplinary complementary papers at the intersection of Machine Learning and Computational Biology.

Teaching experience

College Lecturer, Probability, Hertford College, Oxford, UK. — *Since Oct. 2022*
Tutoring 2nd year undergraduate students, marking their problem sheets and presenting solutions. In charge for admission interviews for undergraduates in Mathematics.

Tutor, Deep Learning Theories, Mathematical Institute, Oxford, UK. — *Since Oct. 2022*
Tutoring 4th year undergraduate students and presenting solutions to their problem sheets, including proofs and implementation in Python (TensorFlow, Keras & PyTorch).

Tutor, Optimization, Mathematical Institute, Oxford, UK. — *Since Jan. 2022*
Tutoring 3rd year undergraduate students and marking their problem sheets of the Optimization for Data Science course (B6.2, Hilary term).

Mathematics Oral Assessor, Lycée Chaptal, Paris, France. — *Sept. 2018 - 2021*
Taught Advanced Mathematics (Analysis, Linear Algebra and Probability) to students in Preparatory Classes for 2 hours a week. Provided a weekly guidance to students preparing for oral entrance exams.

Publications

Naderi, A.*, **Nait Saada, T.***, Tanner, J. (2024). Mind the Gap: a Spectral Analysis of Rank Collapse and Signal Propagation in Transformers.
Under review — arXiv

Nait Saada, T.*, Naderi, A.* (2024). A simple proof for the almost sure convergence of the largest singular value of a product of Gaussian matrices.
Under review — arXiv

Nait Saada, T.*, Di-Proietto, V.*, Schmauch, B., Fidon, L. (2023). CARMIL: Context-Aware Regularization on Multiple Instance Learning models for Whole Slide Images.
International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) Workshop COMPAYL, 2024 — arXiv

Nait Saada, T., Naderi, A., Tanner, J. (2023). Beyond IID weights: sparse and low-rank deep Neural Networks are also Gaussian Processes.
In Proceedings of International Conference on Learning Representations (ICLR), 2024 — arXiv

Nait Saada, T., Tanner, J. (2023). On the Initialisation of Wide Low-Rank Feedforward Neural Networks.
Under review — arXiv

Grants

EPSRC — Studentship (2021).

RATP "Trajets d'avenir" — Scholarship (2020) awarded based on social and academic merit.

"Ingénieuses 2021" — Scholarship (2020), selected from a nationwide pool of female scientific candidates.

Coding skills

Python — Proficient (Pytorch, Tensorflow, Multi GPU).

Java — Proficient.

Github — Proficient.