Guillem HURAULT | Data Science Specialist

London SW6 - UK

Engineer and graduating PhD researcher in Statistical Machine Learning for medical applications with 5 years of experience in data science. Deep expertise in Bayesian modelling and time-series forecasting. Highly proficient with the R statistical programming language and conscious about reproducible coding practices. Hands-on experience in managing research projects. Looking to apply my skills to business applications.

Education Education

2018-2022	PhD in Statistical Machine Learning, Department of Bioengineering, Imperial College London, UK
	Thesis: Towards a data-driven personalised management of Atopic Dermatitis severity. Supervisor: Dr. Tanaka.

- 2016–2017 MSc in Biomedical Engineering, Neurotechnology, Imperial College London, UK, Distinction
- 2014–2018 Master's Degree in Engineering, Ecole Centrale de Lyon, one of France's top engineering schools
- 2014–2016 Bachelor's Degree in Economics, Université Lyon 2, France
- 2012-2014 Intensive preparation in Maths and Physics (MPSI, MP*) for the highly competitive entrance exams to the French "Grandes Écoles" at *Lycée Chateaubriand*, Rennes (France).

Professional Experience

October 2017 Research Assistant, Department of Bioengineering, Imperial College London, UK

- Today Pioneered research on eczema for 1) detecting and assessing eczema in camera images using CNN, 2) predicting the evolution of eczema severity, 3) generating personalised treatment recommendations.
 - Analysed real-world and clinical trial patient data with state-of-the-art Bayesian models for time-series forecasting.
 - Published 10+ scientific articles to clinical and machine learning audiences. Presented work at international conferences. Reviewed several research papers.
 - Developed software packages (EczemaPred, HuraultMisc) and high-quality analysis code following agile and reproducible research practices (version control, documentation, testing, continuous integration).
 - Supervised 25+ student projects on topics like statistical modelling, computer vision, clustering, Gaussian Processes.
 - Designed and managed our external website, knowledge base and code repositories (GitHub). Set up standard operating procedures for writing and sharing code.
- 2019 2021 **Teaching Assistant**, Department of Bioengineering, Imperial College London, UK, part-time
 - Probability & Statistics Mathematics Occasional teaching in Machine Learning and Brain Machine Interfaces.
- May 2016 Research Intern, Laboratoire de Neurosciences Cognitives (CNRS UMR 7291), Aix-Marseille Université, France
- -July 2016 Analysed fMRI images using Machine Learning to understand the role of the oculomotor cortex in social perception.

Skills

Languages • Native French • Fluent English • Basic Portuguese

Data Science • Machine Learning • Statistics • Bayesian modelling • Time-series forecasting • Uncertainty quantification

• Visualisation • Missing values • Regularisation • Decision-making • Clustering • Causality

Programming Working knowledge: ○ R (incl. tidyverse, Shiny, package development) ○ Stan ○ MATLAB

• MTFX • RegEx • Git/GitHub

Basic knowledge: • Python • SQL • C# (incl. Infer.NET) • HTML • Tableau

Software OMicrosoft Office (incl. Publisher) OMicrosoft Visual Studio OAdobe Premiere OGimp

Other Experiences

2019 - 2021 Bioengineering PhD representative, Imperial College London

Represented 200+ PhD researchers in departmental meetings, organised social and professional events.

2014-2017 Engineering student

- Investigated the evolution of eczema using Machine Learning methods in the Biological Control Systems Lab.
- Designed a genetic algorithm in a research project with LIRIS Lab (CNRS) to solve a scheduling problem.
- Supervised a 6-person team for HEXADRONE to design and test a security system to avoid the crash of a drone.

2015 General Secretary, Forum Perspectives

Organized a yearly career fair with 100 companies, 2000 students participating and a turnover of 250k€.

- 2015 **Treasurer, Communication coordinator and Editor** of Centrale Lyon's newspaper Piston Hebdo.
- 2015 Active committee member of Centrale Lyon's Cinema Society.

Publications

- [1] **G. Hurault**, J-F Stalder, S. Mery, A. Delarue, M. Saint Aroma, G. Josse and R. J. Tanaka, "EczemaPred: A computational framework for personalised prediction of eczema severity dynamics", *Clinical and Translational Allergy*, 2022, vol. 12, no. 3, p. e12140.
- [2] **G. Hurault**, K. Pan, R. Mokhtari, B. Olabi, E. Earp, L. Steele, H. C. Williams and R. J. Tanaka, "Detecting eczema areas in digital images: an impossible task?", *MedRxiv*.
- [3] **G. Hurault**, E. Roekevisch, M.E. Schram, K. Szegedi, S. Kezic, M.A. Middelkamp-Hup, P.I. Spuls and R. J. Tanaka, "Can serum biomarkers predict the outcome of systemic immunosuppressive therapy in adult atopic dermatitis patients?", *Skin and Health Disease*, vol. 2, no. 1, p. e77, 2022.
- [4] **G. Hurault**, V. Delorieux, Y-M. Kim, K. Ahn, H. C. Williams and R. J. Tanaka, "Impact of environmental factors in predicting daily severity scores of atopic dermatitis", *Clinical and Translational Allergy*, vol. 11, no. 2, 2021.
- [5] J. G. Holm, **G. Hurault**, T. Agner, M.L. Clausen, S. Kezic, R. J. Tanaka, S. F. Thomsen, "Immunoinflammatory Biomarkers in Serum Are Associated with Disease Severity in Atopic Dermatitis", *Dermatology*, vol. 237, no. 4, pp. 513–520, 2021.
- [6] R. Jurakic Toncic, I. Jakasa, Y. Sun, **G. Hurault**, S. Ljubojevic Hadzavdic, R. J. Tanaka, B. Pavicic, A. Balic, K. Zuzul, M. Petkovic, S. Kezic and B. Marinovic, "Stratum corneum markers of innate and T helper cell-related immunity and their relation to the disease severity in Croatian patients with atopic dermatitis", *Journal of the European Academy of Dermatology & Venereology*, vol. 35, no. 5, pp. 1186–1196, 2021.
- [7] K. Pan, **G. Hurault**, K. Arulkumaran, H. C. Williams and R. J. Tanaka, "EczemaNet: Automating Detection and Assessment of Atopic Dermatitis", *International Workshop on Machine Learning in Medical Imaging*, 2020.
- [8] **G. Hurault**, E. Domínguez-Hüttinger, S. M. Langan, H. C. Williams and R. J. Tanaka, "Personalised prediction of daily eczema severity scores using a mechanistic machine learning model", *Clinical & Experimental Allergy*, vol. 50, no. 11, pp. 1258–1266, 2020.
- [9] J. Nousbeck, M.A. McAleer, **G. Hurault**, E. Kenny, K. Harte, S. Kezic, R. J. Tanaka and A.D. Irvine, "miRNA analysis of Childhood Atopic Dermatitis reveals a role for miR-451a" *British Journal of Dermatology*, vol. 184, no. 3, pp. 514–523, 2020.
- [10] M.A. McAleer, I. Jakasa, **G. Hurault**, P. Sarvari, W. H. I. McLean, R. J. Tanaka, S. Kezic and A. D. Irvine, "Systemic and stratum corneum biomarkers of severity in infant AD include markers of innate and Th-related immunity and angiogenesis", *British Journal of Dermatology*, vol. 180, no. 3, pp. 586–596, 2019.
- [11] **G. Hurault**, M. Schram, E. Roekevisch, P. I. Spuls and R. J. Tanaka, "Relationship and probabilistic stratification of EASI and oSCORAD severity scores for atopic dermatitis", *British Journal of Dermatology*, vol. 179, no. 4, pp. 1003-1005, 2018.

Public speaking

- [1] "Computational tools for data-driven personalised medicine for Atopic Dermatitis", poster presented at the International Symposium on Atopic Dermatitis, 2021
- [2] "A Bayesian Hidden Markov model to predict the dynamic evolution of disease severity in eczema", poster presented at the International Conference on Systems Biology of Human Diseases, 2019
- [3] "Bayesian Modelling to Predict the Evolution of Eczema Severity", poster presented at the International Conference on Systems Biology, 2018.
- [4] "Bayesian Machine Learning to Predict Short-term Course of Eczema Severity", presented at BioMedEng18, 2018
- 5] "Predicting short- and long-term outcomes of a systemic therapy for atopic dermatitis using machine learning methods", presented at the International Symposium on Atopic Dermatitis, 2018
- [6] "How can Machine Learning help our understanding of Atopic Dermatitis?", presented at the London Skin Club, 2017